EFFECTS OF INSTRUCTING CAREGivers IN A SHARED BOOK READING INTERVENTION AND COROLLARY CHANGES IN COMMUNICATIVE BEHAVIORS OF YOUNG CHILDREN WITH SIGNIFICANT DEVELOPMENTAL DELAYS

By

ANN-MARIE DALRYMPLE ORLANDO

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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To all the parents of children with significant disabilities for all the hard work they do to make their children's lives better
ACKNOWLEDGMENTS

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LIST OF DEFINITIONS

Caregiver
A caregiver is the primary caregiver of the child and could be, but was not limited to, a child’s biological parent, grandparent, stepparent, relative, or adoptive parent.

Caregiver-implemented
Caregivers are instructed to use strategies within the context of caregiver and child reciprocal interactions such as shared book reading for the purpose of facilitating the child’s communicative behaviors (Girolametto, 1988).

Communication
“Any act in which a person exchanges information with another person about his/her needs, desires, perceptions, knowledge, or effective states. Communication may be intentional signals, conventional or unconventional forms, linguistic or nonlinguistic forms, and may occur through spoken or other modes” (National Joint Committee for the Communication Needs of Persons with Severe Disabilities, 1992, p. 3).

Communicative form
The topography of a communication act (McLean, Brady, McLean, & Behrens, 1999). The method an individual uses to exchange information with others. The form can be nonsymbolic (such as a gesture) or symbolic (such as a picture or speech).

Communicative function
The intent or purpose for communication directed at a listener to comment, request, protest, greet, label, confirm/reject, or show affection (Rowland, 2009).

Contingent responsiveness
Verbal or nonverbal response given by the caregiver to the child regarding an object on which the child is focused or a response given after the child has shifted attention to a desired object. (e.g., the caregiver labels an object only after the child has shifted gaze to the object) (Paparella & Kasari, 2004).

Emergent literacy
A term used to describe the reading and writing knowledge children acquire before formal instruction in literacy (Clay, 1972; Teale & Sulzby, 1986). Knowledge about reading and writing includes: concepts about print, alphabet knowledge, phonological awareness, vocabulary knowledge, letter naming, and word manipulation (Bus, van Ijzendoorn, & Pellegrini, 2000; NELP, 2008).

Joint attention
The ability of a person to regulate attention between an object and another person (Rocha, Schreibman, & Stahmer, 2007).
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<th>Non-symbolic communicative behaviors that include: reaching, leading, gestures, facial expressions, body movements, eye gaze, and vocalizations (Sigafoos, Drasgow, Reichle, O’Reilly, &amp; Tait, 2004).</th>
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<td>Proto-declaratives</td>
<td>Requests made with the intent to show or share about an object or event but not with the intent to request an object or action from the communication partner (Yoder, Warren, &amp; McCathren, 1998).</td>
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<td>Shared book reading</td>
<td>A socially and contextually supportive and naturally occurring activity caregivers engage in with their children with joint attention to reading material (Crain-Thoreson &amp; Dale, 1999). This is different from dialogic reading which is a researched strategy where an adult engages in shared book reading with a child with the intent to teach language using specific techniques such as asking questions and giving feedback while adjusting for their child’s developmental level (Whitehurst et al., 1988).</td>
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<td>Children with significant disabilities comprise a heterogeneous population with a variety of characteristics that vary in type, degree, strengths, limitations, and need for support (Sigafoos et al., 2004). Characteristics include: 1) severe speech and language impairment; 2) reduced physical mobility; 3) reduced and slower rate of learning; 4) difficulty generalizing information to different contexts; or 5) a need for support in one or more activities of daily living (e.g., domestic, leisure, community, and play) (NICHCY, 2004).</td>
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<td>Children within the age range of birth to 36 months.</td>
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<td>Young children with significant developmental delays</td>
<td>Children age birth to 36 months who are functioning at least 50% below their chronological age in two or more of the following developmental domains: communication, motor, social/emotional, adaptive, or cognitive.</td>
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EFFECTS OF INSTRUCTING CAREGIVERS IN A SHARED BOOK READING INTERVENTION AND COROLLARY CHANGES IN COMMUNICATIVE BEHAVIORS OF YOUNG CHILDREN WITH SIGNIFICANT DEVELOPMENTAL DELAYS

By

Ann-Marie Dalrymple Orlando

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Chair: Diane Lea Ryndak
Major: Special Education

Effects of instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) on the caregivers’ use of initial and follow-up prompting strategies and corollary changes in their children’s use of communicative forms and functions during shared book reading sessions was examined using a multiple probe multiple baseline research design across participants. The instruction targeted the caregivers’ implementation of setting the environment to facilitate communication and prompting strategies in the context of shared book reading. To determine their use of the intervention, video recorded shared book reading sessions of caregivers reading with their children at home were observed and coded for the caregivers’ use of the intervention and their children’s use of communicative forms and functions. The results suggest that caregivers increased their use of most of the prompting strategies during shared book reading and generally maintained their use during follow-up sessions. Correspondingly, corollary changes generally were observed in their children’s use of
communicative forms and functions. Maintenance of the children’s use of communicative forms and functions was limited to two of the three child participants.
CHAPTER 1
INTRODUCTION

The purpose of this chapter is to provide a rationale for the need to examine the effects of instructing caregivers in shared book reading interventions (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) on the caregivers’ use of initial and follow-up prompting strategies with their young children with significant developmental delays and corollary changes in their children’s communicative forms and functions. To accomplish this, the chapter has eight main sections. The first section addresses one population of interest for the present study – young children age 18 to 34 months with significant developmental delays. These young children are characterized in accordance with International Classification of Functioning, Disability, and Health (ICF) of the World Health Organization (WHO, 2011) by their common functional abilities rather than a common diagnosis. In the second section, the communicative behaviors of communicative form and function are defined. In the third section emergent literacy and its relevance for children at risk are described. The fourth section addresses the second population of interest for the present study – caregivers. It defines caregivers and the term caregiver-implemented, and explains the relevance of caregiver-implemented interventions to young children age birth to 36 months of age with developmental disabilities. A statement of problems related to the research on caregiver-implemented shared book reading interventions for children with disabilities is presented in the fifth section. In sections six and seven the significance and purpose of the study are detailed. This chapter concludes with the delimitations and limitations of the study.
Young Children with Significant Developmental Delays

There are two populations of interest for the study -- young children with disabilities and their caregivers. In relation to the young children with disabilities, the present study specifically focuses on children age 18 to 34 months with significant developmental delays. For the present study, the term significant developmental delay is used to describe children (18 to 34 months) who are identified with disabilities and have functional limitations in communication and at least one other developmental domain (e.g., cognitive, motor, adaptive) (Newborg, 2005). This is a heterogeneous population that exhibits a variety of characteristics that vary in type, degree, strengths, limitations, and support needs (Sigafoos, Drasgow, Reichle, O’Reilly, Green, & Tait, 2004). Regardless of their characteristics, young children (i.e., birth to 36 months) with developmental delays are defined by their state’s criteria and were granted the right to early intervention services through the passage of Public Law 99-457 in 1986 (EHA, 1986) (Simeonsson, Scarborough & Hebbeler, 2006). Public Law 99-457 was a reauthorization of the Education of All Handicapped Children Act (EHA; PL 94-142), which was edited to include the early intervention amendments. Part B of the law extended to children 3 to 5 years of age with disabilities the same right to a free and appropriate public education that had been mandated for children ages 6 to 21 years in the original EHA (PL 94-142), and allowed states 5 years (1986 to 1991) to develop programs to serve children 3 to 5 years of age.

The same reauthorization of the EHA also established Part H, which now is known as Part C of the Individuals with Disabilities Education Act (IDEA). Part C mandates early intervention services for infants and toddlers who have a substantial delay in one or more developmental domains (i.e., adaptive behavior, cognition, communication,
social or emotional, or physical/motor), an established medical condition, or factors that put them at significant risk for manifesting a developmental delay (Florida Department of Health Children’s Medical Services, 2010). Like Part B, Part H also allowed states 5 years (1986 to 1991) to develop a comprehensive coordinated system that incorporated three required components for serving infants and toddlers with disabilities or developmental delays: (a) multidisciplinary assessments, (b) individualized family service plans (IFSP's), and (c) service coordination (NICHCY, 1996). These three components were the precursors to 13 required components of the new policies for serving infants and toddlers with disabilities or developmental delays (Early Intervention Program for Infants and Toddlers with Disabilities, 2011). With a subsequent reauthorization of the EHA in 1990, the law was renamed the Individuals with Disabilities Education Act. In a subsequent reauthorization of IDEA in 1994, Part H (the Early Intervention Program for Infants and Toddlers with Disabilities) was renamed Part C of IDEA.

The most recent national data available reported that in 2007, 2.4% of the total population of children age birth to 3 years in the United States (i.e., 293,816 young children) received early intervention services through Part C of IDEA (OSEP, 2007). For many young children, the earliest indicator of a developmental delay often is a delay in the ability to communicate effectively. According to the National Early Intervention Longitudinal Study (NEILS), 41% of children birth to 3 years of age who have disabilities and are eligible for early intervention services received services for communication impairments (Hebbeler et al., 2007). Consistent with the NEILS data, the U.S. Department of Education Office of Special Education Programs (OSEP, 2007) reported
that 46.4% of 3 to 5 year old children with disabilities were identified with communication impairments.

The number of young children eligible for Part C services varies across states because the states vary in the eligibility criteria and language used to categorize and describe children’s levels of functioning (Simeonsson et al., 2006). With the aim of establishing a common language of function and disability, the International Classification of Functioning, Disability, and Health (ICF) of the World Health Organization (WHO, 2011) has identified components of human functioning. These components consist of: (a) body functions and structures, (b) activities, and (c) participation. Using these components to profile an individual’s abilities, a more accurate functional description of an individual emerges, as well as a picture of how that individual can interact within his/her environment.

The ICF (WHO, 2011) uses the term disability to refer broadly to conditions that interfere with the components of human functioning (i.e., impairments, activity limitations, and participation restrictions). It recognizes that children with disabilities share common characteristics depending on the type and degree of their functional abilities and conditions that interfere with their functioning abilities, rather than their common diagnoses (WHO, 2011). Thus, though children might share significant limitations in communication functional abilities, they might not have the same diagnosis.

The ICF model of disability is a biopsychosocial model because it is based on the interaction between the health condition of an individual and social contexts. This is different from a medical model of disability because it does not view disability as a
problem with an individual that needs to be repaired. The ICF model also does not view
disability as a purely socially constructed problem that needs only environmental
accommodations. Viewing disability at the level of interaction between an individual’s
health condition and social contexts is useful, particularly in intervention (WHO, 2011).
In this view of disability, interventions can focus on increasing an individual’s functional
ability within social contexts, and environmental arrangements can accommodate the
individual’s health condition. For example, for children with significant communication
impairments secondary to a health condition of autism or cerebral palsy, the same
interventions might be used in social contexts because the children share the same
limitation, although their health conditions are different. In addition, addressing
communication limitations within social contexts focuses on performance within the
actual contexts to increase a child’s functional ability. Based on this view of disability,
one of the populations of interest for the present study is young children with a common
limitation in their functional abilities (i.e., communication and at least one other
functional ability domain), rather than children with a common diagnosis such as autism
or cerebral palsy.

**Communicative Form and Function**

Communication is the exchange of ideas or information through a mutually
understood symbol system. The most commonly used symbol system is words, either
spoken or written. “Typically, by their second birthday, children use and understand
hundreds of words, construct sentences, and engage in simple conversations, although
there is wide variability in their language skills” (Wetherby, Goldstein, Cleary, Allen, &
Kublin, 2003, p. 162). The development of communicative behaviors often is a chief
concern for caregivers and service providers of children birth to 36 months of age who
have disabilities, specifically significant developmental delays. These children might have difficulty developing communicative behaviors that allow them to exchange information with others efficiently and effectively (Romski & Sevcik, 2005). Such impairments in communication affect the way young children exchange information with others and how their communication is interpreted by others.

For the present study, the communicative behaviors of interest are communicative forms and communicative functions. The term communicative form refers to the modes used to exchange information, including facial expressions, gestures, and speech. Before learning to speak young children use communicative forms such as eye contact, crying, facial expressions, and gestures. When communicating, these communicative forms fulfill a communicative function. For example, a communicative function associated with a communicative form could be a request, comment, command, question, response, or protest (Rescorla & Mirak, 1997). At early stages of development, caregivers interpret their young children’s communicative form as serving specific contextually based communicative functions. For example, caregivers might interpret eye contact as a response, crying as a request for food, or pointing as a comment on an object in the environment.

Knowledge the caregivers have regarding content and context of prior shared events in their children’s lives helps them to interpret the function of their children’s communicative forms in a current shared event. When caregivers and children jointly attend to a shared event, it is possible for caregivers to interpret their children’s communication. Initially, these events usually are activities that are repeated daily (e.g., bathing, reading, playing). Caregivers’ knowledge of prior events, and knowledge of
their child’s communicative forms and functions, creates predictability in the current event. The repetition of events, predictable contexts, and use of communicative forms and functions leads to understanding by the communication partner. For this reason, caregivers’ early communication with their young children usually refers to objects present and events occurring at the time of the interaction (deVilliers & deVilliers, 1979). This is known as contextualized communication. It is possible, however, to comprehend decontextualized communication with a familiar communication partner. Over time, it also is possible for unfamiliar communication partners to understand decontextualized communication as children’s communicative forms are paired and shaped into more conventional forms of communication (i.e., speech).

Young children with significant developmental delays in communication might not demonstrate communicative forms in ways similar to their same-age peers without developmental delays. For example, children with motor and visual impairments might not comment on, request, or respond to an object in the environment by pointing. Therefore, their attempts to communicate or exchange information with another person might not be as effective as attempts by children who comment on, request, or respond to objects in their environment by pointing. For young children who have difficulty communicating, caregivers are integral to creating shared contexts and providing supports that assist their children in developing communication.

**Emergent Literacy**

*Emergent literacy* is a term used to describe the early knowledge of literacy children acquire before formal instruction in literacy (Clay, 1972; Teale & Sulzby, 1986). The emergent literacy perspective is broad and defines literacy as acts of reading, writing, listening, and speaking that develop concurrently and interrelatedly.
Early knowledge about literacy (i.e., acts of reading, writing, listening, and speaking) reflects an emergent group of concepts about print, alphabet knowledge, phonological awareness, vocabulary knowledge, letter naming, and word manipulation (Bus, van Ijzendoorn, & Pellegrini, 2000; National Early Literacy Panel [NELP], 2008). This early knowledge about literacy has been shown to be the foundation for later (i.e., conventional) literacy skills (Justice & Pullen, 2003). Emergent literacy develops through exposure to literacy, early literacy experiences, and modeling of both reading and writing by caregivers.

Kindergarteners who develop typically, come from middle-class homes, and are exposed to literacy in their homes from birth enter school with more than 1,000 hours of early literacy experiences (Cunningham & Allington, 1999). Children, age 3 to 5 years old, who do not have exposure to literacy, early literacy experiences, and caregivers who model both reading and writing are at risk for entering kindergarten without a strong foundation in emergent literacy (Whitehurst & Lonigan, 1998). These children frequently have one or more of the following risk factors: (a) caregivers with low socioeconomic status, (b) families who are English language learners, (c) caregivers with a history of reading difficulties, (d) special health care needs, and (e) disabilities (Justice & Pullen, 2003). In the past few decades, several studies have focused on early literacy experiences for children who are at risk for entering kindergarten without a strong foundation in emergent literacy. Studies have shown that in comparison with children who do not have these risk factors, children who are at risk generally engage in shared book reading less frequently with their caregivers and have fewer community literacy experiences such as going to the library (Hockenberger, Goldstein, & Haas, 1999).
Studies focused on children with disabilities, in particular, found that their caregivers viewed goals focused on emergent literacy as a lower priority than goals focused on communication or self-help skills (Marvin, 1994; Marvin & Mirenda, 1993). In addition, the types of commenting and questioning that caregivers used during shared book reading with their children with disabilities, and the use of technology to access literacy, were different from those used by caregivers of children without any risk factors (Al Otaiba, Lewis, Whalon, Dyrund, & McKenzie, 2009; Light & Kelford-Smith, 1993; Marvin, 1994; Marvin & Mirenda, 1993; Marvin & Wright, 1997; Stobbart & Alant, 2008; Weikle & Hadadian, 2004). Because differences have been found in the early literacy experiences between children with disabilities and children without risk factors, studies have focused on interventions to increase these experiences.

Contexts that are rich in early literacy experiences have been shown to increase children’s vocabulary skills (Ninio, 1983) and use of language (Ninio & Bruner, 1976). Several studies have focused on interventions for children 3 to 5 years old with disabilities implemented during early literacy experiences. These studies investigated which early literacy experiences had the strongest relationships to later (i.e., conventional) reading skills, communication, shared book reading participation, and phonological awareness (Justice & Pullen, 2003). Studies also demonstrated that implementation of interventions focused on emergent literacy resulted in improved oral and written language skills for both typically developing children and children at risk, including children with disabilities (Koppenhaver, Evans, & Yoder, 1991; Senechal, LeFevre, Thomas, & Daley, 1998).
Caregivers and Caregiver-Implemented Interventions

The second population of interest for the present study was caregivers. Researchers have examined caregivers’ use of interventions focused on communication delivered during shared book reading with children who have disabilities. They found that the use of caregiver-implemented interventions during shared book reading increased the frequency of their children’s use of communicative forms with corollary increases in the frequency of communicative functions (Koppenhaver et al., 2001; Light et al., 1994). Thus, caregivers’ use of interventions could have a major impact on the development of emergent literacy skills by their young children with disabilities.

In addition to focusing on caregivers as the implementers of interventions, researchers have focused on the delivery of the interventions in natural environments (i.e., shared book reading at home). This largely has been due to policies that state early intervention services should be provided in the child’s natural environment. Because homes are one natural environment for young children, the present study was conducted in the participants’ homes. The strategies contained in the interventions and the instruction with the caregivers, however, varied with respect to the targeted skills.

For the intervention studies that targeted communication skills for children age 3 to 5 years old with significant disabilities, caregivers were taught interventions that contained the following strategies: (a) modeling, (b) prompting, (c) waiting, (d) use of AAC devices, (e) aided language stimulation, (f) use of familiar and unfamiliar books, (g) peer modeling, and (h) turn-taking. However, replication studies on the use of these strategies with children, age 3 to 5 years old, with significant disabilities is limited.

The instruction of caregivers on the use of the caregiver-implemented interventions varied in frequency, intensity, and format. For example, some researchers
instructed caregivers through an initial instructional session plus weekly home visits (Saint-Laurent et al., 1998), while other researchers conducted weekly instructional sessions to model the intervention for caregivers (Trudeau et al., 2003). Because the format, frequency, and intensity of the instruction has varied across studies, there is a lack of evidence to support one method for instructing caregivers to use caregiver-implemented interventions in the context of shared book reading.

The caregiver-implemented shared book reading interventions that have been examined have targeted only communication. Additional research is needed on caregiver-implemented shared book reading interventions that target other emergent literacy skills (i.e., phonological awareness, participation in shared book reading) that have been targeted for children, 3 to 5 years old, with significant disabilities, and children with disabilities, who are below 3 years of age.

**Statement of the Problem**

The studies reviewed above offer preliminary empirical support for using interventions focused on increasing communication in the context of early literacy experiences with children, age 3 to 5 years old, who are at risk, including children with disabilities. Research focused on caregiver-implemented interventions during early literacy experiences has shown increases in the communicative behaviors of children, 2 to 7 years old who have disabilities, specifically those who have significant disabilities. However, research using caregiver-implemented interventions in the context of early literacy experiences with children birth to 36 months of age with disabilities, particularly children with significant disabilities, is limited in three ways. First, only one of the identified studies included children younger than 3 years old with significant disabilities (Light & Kelford-Smith, 1993). That study is limited further because, while the caregivers
read familiar and unfamiliar books with their children, the caregivers did not learn a specific intervention to use during their shared book reading sessions. Therefore, there is a need for research on the use of specific interventions implemented by caregivers of children birth to 36 months with significant disabilities. Second, no set of caregiver-implemented interventions has been used in multiple studies with children 3 to 5 years old who have significant developmental delays; thus, a series of intervention studies is needed to systematically study the effect of various interventions that target increasing communication in the context of early literacy experiences for children birth to 36 months old who have significant developmental delays. The present study begins to address this need by investigating the effect of instructing caregivers in a caregiver-implemented shared book reading intervention with their children 18 to 34 months old who have significant developmental delays, and the corollary changes in their children’s use of communicative behaviors during those shared book reading sessions. Third, the interventions that target communication, presume the child participants are able to use symbolic language. That is, the children with significant delays in communication in the studies are able to use symbolic forms of language (i.e., words, pictures). For children who use pre-symbolic forms of communication, interventions should address caregiver-implemented interventions that acknowledge and promote these pre-symbolic communicative forms (i.e., vocalizations) in a familiar context (i.e., shared book reading). The present study begins to address the need for caregiver-implemented shared book reading interventions that target pre-symbolic communication by investigating the effects of instructing caregivers on a shared book reading intervention that promotes the use of children’s pre-symbolic and symbolic communicative forms.
For the present study, the caregiver-implemented shared book reading intervention targeted communicative forms and functions used by children age 18 to 34 months with significant developmental delays during shared book reading with their caregivers in their homes. The context of shared book reading was selected because research has suggested that: (a) children with disabilities have different early literacy experiences than children without disabilities (Breit-Smith et al., 2010; Light & Kelford-Smith, 1993; Marvin & Mirenda, 1993; Marvin & Wright, 1997; Weikle, & Hadadian, 2004); and (b) early literacy experiences facilitate oral language development (Bus et al., 1995). Caregivers were taught three intervention components: (a) setting the environment procedure to facilitate communication during shared book reading; (b) initial prompting strategies (i.e., labeling pictures and words to which the child already is focused then waiting up to 3 s, tapping pictures and words to shift the child’s focus to a different location in the book then waiting up to 3 s, requesting the child to point to pictures or label pictures in the book then waiting up to 3 s); and (c) follow-up prompting strategies (i.e., helping the child to shift attention to a location in the book by placing the child’s hand on a location, modeling the correct response if the child does not respond or responds incorrectly). The setting the environment procedure was selected to facilitate the interactive nature of shared book reading. For the present study, the caregivers arranged themselves, the book, and their children such that the child and caregiver could see each other’s faces and the book (Light et al., 1994). The prompting strategies were selected because they are appropriate prompts for children who are in the targeted age range and who have functional ability limitations in communication (Whalen & Schreibman, 2003). In addition, increasing caregivers’ prompts that are
contingent on their children’s behaviors, and focusing their children’s attention to a picture before labeling it, have been linked to increased communicative behaviors in children birth to 3 years with disabilities (Paparella & Kasari, 2004; Rocha, Schreibman, & Stahmer, 2007).

For the present study, the caregivers were instructed in the use of three components of an intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies). The instruction conducted with the caregivers was adapted from previous research conducted with caregivers of young children (Rocha et al., 2007; Woods et al., 2004). However, these interventions were not conducted in the context of an early literacy experience. The dependent variable examined to determine the effectiveness of the instruction was the caregivers’ use of the prompting strategies. This was selected as the primary dependent variable because it provided information about the effectiveness of the researcher’s instruction with the caregivers. In addition, the prompting strategies are the caregivers’ bids for communication that set the occasion for the child to communicate. Setting the environment is a procedure that can facilitate communication but is not sufficient for eliciting communication. Therefore, the dependent variable of interest was the caregivers’ use of the prompting strategies.

The second dependent variable examined was the corollary changes in the children’s use of communicative forms and functions. This was examined to provide information on any changes the might have occurred in the children’s’ use of communicative behaviors following their caregivers’ instruction in and implementation of the initial and follow-up prompting strategies during shared book reading.
Significance of the Study

The combination of functional ability limitations in communication and differences in early literacy experiences for children with significant disabilities suggests the need to examine interventions that might be effective for increasing the children's use of communicative behaviors during early literacy experiences. Because the majority of early literacy experiences occur in natural environments such as homes, examining the impact of caregivers implementing interventions for increasing the use of communicative behaviors used by their children 18 to 34 months of age with significant developmental delays, in the context of early literacy experiences (i.e., shared book reading) at home is important for two reasons. First, children's use of communication has been linked to the development of emergent literacy (Blischak, 1995; Erickson & Koppenhaver, 1997; Koppenhaver et al., 1991). Second, early literacy experiences in the home, such as shared book reading, provide contexts that facilitate communication between caregivers and their children.

The secondary purpose of this study, therefore, was to look at corollary changes the use of communicative forms and functions of children birth to 36 months of age with significant developmental delays, when their caregivers implemented interventions during one type of early literacy experience (i.e., shared book reading). This would expand the field's knowledge about the effectiveness of caregiver-implemented intervention. The main purpose of this study, however, was to determine the effects of instructing caregivers to use shared book reading interventions at home with their children 18 to 34 months of age with significant developmental delays. This would expand the field's knowledge about the effect of instruction on caregivers' use of the targeted shared book reading interventions.
Purpose of the Study

The purpose of this study was to determine: (a) if instruction in caregiver-implemented shared book reading interventions (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions at home. The study addressed the following research questions:

a. Is instruction in a caregiver-implemented shared book reading interventions (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) functionally related to the caregivers’ use of initial and follow-up prompting strategies during shared book reading at home with their children age 18 to 34 months with significant developmental delays?

b. Does the caregivers’ use of the initial and follow-up prompting strategies during shared book reading at home result in corollary changes in their children’s use of communicative forms and functions with their caregivers during shared book reading sessions?

c. Do caregivers maintain their use of initial and follow-up prompting strategies during shared book reading at home with their children at 2 weeks and 4 weeks following the termination of the intervention phase?

d. Do children age 18 to 34 months with significant developmental delays maintain corollary changes in their use of communicative forms and functions with their caregivers during shared book reading sessions at home at 2 weeks and 4 weeks following the termination of the intervention phase?

e. Does the use of caregiver-implemented shared book reading intervention affect the duration of shared book reading sessions?

Delimitations and Limitations

This study focused on two populations. First, it focused on young children 18 to 34 months of age. The age of 18 months was selected as the minimum age because a 50% delay in communication would include children whose developmental age was 9
months, when targeted communicative forms and functions develop in children with typical development. A maximum age of 34 months was selected because of the limited research focused on the use of shared book reading interventions with children below 36 months of age. For the purposes of this study, communicative forms and functions are variables of interest. At about 1 year of age, toddlers who are typically developing use various forms of communication to request, comment, question, and respond (Rescorla & Mirak, 1997). Communicative forms and functions were selected to study, therefore, because in the absence of speech or other symbolic forms of communication, children with significant developmental delays often use pre-symbolic forms of communication. These include gestures, eye gaze, or vocalizations to express various functions or intents (Sigafoos et al., 2004). Studying the impact on both form and function acknowledges the interrelatedness of a child’s communicative form and the function of the communication attempt.

There are many developmentally appropriate contexts in which children who are 18 to 34 months of age develop and use communication. Shared book reading is one developmentally appropriate context. It was selected as the milieu for the caregiver-implemented intervention and for measuring child communicative forms and functions because the connection between language development and shared book reading has been demonstrated empirically for 3-to-5-year old children (Whitehurst et al., 1988). Shared book reading creates a context for communication in which the opportunity exists for multiple reciprocal interactions between a caregiver and a child. Caregivers often read the same books with their children repeatedly. This repeated reading allows their children to practice the communication routines that develop during shared book
readings. Repeated readings of the same book and multiple opportunities for practice make shared book reading a context for children to predict the next turn or phrase based on their established communication routine for a particular book.

Thus, caregivers were the second population of interest for this study. Caregivers were the adult participants who provided the majority of daily care for the child participants in the study, who were 18 to 34 months old with significant developmental delays. For the present study, a primary caregiver could have been, but was not limited to, a child’s biological parent, grandparent, stepparent, relative, or adoptive parent. Caregivers were at least 18 years old and the legal guardian for the child participant and could speak and read English as their primary language.

The number of participating children and their caregivers was small and focused on a limited geographical area, due to the small number of children meeting the selection criteria and the design of the study. The single-subject experimental research design, to be explained in the method section, was structured to control for possible threats to external and internal validity.

The results of this study are affected by a number of limitations. One limiting factor was the duration of the study, approximately 4 months. Maturation effects might have been present due to the young age of the child participants, as they continued to grow and develop during the study. Regarding maturation for the caregivers, exposure to other variables (i.e., therapists, media) over time might have influenced their use of the intervention during the study. Use of a multiple baseline design addressed issues of maturation as a potential threat to internal validity because data were collected on the same behaviors for each participant during each phase of the study (Kennedy, 2005);
therefore, each participant was maturing during the study. The possibility also exists that other background factors might affect study findings and these might not be disentangled from the results. These factors might include: participants receiving early intervention services during data collection, the consistency with which caregivers engaged in shared book reading, and medical conditions that might affect a participating child's performance or the data collection process itself. With single-subject experimental designs, some of these factors are addressed through multiple baseline measures, treatment fidelity measures, the use of child performance measures, and measures used to characterize the participants. For the present study the measures used to characterize the participants were: (a) the ABILITIES Index (Simeonsson & Bailey, 1991), (b) the Stony Brook Family Reading Survey (Whitehurst, 1993), the Hollingshead Four Factor Index (Hollingshead, 1975), and (c) the Unstructured Joint Attention Assessment (adapted from Loveland & Landry, 1986).
CHAPTER 2
REVIEW OF THE LITERATURE

The purpose of this chapter is to provide a review of the literature on the efficacy of instructing caregivers in shared book reading interventions (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) for use with their young children with significant developmental delays, to increase their children’s communicative forms and functions. First, in order to understand the relevance of both instructing caregivers to use interventions during early literacy experiences and the development of emergent literacy for children with developmental delays, it is necessary to understand how early literacy experiences help children develop emergent literacy. Therefore, early literacy experiences and how those experiences relate to the development of emergent and later (i.e., conventional) literacy for young children who are typically developing are described. Second, a description is provided of conceptual models of emergent literacy that appear in the literature. Third, a description is provided of early literacy experiences for young children who are at-risk for not developing emergent literacy and how those experiences differ from those experiences of children who are typically developing. One subset of the population of children at-risk for not developing emergent literacy, children with disabilities, is relevant to the proposed study; therefore, a focused review of the research regarding early literacy experiences for children with disabilities is presented fourth. Fifth, a review is provided of empirical research that targets the development of emergent literacy in young children with disabilities and the interventions used with them during early literacy experiences. This review highlights the implementers of these interventions, the skills targeted with the interventions, and components of the interventions. Finally, information
is provided on empirical research on approaches to instructing caregivers to use caregiver-implemented interventions to increase communicative behaviors of their young children with developmental delays. Tables that summarize the reviewed literature also are provided.

**Early Literacy Experiences for Young Children who are Typically Developing**

This section of the review describes the relevance of early literacy experiences in the development of emergent literacy for children birth to 5 years old that are typically developing. In 1966, Marie Clay coined the term *emergent literacy* to describe the early reading and writing knowledge children acquire before they receive formal instruction in literacy (Teale & Sulzby, 1986). Emergent literacy develops when caregivers expose their children to early literacy experiences and model reading and writing. Early literacy experiences are embedded primarily within interactions between young children and caregivers during literacy activities such as shared book reading, library visits, and exposure to literacy-rich environments (Light & Kent-Walsh, 1993). These early literacy experiences are favorable contexts for developing emergent literacy because they provide a naturally occurring routine that facilitates interaction between a caregiver and the child (Liboiron & Soto, 2006). Such naturally occurring interactive routines have been shown to increase language use (Ninio & Bruner, 1978) and vocabulary skills (Ninio, 1983) in young children.

Literacy is valued in American culture and from an early age it is encouraged in children who are typically developing. Cunningham and Allington (1999) reported that children who are typically developing and who come from middle-class homes where literacy has been a part of their households since birth enter kindergarten with more than 1,000 hours of early literacy experiences. Justice (2006) reported that as early as
24 months of age many children demonstrate behaviors that reflect emergent knowledge about print by holding a book correctly, listening to stories and rhymes, and understanding that print has meaning. At 3 years of age, many children can identify some letters, engage in letter-like print, and look at books independently (Justice, 2006). By 4 years of age children often can write their names and recognize environmental print (Justice, 2006).

Emergent literacy is the foundation for later (i.e., conventional) literacy skills (Justice & Pullen, 2003). Because of this link between emergent literacy and later (i.e., conventional) literacy, researchers have examined which early literacy experiences support the development of emergent literacy. Shared book reading is one early literacy experience that has been studied extensively and is recommended widely to enhance children’s development of emergent literacy and language. For example, Whitehurst et al. (1988) found that children who are typically developing demonstrated statistically significant differences between pre- and post-test scores of expressive language after their caregivers implemented a 1-month intervention during shared book reading in their home. The researchers randomly assigned children from 21 to 35 months of age to experimental and control groups. The caregivers of children in the experimental group attended two instructional sessions focused on implementing researcher-developed interventions. The researchers designed the interventions with the intent of changing the frequency of child-directed language that caregivers used during shared book reading. Caregivers in the control group received no instruction on the interventions. The shared book reading sessions for both sets of caregivers were audio taped and transcribed. Changes in the caregivers’ use of language had an impact on their
children’s use of expressive language during shared book reading. Even during a 9-month follow-up, statistically significant differences were observed between the experimental group that received instruction and the control group that received no instruction on the intervention.

Studies have shown that shared book reading has positive effects on the development of emergent literacy. However, differences have been found in the degree to which shared book reading affects the emergent literacy of children who are typically developing. In a meta-analysis, Scarborough and Dobrich (1994) focused on studies related to the frequency with which caregivers engaged in shared book reading with their children aged 3 to 5 years. These researchers examined 31 studies to determine whether relationships existed between shared book reading and emergent literacy, later (i.e., conventional) literacy, or language. The meta-analysis of shared book reading studies conducted in both home and preschool environments indicated that shared book reading positively affected the children’s development of emergent literacy and language (Scarborough & Dobrich, 1994). However, these researchers suggested that while there was a relationship between shared book reading and both later (i.e., conventional) literacy and language, the strength of these relationships might not be as strong as anticipated. They indicated that frequency of shared book reading was an important variable, but might not have the linear relationship predicted. The researchers suggested that shared book reading and other characteristics (e.g., attitude toward reading, caregiver reading style) also might contribute to language and later (i.e., conventional) literacy.
Bus et al. (1995) completed another meta-analysis of studies that focused on home literacy environments of children age 3 to 5 years old that are typically developing. The researchers examined 41 studies that focused on the relationships between frequency of shared book reading and emergent literacy, later (i.e., conventional) literacy, and language growth for preschool and school age children. The results indicated that shared book reading was related positively to emergent literacy, later (i.e., conventional) literacy, and language growth (Bus et al., 1995). In their meta-analysis, shared book reading accounted for 8% of the variance in the outcome measures, showing a strong relationship between shared book reading and language. Based on these results, the researchers concluded that early literacy experiences in the form of shared book reading contributed to the development of emergent literacy and language growth (Bus et al., 1995).

In addition, Reese and Cox (1999) found that adult interaction style during shared book reading and writing activities affected the vocabulary, comprehension skills, and conceptual knowledge of print of children who were typically developing. The researchers conducted a 6-week intervention study with 48 children that were 4 years old to determine which adult style demonstrated during shared book reading had a greater impact on emergent literacy. The children were matched according to pretest language measures and randomly assigned to one of three reading styles: descriptive, comprehender, and performance-oriented. Readers who were blind to the study purpose prepared five questions and five comments for each researcher-selected book used in the study. When adults used the describer style, their comments and questions focused on labels and descriptions; when adults used the comprehender style, their
comments and questions focused on predictions and inferences; and when adults used the performance-oriented style, their questions and comments focused on inferences and evaluation at the end of the shared book reading session. Results showed that the describer style of reading impacted children’s vocabulary and conceptual knowledge of print more than comprehender and performance-oriented adult reading styles. These results are significant and extend the research in shared book reading because they demonstrated that the style of adult-child interaction during shared book reading affects children’s development of emergent literacy. These results extend the research in shared book reading by demonstrating that adult interaction style impacted children’s language, In addition this research demonstrated that interventions implemented within early literacy experiences in home and preschool environments, and focused on changing the type of adult interactions with children, can improve children’s vocabulary and conceptual knowledge of print.

In 1997, the National Reading Panel (NRP) reviewed the literature on reading and writing in the elementary grades. However, the NRP review did not contain research with children birth to 5 years old. In light of evidence on the relationship between early literacy and later (i.e., conventional) literacy, the National Early Literacy Panel (NELP) was commissioned to: (a) review studies on practices used in intervention research that contributed to later (i.e., conventional) literacy that were used with children younger than 5 years of age; and (b) identify specific emergent literacy components linked to later (i.e., conventional) literacy (NELP, 2008). Through the review of nearly 500 studies, the NELP identified five practices and six components specific to emergent literacy. The practices were: (a) code-focused interventions – decoding of the alphabet; (b) shared
reading interventions – reading books with children; (c) language-enhanced interventions – improving children language development; (d) caregiver and home programs – caregivers as implementers of interventions; and (e) preschool and kindergarten programs – interventions within school contexts. The specific components of emergent literacy identified by the NELP were: alphabet knowledge, phonological awareness, concepts about print, invented spelling, oral language, and name writing. While the context for early literacy experiences and the intervention focus varied across the 500 studies reviewed, the NELP indicated that collectively the evidence suggests that early literacy experiences relate to later (i.e., conventional) literacy.

**Conceptual Models of Emergent Literacy**

Through the 1980’s a reading readiness perspective was the prevailing theoretical approach to describing early literacy development. A reading readiness perspective views young children as not mature enough to benefit from literacy instruction and in need of prerequisite skills before receiving formal instruction in reading at school (Teale & Sulzby, 1986). As research has been conducted and theory in infant and child development has evolved, the notion that children could learn to read only through formal instruction in schools was replaced with a theoretical perspective that recognizes and values the early reading and writing knowledge children acquire before going to school, known as *emergent literacy*. This theoretical perspective also acknowledges the informal settings of family, home, and community as places where literacy development begins for infants and preschoolers (Wasik & Hendrickson, 2004).

Emergent literacy is a broad perspective, with many researchers developing models to conceptualize, assess, and study literacy development. A review of the literature revealed seven conceptual models of emergent literacy and an examination of
these models indicated that researchers generally have used two different approaches to conceptualize emergent literacy. One approach used to conceptualize emergent literacy was the cognitive science approach (Stone, 2004). Using this approach, researchers identified emergent literacy components that comprise early reading and writing knowledge and that develop through explicit instruction (Mason & Stewart, 1990; NELP, 2008; Senechal et al., 2001; Whitehurst & Lonigan, 1998; Justice & Kaderavek, 2002). These models focus on the process of acquiring the components, the relationships between the components of emergent literacy, and the relationship between the acquisition of the components and later (i.e., conventional) literacy. For five of the seven models that use the cognitive approach, researchers identified similar components of emergent literacy (Mason & Stewart, 1990; NELP, 2008; Senechal et al., 2001; Whitehurst & Lonigan, 1998; Justice & Kaderavek, 2002). For example, each of these five models identified the following as components of emergent literacy: (a) print awareness, alphabet knowledge and concepts about print; (b) phonological awareness, and forms and functions of print; and (c) knowledge about the forms and functions of print. Four of these five emergent literacy models also identified language as a separate component of emergent literacy (Mason & Stewart, 1990; NELP, 2008; Senechal et al., 2001; Whitehurst & Lonigan, 1998), with only Justice and Kaderavek (2002) not including language as a separate component. One of these five models identified metalinguistics as a component of emergent literacy, and defined it as the vocabulary used to talk about written text (Justice & Kaderavek, 2002). While Senechal et al. (2001) also used the term metalinguistics, they defined it as phonological and syntactic
awareness. The model described by NELP (2008) was the only conceptual model that also identified visual processing of print as a component of emergent literacy.

Another approach used to conceptualize emergent literacy is the sociocultural approach (Stone, 2004). Through this approach emergent literacy is viewed as developing through social engagement and interaction with their caregivers. Central to the sociocultural approach is that emergent literacy is linked to the social context of the early literacy experience (Stone, 2004). For example, Kaderavek and Rabidoux (2004) described levels of emergent literacy that develop within the context of socially mediated experiences and lead to later (i.e., conventional) literacy. As children transition from using emergent literacy to using later (i.e., conventional) literacy, these researchers suggest that there are five levels of social and environmental support to help children develop literacy: (a) level 1-- attention and responsiveness during literacy interactions; (b) level 2 -- balance and turn-taking during literacy interactions; (c) level 3 -- symbolic understanding of the written form; (d) level 4 -- conventional literacy support by social interaction; and (e) level 5 -- independent conventional literacy (Kaderavek & Rabidoux, 2004). In describing the transition from emergent to later (i.e., conventional) literacy in terms of levels of support, the researchers suggest that the development of emergent literacy for children with significant developmental delays is a dynamic process. In this dynamic process, the researchers propose that a child might not transition from emergent to later (i.e., conventional) literacy in a linear progression through levels, and that the level of support might vary depending on the literary context and task (Kaderavek & Rabidoux, 2004).
Also using a sociocultural approach to conceptualize emergent literacy, Goodman (1986) describes five roots of literacy. Goodman (1986) believes “that the development of knowledge about print embedded in environmental settings is the beginning of reading development” (Goodman, 1986, p. 7). Goodman defines the five roots of literacy as: (a) print awareness in situational contexts, (b) print awareness in connected discourse, (c) functions and forms of print, (d) use of oral language to talk about print, and (e) metacognition and metalinguistic awareness about print (Goodman, 1986).

Of the seven conceptual models of emergent literacy identified, two are discussed in detail in the following sections. These two conceptual models were selected because, like the other conceptual models, they are consistent with an emergent literacy perspective; but unlike the other models, they are supported by empirical research on children’s emergent literacy.

**Emergent Literacy Model One**

The first model of emergent literacy discussed in detail defines two domains of skills demonstrated by specific behaviors associated with components of emergent literacy and suggests instruments for measuring children’s attainment of these components. In their model, Whitehurst and Lonigan (1998) suggest that emergent literacy consists of two domains of skills: outside-in skills and inside-out skills. Outside-in skills are broad and show children’s knowledge of the context of literacy. These skills relate to knowing the conventions of print, understanding print, creating print, and understanding language. Outside-in skills are necessary for children to understand the content they have read, and apply their knowledge of the world to that content. For evaluating these skills, Whitehurst and Lonigan (1998) suggested assessment instruments such as the Peabody Picture Vocabulary Test – R (Dunn & Dunn, 1981),
Concepts about Print Test (Clay, 1979), and portions of the Developing Skills Checklist (CTB, 1990). In contrast, inside-out skills represent children’s ability to translate the text to something meaningful. Inside-out skills are applying known rules (e.g., alphabet knowledge, phonological awareness, letter-sound correspondence, syntax) to the text while reading and writing. To evaluate inside-out skills, Whitehurst and Lonigan (1998) recommended such assessment instruments as invented spelling (Teale & Sulzby, 1986) and portions of the Clinical Evaluation of Language Fundamentals – Preschool (Wiig, Secord, & Semel, 1992).

Whitehurst and Lonigan (1998) conducted research to determine how outside-in and inside-out skills were related to each other. They evaluated several hundred children who were from families of low SES at the end of seven consecutive school years from Head Start through fifth grade. These evaluations were the context in which the children demonstrated their knowledge of emergent literacy. The evaluations at the end of Head Start and kindergarten addressed outside-in and inside-out skills, while evaluations at the end of first through fifth grades addressed reading ability and language. Using structural modeling Whitehurst and Lonigan (1998) found that: (a) outside-in skills and inside-out skills were stable in children at an early age; (b) inside-out skills determined in kindergarten predicted later reading ability; and (c) the relationship between outside-in skills and inside-out skills at the end of Head Start was strong, but diminished in first and second grade. Most significant in their study was that interventions that focus on activities such as shared book reading influenced outside-in skills, and interventions that focused on alphabet activities influenced inside-out skills. In addition, their study showed that the effect of outside-in skills diminished after
kindergarten. Furthermore, the effect of inside-out skills correlated with successful reading in later grades. This research is relevant to the study of emergent literacy because it shows the effects of different types of early literacy experiences on specific components of emergent literacy. However, because formal assessment tools were used children were only assessed on their ability to demonstrate their knowledge of literacy in the context of print and in the context of assessment.

**Emergent Literacy Model Two**

The second model of emergent literacy discussed in detail was developed by Senechal et al. (2001). Their model comprises three components. Their first component is concepts of emergent literacy. One of the two concepts of emergent literacy Senechal et al. (2001) describe is conceptual knowledge of literacy, which is knowledge about the act of reading and the perception of one’s self as a reader. The other concept of emergent literacy described by the researchers is procedural knowledge of literacy, involving the mechanics of reading, such as letter-sound knowledge and word reading. The second component of their emergent literacy model is oral language, consisting of listening comprehension, vocabulary, and narrative knowledge. The third component of their emergent literacy model is metalinguistics, which is made up of phonological awareness and syntactic awareness.

Senechal et al. (2001) used this model to study the patterns of relationships among these components of emergent literacy and the role of each component in literacy acquisition. They evaluated concepts of emergent literacy, oral language, and metalinguistics for 84 children at the beginning of their kindergarten and first grade years. They also measured the children’s reading ability at the end of their first grade year, and reading fluency at the end of their third grade year. Senechal et al. (2001)
found that: conceptual knowledge of emergent literacy was predictive of oral language, but not predictive of metalinguistics; and procedural knowledge of emergent literacy was predictive of metalinguistics, but not predictive of oral language. In addition, their study indicated that, “early conceptual knowledge of literacy was not a predictor of later procedural knowledge of literacy, and vice versa” (Senechal et al., 2001, p. 453). These researchers demonstrated that different early literacy experiences and the focus of these experiences affect differently the components of emergent literacy.

**Conclusion**

In conclusion, the two conceptual models discussed above describe similar components and demonstrate how these components of emergent literacy are related to each other. Studies using these two models have shown that: (a) components of emergent literacy are related to each other and are stable at an early age (Senechal et al., 2001; Whitehurst & Lonigan, 1998); and (b) phonological awareness and letter-sound knowledge are more predictive of later reading ability than oral language (Senechal et al., 2001; Whitehurst & Lonigan, 1998).

These two models are different, however, in three ways. First, Whitehurst and Lonigan (1998) defined literacy by the specific behaviors with which children demonstrate knowledge in the context of printed text only. They also recommended assessment instruments for evaluating literacy knowledge in children without disabilities. However, their identification of specific behaviors to demonstrate knowledge of components of emergent literacy does not consider the variety of behaviors children with disabilities might use to demonstrate emergent literacy (Erickson & Hatton, 2007). Furthermore, the theoretical perspective of emergent literacy along with the Senechal et
al. (2001) conceptual model, view the behaviors that demonstrate engagement as relevant aspects of emergent literacy (Kaderavek & Rabidoux, 2004).

Second, Whitehurst and Lonigan (1998) linked their components of emergent literacy to assessments. However, an emergent literacy perspective views literacy as developing through interactions with adults in the context of literacy prior to formal instruction (Teale & Sulzby, 1986). Therefore, evaluating literacy in a formal context might not provide the most accurate assessment of emergent literacy for children with or without disabilities.

Third, Senechal et al. (2001) identified language as a separate component of emergent literacy that could be assessed outside the context of printed text. Other researchers have supported the view that language is a separate component of emergent literacy and have suggested that print knowledge is separate from language (Lonigan, Burgess, & Anthony, 2000). In contrast, Whitehurst and Lonigan (1998) embedded language as part of outside-in skills and described language only in the context of printed text.

**Early Literacy Experiences for Young Children who are At-Risk**

This section of the review describes the differences in early literacy experiences between children who are typically developing and children from populations that are at-risk for not developing emergent literacy. The National Assessment of Educational Progress (NAEP; 2007) report of reading assessment revealed that 33% of fourth graders did not have basic reading skills. These results were even higher for children from families of low SES, minority groups, and English-language learners. The data from the NAEP (2007) report revealed that 54% of black fourth graders and 50% of Hispanic fourth graders did not have basic reading skills. In addition, the report showed
that 50% of fourth graders who were eligible for the national school lunch program did not have basic reading skills. Finally, 70% of fourth graders who were English language learners and 64% of children with disabilities did not have basic reading skills. Children from these and other at-risk populations have been found to have different early literacy experiences (Breit-Smith, Cabell, & Justice, 2010; West, Denton, & Germino-Hausken, 2000; Zaslow, Dorey, & Limbos, 2008). These children frequently have one or more of the following risk factors: (a) caregivers with low socioeconomic status, (b) families who are English language learners, (c) caregivers with a history of reading difficulties, (d) special health care needs, and (e) disabilities (Justice & Pullen, 2003). These risk factors are discussed in the following sections.

**Children from Families of Low Socioeconomic Status**

Differences have been suggested in early literacy experiences between children from families of low socioeconomic status (SES) and children who are typically developing. Researchers have found that children from families of low SES have fewer community literacy experiences (e.g., going to the library) than their peers from families of middle to high SES (Hockenberger et al., 1999) and engage in shared book reading with their caregivers less often than their peers (Nord, Lennon, Liu, & Chandler, 2000). Reportedly, 69% of children from families of low SES engaged in shared book reading three or more times per week, compared to 85% of children from families of middle or high SES who engaged in shared book reading three or more times per week (Nord et al., 2000).

In addition, West, Denton, and Germino-Hausken (2000) found there were fewer books in the homes of children from families of low SES and whose mothers had lower levels of education, than in the homes of children from middle to high SES and whose
mothers had higher levels of education. Children from families of middle and high SES typically had more than 25 children’s books in the home, compared to children from families of low SES who had between zero and 25 books.

**Children who are English Language Learners**

According to a survey by the Federal Interagency Forum on Child and Family Statistics (CFS; 2011), English is not the primary language spoken in the homes of 21% of school-age children in the U.S. and these children have difficulty speaking English. In addition, caregivers in only 37% of the Hispanic families and 35% of the Black families surveyed read to their children daily, in contrast to 66% of caregivers in the White families and 60% of Asian families surveyed. These differences in frequency of shared book reading experiences might reflect social or cultural differences in family life rather than differences in the value caregivers place on early literacy experiences in the home (Teale & Sulzby 1986). However, in spite of the research that suggests early literacy experiences such as shared book reading are linked to later (i.e., conventional) literacy, data continue to demonstrate that for children from families in which English is not the primary language spoken at home, differences occur in their early and later (i.e., conventional) literacy development when compared with children from families in which English is the primary language (CFS, 2009).

**Children of Families with Reading Difficulties**

One study was found that suggests differences in early literacy experiences exist between children of caregivers with reading difficulties and children whose caregivers did not have reading difficulties. Laakso, Poikkeus, and Lyytinen (1999) found that toddlers whose mothers had reading difficulties and whose family had a history of reading difficulties interacted with their caregivers differently during early literacy.
experiences than their toddler peers whose caregivers did not have reading difficulties. The researchers observed 128 mother-child pairs as they read novel picture books with their 14-month-old children. The pairs consisted of 39 mothers who had reading difficulties and 81 mothers who did not have reading difficulties. The mothers’ behaviors were observed and coded for: (a) labeling and describing, (b) eliciting their children’s participation, (c) responding to their children’s behavior, and (d) getting their children to attend to the task. The pairs were observed again when the child participants were 18 months old. For the initial observation at 14 months, no differences were found between the two groups in the number of caregiver interactive behaviors observed (e.g., labeling and describing; responding) or child language ability. However, descriptive statistics showed that for toddlers of mothers who did not have reading difficulties, there was a positive association between their caregivers’ orienting behaviors (e.g., getting the child’s attention) during shared book reading and language development. In contrast, for toddlers of mothers who had reading difficulties, there was a negative association between the mothers’ orienting behaviors during shared book reading and language development (Laakso et al., 1999). These results indicate that when compared to mother’s who had reading difficulties, the mother’s who were identified with reading difficulties used different mechanisms for coordinating their children’s attention to the task of shared book reading.

Children with Special Health Care Needs

When reviewing the literature, one study was found that showed differences in early literacy experiences between children with special health care needs and children who are typically developing. Zaslow et al. (2008) found that the medical conditions of children with special health care needs were associated with delays in language and
cognition. Because of these delays, children with special health care needs are at risk for delays in developing emergent literacy skills. In this survey study of 105 caregivers, Zaslow and his colleagues found that caregivers of children with special health care needs reported they did not engage in early literacy experiences with their children (e.g., shared book reading) because they did not know how to do so (Zaslow et al., 2008). While many caregivers reported reading with their children, 67% of those surveyed reported they did not read daily. In addition, caregivers reported medical-related activities as one of their most time-consuming daily activities, which might have been a barrier to the caregivers engaging daily in shared book reading with their children (Zaslow et al., 2008).

**Children with Disabilities**

This section is a focused review of the research on early literacy experiences for children with disabilities. Several databases were consulted to identify research related to early literacy experiences of children with disabilities. The databases were: Academic Search Premier, the Cumulative Index of Nursing and Allied Health (CINAHL), Educational Resources Information Clearinghouse (ERIC), PsychINFO, Psychology and Behavioral Collection, and Sociological Collections. Key terms used for the search were: home literacy, disabilities, and differences. These terms were used in various combinations and resulted in 20 references. From this list relevant research was selected based on the following predetermined criteria: (a) the reference reported an empirical study; (b) the study focused on home literacy experiences; (c) most of the participants were between the ages of birth and 5 years; (d) some of the participants were identified as having disabilities; (d) the study was published in a peer reviewed journal; and (e) the study was published between 1990 and 2010. The time frame of
1990 to 2010 was selected for three reasons. First, Teale and Sulzby’s seminal book on emergent literacy was published in 1986. This new perspective of literacy development provided a context for researchers to examine literacy skills in young children. Second, Part B of EHA was amended to extend services for children 3 to 5 years of age in 1986. Third, Part C also was added to EHA in 1986 mandating services for children birth to 3 years of age. These provisions also provided researchers with a context for examining early literacy experiences in homes and preschool settings. This process resulted in four studies. Next, the author conducted hand searches and ancestral searches from the reference lists of these four studies to find other published research that met the criteria. This resulted in an additional six studies.

Of the 10 identified studies that met the criteria, researchers in five of the studies compared early literacy experiences of young children with disabilities to the early literacy experiences of children without disabilities (Breit-Smith et al., 2010; Light & Kelford-Smith, 1993; Marvin & Mirenda, 1993; Marvin & Wright, 1997; Weikle, & Hadadian, 2004). Two of the remaining studies focused on children with intellectual disabilities: one described their home literacy experiences (Al Otaiba, Lewis, Whalon, Dyrlund, & McKenzie, 2009); and the other compared the home literacy experiences of children with intellectual disabilities to children without disabilities (van der Schuit, Peeters, Segers, Balkom, & Verhoeven, 2009). Home literacy experiences of children with sensory impairments were described in two studies (Craig, 1996; Stobbart & Alant, 2008). Finally, one of the identified studies compared the home literacy experiences of children diagnosed with a single disability to those with multiple disabilities (Marvin, 1994).
Characteristics of child participants

The ages of the child participants in the 10 identified studies ranged from 1 month to 8 years. Participants across the studies comprised 1,616 children with disabilities, as identified with the various state criteria for types of disabilities, and 993 children without disabilities. The disabilities of the child participants varied across studies. Some studies included children with one disability type, such as Down syndrome (Al Otaiba et al., 2009). Other studies included children with different disabilities. For example, Marvin and Mirenda (1997) studied home literacy experiences of children with disability labels such as learning disabilities, speech language impairments, mental handicaps, and autism. In addition, some studies included both child participants who had one disability and child participants with more than one disability (Marvin, 1994). See Table 2-1 for the child participant characteristics.

Research design

All 10 of the identified studies used survey research methodology. Specifically, each of the 10 identified studies used questionnaires to elicit information from caregivers about their children’s home literacy experiences. Light and Kelford-Smith (1993) developed a questionnaire that was used in 7 of the 10 identified studies, in either its original form or and adapted form. The Light and Kelford-Smith (1993) questionnaire focused on a different contexts for shared book reading, based on the premise that a person’s understanding of literacy must be based on the context in which literacy occurs. This questionnaire addressed the physical and functional contexts (e.g., What printed materials are in your home?), language contexts (e.g., When you read a book with your child, what do you usually say?), and cultural contexts (e.g., When your
child is involved in reading and writing activities, does anyone else participate?) of children’s literacy experiences.

Weikle and Hadadian (2004) used a different questionnaire. Their questionnaire focused on demographic information, types of literacy practices, and use of technology. The purpose of their questionnaire was to determine if differences existed in the caregivers' literacy practices, if the caregivers’ age and education influenced those practices, and if differences existed in the way caregivers viewed the use of technology to promote literacy.

To gain knowledge of home literacy environments for children with intellectual disabilities and children who were typically developing, van der Schuit et al. (2009) used four questionnaires. Their questionnaires focused on children’s interests, shared book reading activities, child-focused literacy materials and activities, caregiver-focused literacy materials and activities, and expectations of child literacy development. The child participants included three groups. One group consisted of children age 3 to 5 years old with intellectual disabilities. A second group consisted of children 3 to 5 years old without disabilities. Children in these two groups were matched based on chronological age. The third group was comprised of children 3 to 5 years old without disabilities. Children in this group and the group of children with disabilities were matched based on mental age.

Breit-Smith et al. (2010) conducted phone interviews with 478 caregivers of children with disabilities and 478 caregivers of children without disabilities. The interviews contained five questions related to the caregivers’ home literacy practices and three questions related to their children’s emergent literacy skills.
Response rate

The response rates reported for 7 of the 10 identified studies ranged from 56% to 91.1%. Of the remaining three studies, Weikle and Hadadian (2003) reported a response rate of 36%; however, this response rate was based on 1,150 distributed questionnaires and, therefore, a large sample of 414 was obtained. Al Otaiba et al. (2009) posted their questionnaire on the research page of the National Down Syndrome Society website; therefore, a response rate was not provided. However, of the 159 respondents to the web-based survey, 107 met criteria for inclusion in their study. Lastly, Breit-Smith et al. (2010) conducted interviews with 956 participants selected from a larger pool of participants; therefore, no response rate was obtained.

Findings

As stated earlier, 6 of the 10 identified studies compared home literacy experiences of children with disabilities to home literacy experiences of children without disabilities. Results of these 6 studies suggested that caregivers of children with and without disabilities engaged in daily literacy activities (i.e., reading, writing, and drawing) with the same frequency, and the caregivers reported that reading was a favorite activity for their children (Light & Kelford-Smith, 1993; Marvin & Mirenda, 1993; Marvin & Wright, 1997; Weikle & Hadadian, 2003). In fact, when controlling for factors such as child age and family SES, there was no difference in the reported frequency of home literacy experiences between caregivers of children with disabilities and caregivers of children without disabilities (van der Schuit et al., 2009). However, when, caregivers of children with significant disabilities (i.e., severe speech and physical impairments) were compared with caregivers of children without disabilities, they reported spending more time at home engaged in activities of daily living (e.g., assisted eating) rather than early
literacy experiences (Light & Kelford-Smith, 1993; Marvin & Mirenda, 1993; Marvin & Wright, 1997; Weikle & Hadadian, 2003). When considering time spent reading independently, caregivers of children without disabilities reported that their children spent more time reading independently than did caregivers of children with disabilities. Specifically, children with physical disabilities reportedly spent less time reading independently and were more dependent on others for access to literacy materials (Light & Kelford-Smith, 1993).

When compared for initiating reading activities, caregivers of children without disabilities reported that their children initiated reading activities more often than caregivers of children with disabilities (Light & Kelford-Smith, 1993). Although writing was reported as a favorite activity for both groups of caregivers, the caregivers of children with disabilities reported that their children seldom engaged in writing activities (Light & Kelford-Smith, 1993), Caregivers of children with disabilities reportedly viewed mothers and teachers as the primary instructors of reading and writing (Light & Kelford-Smith, 1993). In contrast, caregivers of children without disabilities viewed only themselves (i.e., the children’s mothers and fathers) as their children’s primary instructors of reading and writing skills (Light & Kelford-Smith, 1993).

In the two studies that compared the home literacy experiences of 3 to 5 year old children enrolled in different education programs: Head Start programs for children from families of low SES, special education programs for children with disabilities, and peer model programs for children without disabilities who are participating as peer models in special education programs. This body of research showed differences in priority goals for the three groups (Marvin & Mirenda, 1993; Marvin & Wright, 1997). For example,
caregivers of children in Head Start programs and peer model programs identified their priority goals as learning to read and write, and making friends. In contrast, caregivers of children in the special education programs identified communication, self-help skills, and making friends as priority goals (Marvin & Mirenda, 1993). Most of the caregivers of children in the groups, however, predicted their children would have sufficient reading and writing skills to compete in college (Marvin & Wright, 1997). Caregivers of children in all three groups reported engaging in early literacy activities (e.g., singing songs, finger play, and telling stories without books) with their children. However, statistically significant differences existed between groups in the amount of commenting caregivers reported they did during television watching (Marvin & Mirenda, 1993). Caregivers of children in the Head Start program and caregivers of peer models more often reported commenting while watching television with their children than caregivers of children in the special education programs (Marvin & Mirenda, 1993). All three groups reported having access to reading material in the home and reading books with their children seated in their laps or next to them. However, caregivers of peer models and caregivers of children with disabilities more frequently reported having various types of reading materials in their home (e.g., newspapers, cookbooks, instruction manuals). Statistically significant differences also existed between groups in the frequency of the children’s attempts to communicate during shared book reading; that is, caregivers of children in the special education programs reported less frequently that their children asked questions and commented than caregivers of children in either the Head Start program or the peer model program (Marvin & Mirenda, 1993).
One of the 10 identified studies indicated that caregivers of children without disabilities more frequently reported using general literacy practices and technology to promote their children’s literacy development than caregivers of children with disabilities (Weikle & Hadadian, 2003). However, caregivers of children without disabilities more often reported a need for technology tools to promote literacy than the caregivers of children with disabilities (Weikle & Hadadian, 2003). The caregivers of children with disabilities also reported that their children’s disability and difficulties with communication were the greatest barriers to their children’s development of literacy skills; however, 84% of the caregivers who reported difficulties with communication as their child’s greatest barrier to developing literacy skills, indicated they had never used assistive technology devices (Weikle & Hadadian, 2003).

In contrast, van der Schuit et al. (2009) reported that more differences in home literacy experiences were evident when children had intellectual disabilities than when children had communication disabilities. Van der Schuit et al. (2009) compared caregiver-reported home literacy experiences of children with intellectual disabilities to caregiver-reported home literacy experiences of typically developing peers matched for mental age and typically developing peers matched for chronological age. Their results suggested that caregivers adapted their own communication to match their children’s developmental ages. Finally, these researchers found that caregivers of children with intellectual disabilities generally reported having lower expectations for their children’s literacy development than reported by caregivers of the peers who were matched for either mental age or chronological age.
In the studies of home literacy experiences for children with intellectual disabilities, 80% of the surveyed caregivers of preschoolers with Down syndrome reported having more than 50 children’s books at home and reading with their children a minimum 10 to 30 minutes daily (Al Otaiba et al., 2009). These results are similar to results reported for surveys of middle-class caregivers of children who are typically developing. In contrast, however, van der Schuit et al. (2009) found that caregivers of children with intellectual disabilities provided fewer reading, writing, and drawing activities than caregivers of children without disabilities.

The survey studies of children with sensory impairments showed that caregivers reported reading with their children at home and viewed literacy as a priority (Craig, 1996; Stobbart & Alant, 2008). Caregivers of children with visual impairments reported reading with their children an average of 3 to 4 times per week. Caregivers of children who used Braille reported visiting the library less often than caregivers of their children’s typically developing peers who used visual materials. Caregivers of children who had hearing impairments viewed communication and language as a higher priority than literacy, however they did not view sign language as a priority for their children’s development. In addition, the caregivers of children who were hearing impaired defined shared book reading more as a caregiver-directed activity than a child-directed activity (Stobbart & Alant, 2008).

One of the 10 identified studies compared home literacy experiences of 106 children with a single disability to home literacy experiences of 62 children with multiple disabilities (Marvin, 1994). Results suggested little differences between the two groups; the more disabilities the children had, however, the more different were their home
literacy experiences. Specifically, the amount and severity of children’s disabilities contributed to the level of priority their caregivers placed on literacy, the expectations caregivers had for their children’s literacy development, the location of the shared book reading session, the print materials presented during shared book reading, and the amount of assistance the children required during writing activities (Marvin, 1994).

In summary these 10 identified studies (see Table 2-1) showed that home literacy experiences for children with disabilities were different from the home literacy experiences of children without disabilities. Differences existed in the priority caregivers placed on literacy compared to other goals, the type of commenting and questioning caregivers used during shared book reading, and the technology used to facilitate the development of literacy skills (Al Otaiba et al., 2009; Light & Kelford-Smith, 1993; Marvin, 1994; Marvin & Mirenda, 1993; Marvin & Wright, 1997; Stobbart & Alant, 2008; Weikle & Hadadian, 2004).

The limitations of these studies were several. First, in studies that compared groups, the groups were unequal in number and often not matched for socioeconomic status. Second, questionnaires based on self-report might not accurately have represented the true home literacy practices of the families (Marvin, 1994). Third, access to one survey study questionnaire for caregivers of children with Down syndrome was available only on a website (Al Otaiba et al., 2009); thus, the sample was purposive rather than random. This might have skewed the results because the majority of the respondents had participated in higher education and used the Internet. This might not have been, therefore, a representative sample of caregivers of children with Down syndrome.
There are two main implications from these studies. First, caregivers of children with disabilities might benefit from information and resources related to the promotion of literacy and the use of technology to support their children’s development of emergent literacy skills (Weikle & Hadadian, 2004). Second, caregivers of children with disabilities might benefit from: (a) learning specific interventions related to questioning, and (b) recognizing opportunities for communication during early literacy experiences (i.e., shared book reading) with their children (Marvin & Wright, 1997).

**Interventions to Increase Emergent Literacy for Children with Disabilities**

Evidence suggests that emergent literacy leads to later (i.e., conventional) literacy and that early literacy experiences facilitate the development of emergent literacy skills. However, evidence also suggests that early literacy experiences for children with disabilities are different from the experiences of their peers who are typically developing. Researchers, therefore, have focused on identifying interventions conducted in the context of early literacy experiences for children with disabilities, with the intent of increasing their development of emergent literacy skills. This section outlines the steps taken to identify studies relevant to increasing emergent literacy skills in the context of early literacy experiences for children with disabilities. For these identified studies, this section also describes the characteristics of the participants, implementers of the intervention, the skills targeted, components of the interventions, characteristics of the research designs, and major findings. A summary of the findings across these studies and the strengths and limitations of these studies concludes the section.
Method to Identify Relevant Studies

Databases used to identify relevant articles for the review were: Academic Search Premier, CINAHL, ERIC, PsychINFO, Psychology and Behavioral Collection, and Sociological Collections. Search terms were: emergent literacy, disabilities, and young children. These terms resulted in 84 different references. From this list, relevant studies were selected based on five predetermined criteria: (a) the article was an empirical study; (b) most of the participants in the study were between the ages of birth to 5 years; (c) some of the participants in the study were described as having a disability or developmental delay; (d) the study was published in a peer reviewed journal between 1990 and 2010; and (e) the intervention was delivered during an early literacy experience. Of the 88 references, 84 did not meet the criteria. Specifically, four were duplicate references and 37 were not empirical studies. Of the remaining 43 references that were empirical studies, in 19 studies most of the participants were above the age of 5 years and 10 studies did not include children with disabilities. Finally, 14 studies were eliminated because they did not include an intervention or the intervention was not delivered during an early literacy experience. The application of these criteria resulted in four studies identified. The researcher then conducted hand searches of the reference lists from the four studies to locate additional articles to find other published research that might meet the five criteria. Hand searching through the 248 references listed in the four identified articles resulted in an additional 10 studies identified, therefore, a total of 14 studies met the criteria for inclusion in the review.

Study Characteristics

This section describes characteristics of the studies identified. Specifically, discussions are presented about the participants, implementers of the interventions, the
skills targeted and changes measured, components of the interventions, research
designs, reliability measures, and treatment fidelity.

Participants

Across the 14 identified studies, 194 children with disabilities and 18 children
without disabilities participated in the research (see Table 2-2). The chronological age of
the participants ranged from 28 to 84 months. Of these 14 identified studies, 13
collectively identified 198 participants as 57% (110) male and 43% (82) females. The
remaining study provided the 14 participants’ initials without reference to their sex.

Of the 194 child participants with disabilities across studies, 113 (58%) of
participants had mild to moderate language impairments, while 15 (8%) had severe
speech and physical impairments. Twenty-eight participants (14%) had intellectual
disabilities or Down syndrome. Sixteen (8%) of the participants were identified with
multiple risk factors (i.e., low SES plus a mild to moderate language impairment of
developmental delay). Finally, 22 (11%) of the participants had language impairment
plus another diagnosis, including global delays, autism spectrum disorder, tuberous
sclerosis, and chromosomal disorder.

Targeted skills and changes measured

In each of the 14 identified studies, the researchers used the context of an early
literacy experience to increase targeted emergent literacy skills for children with
disabilities, and in some cases children without disabilities. In reviewing these studies,
three categories of targeted skills emerged: (a) communication (71%; 10/14), (b)
participation during shared book reading (14%; 2/14), and (c) knowledge of
phonological awareness (14%; 2/14). For each of the categories, the following sections
will describe the skills targeted during the intervention and the measures used to detect changes in the targeted skills.

**Communication**

In 10 of the 14 identified studies, communicative behavior was identified as the targeted skill. To measure changes in communicative behavior, researchers in five studies measured overall frequency of communication attempts as in the number of communication turns (Crowe et al., 2004), or the number of communication acts (Hockenberger et al., 1999; Koppenhaver et al., 2001; Light et al., 1994; Trudeau et al., 2003) used by child participants during an early literacy experience (e.g., shared book reading). Researchers in 5 of the 10 studies measured changes in quality of communication acts such as the mean length of utterance (Crain-Thoreson & Dale, 1999; Dale et al., 1996; Davie & Kemp, 2002), frequency of multi-symbol utterances (Binger et al., 2008), and vocabulary (Hargrave & Senechal, 2000).

To collect data on the targeted skill of communication, researchers used different interventions. In 8 of the 10 studies (80%) targeting communication, researchers observed and coded videotaped sessions for child behaviors that had specific communicative intents (e.g., labeling, commenting, or asking a question) used by the children during shared book reading. Davie and Kemp (2002), however, examined language samples of children engaged in facilitated play and shared book reading to compare the effectiveness of language eliciting strategies in the two different contexts for children with intellectual disabilities and language delay. The researchers coded the number of intelligible utterances, the number of single morphemes used, and the type of interaction (imitation, response, or initiation). In contrast, one study that targeted communication used a formal assessment tool (i.e., Peabody Picture Vocabulary Test –
Revised) to measure changes in receptive vocabulary (Hargrave & Senechal, 2000) following the intervention.

**Participation during shared book reading**

In 2 of the 14 identified studies (14%) the researchers described specific interaction behaviors demonstrated during shared book reading as their targeted skills (Lovelace & Stewart, 2007; Saint-Laurent et al., 1998). Specifically, Lovelace and Stewart (2007) measured the children’s knowledge of concepts about print (i.e., knowledge of the forms of print, print conventions, and book conventions) demonstrated during participation in shared book reading. The researchers developed and administered a 20-item Concepts of Print Assessment adapted from Clay’s (1972) Concepts About Print assessment tool to measure change in children’s knowledge of concepts about print demonstrated before and after intervention. Alternatively, Saint-Laurent et al. (1998) measured five skills they believed demonstrated children’s knowledge of concepts about emergent literacy (i.e., interest in books and being read to, participation during shared book reading, orientation to the book, pretend reading, and knowledge that print has meaning) to evaluate their participation during shared book reading. The researchers developed and administered the Emergent Literacy Scale to measure differences in the children’s demonstration of these five skills before and after the intervention for children in kindergarten, day care, and home environments.

**Phonological awareness**

In 2 of the 14 identified studies (14%) researchers addressed behaviors that demonstrated phonological awareness in children with disabilities (van Bysterveldt et al., 2006) and children with multiple risk factors (i.e., from families of low SES and
language impairment) (Justice et al., 2003). These researchers used similar definitions of phonological awareness, although they used different terminology and named different components of phonological awareness. Van Bysterveldt et al. (2006) measured changes in only three components of phonological awareness (i.e., letter name and sound knowledge, print concepts, and initial phoneme identity) through formal assessments. The formal assessments were: (a) Letter Name Knowledge and Letter Sound Knowledge of the alphabet using the Gillon Preschool Phonology and Letter Knowledge Probes (Gillon, 2005); (b) initial phoneme identity task; and (c) a print concept task assessed using a preselected set of books. Justice et al. (2003) targeted five components of phonological awareness (i.e., alphabet knowledge, print awareness, name writing, phonological segmentation, and rhyme production) and measured changes in phonological awareness using the Kaderavek-Sulzby Rating of Orientation to Book Reading (Kaderavek & Sulzby, 2001).

Conclusions

The identified studies indicated that the emergent literacy interventions had a positive impact on the targeted skills of communication, participation during shared book reading, and knowledge of phonological awareness. In the majority of the identified studies the targeted skill was communication in the context of shared book reading with caregivers as the implementers particularly when the child participants’ primary disabilities were language impairment or severe communication impairment.

Intervention Components

As with the targeted skills, intervention components varied across the identified studies (see Table 2-4). The interventions addressed each of the targeted skill categories (i.e., communication, participation during shared book reading, and
phonological awareness). The components of the interventions used are described in the sections below.

**Communication**

In the 10 studies for which the researchers identified communication as the targeted skill, most interventions focused on creating opportunities for and facilitating communication. The following sections describe different interventions that were used to facilitate communication during early literacy experiences. The first set of interventions was used with children who have mild to moderate disabilities: (a) the Dialogic Reading Teaching Program (DRTP), (b) context, (c) other communication interventions focused on children with mild to moderate language impairment. The second set of interventions was used with students with moderate to significant disabilities to facilitate communication.

**Dialogic Reading Teaching Program used with children who have mild to moderate disabilities.** In 3 of these 10 studies the researchers instructed caregivers on the use of the Dialogic Reading Teaching Program (DRTP) developed by Whitehurst et al. (1988) (Crain-Thoreson & Dale, 1999; Dale et al., 1996; Hargrave & Senechal, 2000). The DRTP is an intervention designed to improve communication during shared book reading for children in Head Start, who do not have disabilities. The components of the DRTP intervention are: asking questions, following responses with another question, repeating what the child says, helping the child as needed, encouraging with praise, following the child’s interest, asking open-ended questions, and expanding child utterances. All three of these studies used group designs and implemented the DRTP intervention with children age 3 to 6 years with mild to moderate language impairments. In the first study, Dale et al. (1996) randomly assigned children ages 3 to 6 years of age
to either a group for which caregivers were taught to implement the DRTP intervention during shared book reading at home or a control group for which caregivers were taught to implement a Conversational Language Training program during facilitated play at home. A comparison of pre- and post-test scores showed statistically significant main effect differences for caregiver behaviors between the two groups. Caregivers in the DRTP group used more wh-questions, imitation, and open-ended questions, while caregivers in the Conversational Language Training program group used expansions more. A comparison of pre- and post-intervention data on the children’s behavior showed statistically significant differences between the two groups only for the number of words the children used, with a higher number of different words used by children in the DRTP group. They also found, however, that caregivers of children with language delays often did not give their children enough time to respond to questions.

In the second study, Crain-Thoreson and Dale (1999) addressed the issue of response time by modifying the DRTP intervention to add the component of waiting for their children to respond and teaching caregivers and school staff (i.e., teachers, paraprofessionals) to use this modified DRTP intervention with children who had language impairments. Comparisons of pre- and post-assessments and observations showed that when caregivers and school staff received instruction on the modified DRTP intervention and changed their shared book reading behaviors, scores improved on language assessments for their participating children. Results indicated statistically significant differences between caregivers and school staff, however, in their verbatim reading of the text during shared book reading, with caregivers engaging in verbatim reading of the text with their children more frequently than school staff. In addition, the
children whose caregivers and school staff received instruction on the DRTP intervention used more language and elaborated more during shared book reading than the children whose caregivers and school staff received no instruction on the intervention. There was no statistically significant change, however, in vocabulary test scores for children in either group.

In the third study, Hargrave and Senechal (2000) studied the use of the DRTP intervention with 36 children in preschool settings. They found that the implementers (i.e., teachers) who received instruction on the DRTP intervention (i.e., DRTP group) used significantly more wh-questions during shared book reading than the teachers who did not receive the instruction (i.e., regular reading group). Regarding children’s receptive vocabulary, no statistically significant difference was found between children in either the DRTP group or the regular reading group. However, statistically significant main effects for the regular reading group were observed for book vocabulary and expressive vocabulary.

Context as intervention for children with mild to moderate disabilities. In 3 of the 10 (30%) identified studies focused on communication researchers concentrated on the impact of the context in which intervention was implemented. In both Dale et al. (1996) and Davie and Kemp (2002) compared the impact of intervention delivered in the context of shared book reading with the context of facilitated play. Specifically, they sought to determine which of the contexts was more conducive to children’s use of intelligible utterances, morphemes, and communicative interaction.

Dale et al. (1996) examined differences in communicative behaviors between two groups of children with intellectual disabilities and language impairment. One group
consisted of children whose caregivers received instruction in DRTP for use during shared book reading at home. The other group consisted of children whose caregivers were taught to use Conversational Language Training during facilitated play at home. The child participants in their study had intellectual disabilities and language impairment. In both Dale et al. (1996) and Davie and Kemp (2002), significant differences were found in the children’s communicative behaviors in the two contexts. The results showed that in the context of shared book reading the children used a higher number of different words (Dale et al., 1996), and more utterances and morphemes (Davie & Kemp, 2002) than in the context of facilitated play.

In the third study, Light et al. (1994) compared children’s communicative behaviors in the context of shared book reading with a familiar book to children’s communicative behavior in the context of shared book reading with an unfamiliar book. They sought to determine whether children with severe speech and motor impairments used more communicative behaviors in one of the two contexts. They found that children’s communication was similar in each context; however, children engaged in pretend reading (i.e., children looking at the book and imitating reading) more frequently in the context of shared book reading with familiar books.

Other communication interventions for children with mild to moderate language impairments. In 2 of the 10 (20%) identified studies focused on communication researchers examined the impact of other types of intervention to facilitate communication in children with mild to moderate language impairments. In the first study Crowe et al. (2004) taught caregivers to use a complete reading cycle to increase their children’s communicative behaviors. A complete reading cycle between
caregivers and their children has four components: establishing joint focus, the caregiver asking his/her child questions, the caregiver pausing for or prompting a response from the child, and the caregiver giving feedback on the children’s responses. The complete reading cycle intervention was based on the hypothesis that, in order to accommodate for their children’s limited communication, caregivers often insert communicative behaviors when their children are expected to participate during shared book reading. Their results showed increases in the children’s communicative turn taking, frequency and types of words used, and story initiations following caregiver instruction on the complete reading cycle.

In the second study Hockenberger et al. (1999) instructed caregivers of low SES to use six specific comments for each book they read with their children during shared book reading. The caregiver-generated comments related to either the content of the book or their children’s own experiences. In addition to their family’s low SES, three of the seven child participants also had mild to moderate developmental disabilities. The results showed that when the caregivers used these specific comments during shared book reading, the frequency with which their children responded to comments and initiated comments increased.

**Interventions used with children who have significant disabilities.** In 3 of the 10 studies the intervention addressed instructing caregivers to implement an intervention during shared book reading with their children with significant disabilities. In the first study, Koppenhaver et al. (2001) taught caregivers of six girls with Rett syndrome to: (a) attribute meaning to their children’s attempts to communicate; (b) prompt their children’s use of their augmentative or alternative communication (AAC)
device; (c) provide sufficient wait time for their children to respond; (d) ask their children questions; and (e) comment about the shared book reading. Their results showed that when caregivers implemented the intervention during shared book reading, their daughters’ frequency of commenting and labeling increased, as did their daughters’ communication using their AAC device.

In the second study, two graduate students in speech pathology modeled for caregivers the use of the intervention during shared book reading with groups of children (Trudeau et al., 2003). In a two-step process, the graduate students first taught the caregivers to program their children’s AAC devices. The caregivers then observed the graduate students using the intervention during shared book reading with a group of their children embedding the children’s use of AAC devices in the activity. The caregivers, however, were not specifically taught to use the strategies contained in the intervention. The strategies were: (a) use adapted materials such as books and AAC devices; (b) use props to encourage physical involvement; (c) provide opportunities for children to communicate; (d) prompt; (e) model use of AAC devices; and (f) scaffold. The results suggested that caregivers of children who were typically developing and caregivers of children with disabilities benefited from observing the implementation of the intervention during group sessions led by the instructors. All child participants increased their use of photo reading (i.e., describing pictures in the book). Modeling of the specific strategies improved the proportion of participation of children with disabilities relative to the participation of their caregivers. However, there was a limited amount of questioning observed from the children with disabilities (Trudeau et al., 2003). Furthermore, the children with disabilities used the adaptations more than the
children who were typically developing used the adaptations. The children with
disabilities also relied on adults more for opportunities to participate in shared book
reading than the children who were typically developing did.

In the third study, Binger et al. (2008) taught caregivers to program and use the
device their children’s AAC devices, and to use four strategies to support their children’s
communication of multi-symbol utterances with the use of their AAC devices during
shared book reading. These strategies were: (a) reading the text and modeling use of
their children’s AAC device using two symbols; (b) asking wh-questions and modeling
the use of their children’s AAC devices to answer those questions with phrases using
two symbols; (c) answering questions and modeling the use of their children’s AAC
devices to two symbols; and (d) pausing before modeling the use of their children’s AAC
device, to provide enough time for children to respond. The researchers found that that
when caregivers modeled use of multi-symbol utterances using their children’s AAC
device, the children’s frequency of multi-symbol utterances increased. Even during
generalization probes with new books and maintenance probes conducted at 2, 4, and 8
weeks following the generalization probes, the children continued to use a minimum of
10 multi-symbol utterances during 10-min reading sessions and caregivers continued to
use the intervention with at least 80% accuracy.

**Participation during shared book reading**

Two of the 14 (14%) identified intervention studies focused on participation during
shared book reading (Saint-Laurents et al., 1998; Lovelace & Stewart, 2007). In the first
study, Saint-Laurent et al. (1998) compared two groups of children who had intellectual
disabilities. Caregivers of children in the experimental group attended a three-hour
workshop on the importance of: (a) modeling literacy use in natural environments; (b)
exploring literacy materials; and (c) reading daily with their child. The children in the experimental group participated in shared book reading regularly with their caregivers, and case managers visited their caregivers weekly to answer questions regarding use of the interventions. Caregivers of children in the comparison group received no instruction during the study. Results showed statistically significant differences between the experimental and control groups for pretend reading only. Assessments addressed children’s interest in books, participation in reading, name recognition, and print awareness. Treatment fidelity results indicated that caregivers were compliant with the intervention strategies; however, results of the children measures were modest.

In the second study, Lovelace and Stewart (2007) used scripted input during shared book reading sessions. For this intervention, the first research conducted all of the sessions and used an intervention that was designed to increase children’s knowledge of print concepts. The intervention was scripted input strategies consisting of: commenting on the book, tracking words with a finger, and pointing to 20 print-related concepts during shared book reading. The researcher implemented the strategies with five preschoolers with language impairments. Children, participating in the study, demonstrated an increase in their knowledge of print concepts during generalization. Generalization was assessed by presenting the 20 print-related concepts in a different order and asking the children to demonstrate their knowledge of print concepts using a different task. However, the results obtained during the intervention phase were variable and not all children participated in the study for the five intervention probes.
Two of the 14 (14%) identified intervention studies focused on target skills that demonstrated phonological awareness (Justice et al., 2003; van Bysterveldt et al., 2006). In Justice et al. (2003), a reading teacher and a speech-language pathologist implemented two interventions with two groups of children who had multiple risk factors (i.e., from families of low SES, mild-to-moderate language impairments). Prior to beginning the intervention phase, assessments of the children’s oral language and orientation to literacy were conducted. The children in one group (i.e., experimental explicit intervention) engaged in the activities of name writing, alphabet recitation, and phonological awareness games. The children in the second group (i.e., comparison intervention) engaged in adult-child shared book reading and story retelling activities. While children in both groups showed improved growth in phonological awareness across the 12-week intervention, there were no statistically significant differences between the groups. Although, children in the experimental explicit intervention showed significant improvement for each of the five phonological awareness tasks, the children in the comparison intervention group showed significant improvement in only one of the five phonological awareness tasks: phonologic segmentation. The results also suggested that oral language proficiency and orientation to literacy were strong predictors of emergent literacy in children with multiple risk factors (i.e., from families of low SES and language impairment).

In the second study, van Bysterveldt et al. (2006) taught caregivers to draw their children’s attention to four letters and the corresponding letter sounds during shared book reading. Of the 14 children who participated, 7 children were typically developing and seven had Down syndrome. The results of the 6-week intervention showed
significant treatment effects for phonological awareness (i.e., letter sound knowledge; initial phoneme identity) and print concepts but not for letter naming. The children with Down syndrome showed the same or greater amount of change between pre- and post-test scores, as their age-matched peers who were typically developing.

**Conclusions**

In the identified studies described, researchers used different types of interventions to address emergent literacy for children with disabilities. Collectively these studies indicate that emergent literacy interventions targeting communication, participation during shared book reading, and knowledge of phonological awareness have been implemented with children who have mild to moderate disabilities. However, research focused on emergent literacy interventions for children with significant disabilities have only addressed communication.

**Intervention Implementers**

For the 14 identified studies, the implementers of the interventions varied (see Table 2-3). Implementers of the interventions were: only professionals, only caregivers, or both professionals and caregivers. This section describes the implementers of the interventions across the identified studies.

**Both professionals and caregivers as implementers**

In 3 of the 14 identified studies, (21%) both caregivers and professionals implemented the emergent literacy interventions (Crain-Thoreson & Dale, 1999; Hargrave & Senechal, 2000; Trudeau, Cleave, & Woelk, 2003). In the first study, Crain-Thoreson & Dale (1999) taught caregivers and professionals (i.e., school staff) to use a modified Dialogic Reading Teaching Program (DRTP) over an 8-week intervention period. To learn the intervention, caregivers and teachers attended two 1.5-hr sessions
that were 4 weeks apart. In addition, the researchers identified school staff that received no instruction on the intervention. The researchers then randomly assigned 34 preschool children with language delays to one of three groups for shared book reading. In one group, the caregivers who received instruction provided the intervention using the modified Dialogic Reading Teaching Program; in the second group, the school staff who received instruction provided the intervention with modified DRTP; and in the third group, the school staff who received no instruction engaged in shared book reading. The purpose of their study was to compare the effectiveness of caregiver- and school staff-implemented modified DRTP when both sets of implementers received instruction on the intervention, and when school staff had not received instruction. Results showed that both sets of implementers who had received instruction were effective in delivering the DRTP interventions.

In the second study, Hargrave and Senechal (2000) taught both caregivers and professionals (i.e., day care staff) to implement the Dialogic Reading Teaching Program (DRTP) during shared book reading either at home or in day care centers with preschoolers who had poor expressive vocabulary skills. In one of the participating centers, day care staff received 1 hr of instruction on the DRTP. In another center, day care staff received no instruction. Caregivers of the children in both centers received the same instruction in DRTP as the day care staff from one center. Results showed that for the children in the groups where caregivers and day care staff received instruction in DRTP there were statistically significant differences between pre- and post-test scores on the children’s knowledge of both the book vocabulary and standardized vocabulary tests.
Finally, in the third study, Trudeau et al. (2003) observed four dyads at home during shared book reading with the embedded use of AAC devices. Two of the dyads were of caregivers and their children who were typically developing and two dyads were of caregivers and their children who had multiple disabilities. The children also were observed together in a clinic setting during 60-90 min group sessions of shared book reading with embedded use of their AAC devices. These group sessions were conducted once each week for 6 weeks. Professionals (i.e., graduate students) conducted the group sessions and modeled the use of both the shared book reading interventions and the embedded use of AAC devices for the caregivers. The caregivers observed the group sessions of shared book reading but received no formal instruction on the use of the intervention or embedded use of the AAC devices prior to being observed during shared book reading with their children at home. The caregivers did receive instruction on how to program their children’s AAC devices prior to the intervention. As a result, the caregivers’ use of the intervention and their children’s AAC devices increased. In addition, the children’s frequency of pretend reading behaviors increased and the children with the most severe disabilities used the AAC devices most, relying on their caregivers to provide opportunities for them to participate in shared book reading.

Professionals as implementers

In 3 of the 14 studies (21%), only professionals (i.e., school staff, clinician, or researcher) implemented the intervention (Davie & Kemp, 2002; Justice, Chow, Capellini, Flanigan, & Colton, 2003; Lovelace & Stewart, 2007). In the first study, Davie and Kemp (2002) instructed two special education teachers and one early childhood teacher to elicit language from 22 children with multiple disabilities in two contexts within
an inclusive early childhood center: facilitated play and shared book reading. The children ranged in age from 4 to 6 years and each was identified as having multiple disabilities (i.e., autism spectrum disorder, Down syndrome, global delays). The purpose of their study was to determine if, when activities were directed by professionals, differences existed between the impacts of the two contexts on the children’s communicative behaviors (i.e., number of intelligible utterances, number of morphemes in each utterance, number of initiations, responses, and imitations). Overall, the researchers found a statistically significant difference between the two contexts (i.e., facilitated play and shared book reading) in the number of intelligible utterances the children used, regardless of their implementers, with more utterances used during shared book reading.

In the second study Justice et al. (2003) had a speech pathologist and a reading specialist implement instruction. Collaboratively these professionals delivered two different emergent literacy interventions, each for a 6-week period; that is, they implemented first one intervention for a 6-week period, then the second intervention for a 6-week period. Both of the interventions were delivered during twelve 30-min small group sessions in preschool classrooms that served 18 children from families of low SES. Of these preschoolers, 13 children also had mild speech and language impairments. The purpose of their study was to determine which emergent literacy intervention was more effective for the 13 preschoolers who had multiple risk factors (i.e., from families of low SES and language impairment). Results showed significant differences between all pre- and post-measures of emergent literacy for the first intervention, but only one of the measures for the second intervention. Because the
implementers were consistent across interventions, it could be inferred that the differences in effectiveness were the results of the differences between the interventions rather than the implementers of the interventions.

In the third study, the first of two researchers implemented the intervention for the entire study (Lovelace & Stewart, 2007). Specifically, the first researcher conducted all of the shared book reading sessions that comprised a 13-week study. The purpose of this study was to determine if five children, 3 to 5 years old and with mild language impairments, could learn print concepts via an intervention comprised of: commenting on the book, tracking words with a finger, and pointing to 20 print-related concepts during shared book reading. The implementer of the intervention explicitly described print-related concepts (i.e., title of the book, author of the book, where to begin reading on the page) during 10-min sessions. The implementer collected data on the percent of accuracy on the 20 print-related concepts using a criterion-referenced tool adapted from Clay’s (1972) Concepts about Print task. Results showed that all five participants demonstrated an increase in their knowledge of print concepts after only four shared book reading. Although generalization probes, obtained using a different order of tasks and different method for demonstrating the task for the criterion-referenced tool, showed a decrease in knowledge of print concepts for all participants, the generalization data were at a higher level than baseline.

**Caregivers as implementers**

Researchers also have studied the effectiveness of emergent literacy intervention when implemented by caregivers. As shown in Table 2-3, caregivers were the sole implementers of the intervention in 57% (8/14) of the studies identified (Binger, Kent-Walsh, Berens, Campo, & Rivera, 2008; Crowe, Norris, & Hoffman, 2004; Dale, Crain-
All of the interventions using caregivers as the sole implementers were conducted during the early literacy experience of shared book reading in their homes. The researchers instructed the caregivers to use the intervention during instructional sessions that differed in format, frequency, and intensity. In a study by Saint-Laurent et al. (1998) the format for instructing the caregivers on the intervention involved one 3-hr session in which the researchers demonstrated the strategies to be used and provided written information to support the intervention. In addition, Saint-Laurent et al. (1998) monitored and supported the caregivers through weekly home visits over 8-months in which the strategies were reviewed and the caregivers were encouraged to continue to use the strategies.

In a study by Koppenhaver et al. (2001) the caregivers were: (a) instructed on the intervention as the researchers modeled each strategy, (b) provided with feedback from the researcher as they practiced the strategy with their child, (c) provided an opportunity to ask questions with feedback from the researcher, and (d) provided written information about the intervention. Crowe et al. (2004) instructed the caregivers using the same procedures as Koppenhaver et al. (2001), however, following the initial instruction, the researchers provided coaching during a 10-min caregiver-child shared book reading session. Coaching was included in the first four sessions, then omitted for the remaining 8 to 10 training sessions during the 5-week study.

In three of these eight studies, the caregivers were: (a) instructed on the intervention, (b) shown a video of another caregiver implementing the same
intervention, (c) provided an opportunity to ask questions with feedback from the researcher, and (d) provided written information about the intervention (Dale et al., 1996; Hockenberger et al., 1999; van Bysterveldt et al., 2006). No coaching or direct feedback was provided for the caregiver who implemented the intervention with the child.

Binger et al. (2008) instructed caregivers to use a cognitive strategy approach that included eight steps. These eight steps consisted of a pretest for the caregivers about the strategies, the researchers describing and demonstrating the strategies, the caregivers verbally practicing the strategies followed by practice implementing the strategies with the researcher, the caregivers practicing in the natural context with the children, a post-test, and finally the caregivers generalizing the strategies to other contexts.

Regarding the frequency and intensity of the instruction, in 88% (7/8) of the studies for which caregivers were the implementers, the caregivers attended researcher-led instructional sessions that ranged in duration from 20 min to 3 hrs, and varied in frequency from one session (van Bysterveldt et al., 2006) to as many sessions as needed (up to 2.7 hrs) until the caregivers reached an accuracy criterion (Binger et al., 2008). In one study, the caregivers read familiar books (i.e., books they had read many times before with their children) and unfamiliar books (i.e., books they had not read before their children) in random order during shared book reading (Light et al., 1994). Regardless of the format, frequency, or intensity of their instructional sessions, caregivers were effective implementers of the interventions with their children as evidenced by their children’s changes in emergent literacy behaviors.
Conclusions

The results from these studies collectively show that when professionals and caregivers of children with disabilities were instructed to implement interventions during early literacy experiences, their children increased their emergent literacy skills. The use of the interventions led to changes not only in the children’s use of emergent literacy skills, but also in the implementers’ behaviors during early literacy experiences.

Research Designs, Reliability, and Treatment Fidelity

Eight of the 14 (54%) identified studies used single-subject experimental research designs to determine the effectiveness of emergent literacy interventions (see Table 2-4). Seven of these eight studies used a multiple baseline design across either participants or behaviors, and one study used within-subjects alternating treatments design. The remaining six of the 14 identified studies used group design methods to compare different interventions, or to compare a treatment condition with a non-treatment condition.

Reliability is discussed in this paragraph in two ways: (a) interrater reliability for studies using single subject research design, and (b) reliability for studies that used group design. Interrater reliability was reported for each of the eight studies using a single subject research design to determine the level of consistency in raters’ coding of observations of participants’ behaviors. The range of scores for interrater reliability for these eight studies was 0.69 to 0.98, although the guideline for acceptable interrater reliability traditionally is 0.80 (Kazdin, 1982). Reliability for seven of the eight studies was above 0.80.

Reliability was reported for two of the six identified studies using group design. The range of scores for these two studies was 0.79 to 0.98 for the formal assessment
protocols used to determine the effects of the interventions (Crain-Thoreson & Dale, 1999; Davie & Kemp, 2002). For these two studies, coefficients were within the acceptable range of reliability.

Treatment fidelity data are reported to determine the degree to which interventions were implemented in accordance with the predetermined interventions. Treatment fidelity was reported for 6 of the 14 (43%) identified studies, with a range of 78% - 98%, although traditionally a level of 80% is acceptable. Fidelity was obtained at or above the 80% level in four of the studies. These data led the researchers to conclude that the professionals and caregivers implemented the interventions as intended.

**Findings Related to Emergent Literacy Interventions**

Several findings emerged from studies in this literature review. First, the identified studies collectively indicate that, regardless of the intervention components or the implementers of the intervention, the selected emergent literacy interventions had a positive effect on the targeted skills of communication, participation in shared book reading, and phonological awareness of children both with and without disabilities.

Second, the collective results from the studies suggest that children with disabilities used utterances that were more intelligible, complex, and frequent during shared book reading than during facilitated play activities (Dale et al., 1996; Davie & Kemp, 2002). This difference was evident whether caregivers or professionals implemented the interventions.

Third, overall the results indicate that regardless of the intervention, when professionals and caregivers of children with disabilities were taught to use specific interventions; that is, a complete reading cycle (Crowe et al., 2004), Dialogic Reading (Dale et al., 1996; Hargrave & Senechal, 2000), modified Dialogic Reading (Crain-
Thoreson & Dale, 1999), and comments that relate book content to the children’s experiences (Hockenberger et al., 1999) during shared book reading, and the children’s use of communicative behavior increased. Specifically, there were increases in the children’s mean length of utterance and number of different words used during shared book reading.

Fourth, the identified intervention studies that were focused on children with significant disabilities indicate that the interventions used with these children typically contained different components than the interventions used with children with mild to moderate disabilities. In addition, the interventions were focused on communication, rather than other emergent literacy components such as phonological awareness. For example, the intervention components included scaffolding techniques, prompts, and AAC devices modeled by caregivers to facilitate their child’s communication during shared book reading (Binger et al., 2008; Koppenhaver et al., 2001; Light et al., 1994; Trudeau et al., 2003). Overall, the studies showed that caregivers of children with significant disabilities were able to implement interventions in the home during shared book reading sessions that resulted in an increase in the children’s use of communicative behaviors.

A fifth finding was that shared book reading participation and phonological awareness increased when implementers were taught to use interventions (Saint-Laurent et al., 1998; van Bysterveldt et al., 2006). The children participating in these studies had mild to moderate disabilities.

A final finding was related to the use of familiar books versus unfamiliar books during shared book reading. Two studies compared children’s communication in the
context of familiar books used during shared book reading and in the context of unfamiliar books (Light et al., 1994; Saint-Laurent et al., 1998). The results suggest that this was not a significant variable for increasing children’s communication during shared book reading.

**Summary of the Literature**

In summary, the identified studies show that emergent literacy interventions are one method for increasing children’s communication, participation during shared book reading, and phonological awareness. Furthermore, whether conducted in the home or day care center, intervention conducted in the context of shared book reading influences the communicative behaviors used by children with significant disabilities. In the identified studies, researchers instructed caregivers and professionals to implement various emergent literacy interventions in the context of one type of early literacy experience (i.e., shared book reading). Collectively these studies indicated that shared book reading is an effective early literacy experience for improving emergent literacy skills in children with disabilities. However, research on the effects of early literacy experiences (i.e., shared book reading) on emergent literacy of children birth to 36 months is limited. Participant ages in the identified studies ranged from 28 to 80 months, with the lowest mean age of 39.1 months. In only one study were child participants under 36 months. Light et al. (1994) compared caregiver and child communicative behaviors in the context of using a familiar book to the context of using an unfamiliar book; this intervention did not focus on instructing caregivers of child participants in the study to implement specific strategies targeting their child’s communication. Given that caregiver-implement intervention has had a positive impact on the communication of children with disabilities 3 to 5 years old, it seems logical to
examine next the impact of caregiver-implemented intervention on the communication of children birth to 36 months with disabilities.

**Strengths**

Several strengths of using early literacy experiences to improve emergent literacy for young children with disabilities are evident in the studies reviewed. First, all of the researchers reported a positive impact of the selected interventions on emergent literacy for children with disabilities. Second, researchers reported that both caregivers and professionals from a variety of settings (i.e., homes, day cares, and early intervention centers) received instruction on implementing intervention across settings. Finally, some researchers in the identified studies examined the maintenance and generalization of the skills learned by the children. Specifically, in one study the researchers conducted generalization probes with new books and maintenance probes at 2, 4, and 8 weeks after the generalization probes (Binger et al., 2009). In another study, the researchers conducted maintenance probe one-week after the final intervention session (Crowe et al., 2004). In one other study, researchers conducted generalization probes to determine if the children generalized their use of communication across implementers of the intervention (Trudeau et al., 2003).

**Limitations**

Seven limitations were noted in the identified studies. First, some interventions (i.e., Dialogic Reading Teaching Program) were found to be effective for children mild to moderate disabilities, some of which came from families of low SES. The effectiveness of these research-based interventions, however, has not been investigated systematically with children who have significant disabilities. This is a limitation because
no research-based interventions have been established for increasing emergent literacy for children with significant disabilities in the context of early literacy experiences.

Second, four of the 14 (29%) identified studies focused on children with significant disabilities while 10 of the 14 (71%) focused on children with mild to moderate disabilities (i.e., language impairment, Down syndrome, or intellectual disability). In fact, the criteria for participation in some studies specifically excluded children with severe or multiple disabilities or complex disability characteristics such as autism (Davie & Kemp, 2002; Saint-Laurent et al., 1998; van Bysterveldt et al., 2006). The studies that focused on emergent literacy interventions for children with a variety of disability characteristics were limited. For instance, while one study did include children with a variety of disability characteristics (e.g., autism, global delays, and Down syndrome) (Davie & Kemp, 2002), the results were not disaggregated by disability and the functional abilities of the children were not described. If the results had been disaggregated, differences in the results might have been observed between groups of children with differing characteristics. Such disaggregate data might provide information on the relative effectiveness of specific interventions or intervention components on behaviors that reflect emergent literacy for children with specific characteristics.

Third, the four identified studies with children with severe communication and physical impairments totaled 15 participants. This limited number of participants warrants continued research on emergent literacy intervention for this population.

Fourth, components of the related interventions used in these 14 identified studies were similar across some of the studies. This has resulted in the lack of research to support the identification of either an emergent literacy intervention or specific
components across interventions, as evidence-based for children with significant disabilities.

Fifth, because emergent literacy develops through social interactions in the context of early literacy experiences, the ability to jointly focus attention on literacy is essential. The literature suggests that joint attention may develop atypically for children with communication impairments and other developmental differences (Kaderavek & Rabidoux, 2004). In spite of this literature, the establishment of joint attention during in the context of the early literacy experiences was not incorporated into the interventions of any of the 14 identified studies. In addition, the use of proto-declarative bids for joint attention has been identified as a prognostic indicator for the development of communication in children with developmental disabilities (Yoder, et al., 1998).

Sixth, according to DeBaryshe (1993) the age at which shared book reading begins influenced language skills more than the frequency of shared book reading. While 13 of the 14 (93%) identified studies focused on children who were from 36 to 80 months old, only one study included children less than 36 months of age (Light et al., 1994).

Finally, generalization and maintenance of skills are serious issues for children with significant disabilities. Unfortunately, only three of the 14 (21%) identified studies included data to assess the children’s generalization or maintenance.

**Future Directions**

Results of the 14 identified studies showed increases in communicative behavior, participation during shared book reading, and behaviors that demonstrate phonological awareness for children with disabilities when professionals and caregivers implemented emergent literacy interventions during an early literacy experience. Future research in
the area of emergent literacy interventions for children with disabilities should address the strengths and limitations of the current research. The next steps to extend the research are to examine: (a) the use of caregiver-implemented emergent literacy interventions with children with significant disabilities; (b) the effectiveness of emergent literacy interventions with children birth to 36 months who have developmental delays; (c) the use of caregiver-implemented interventions focused on early communicative behaviors (i.e., pre-symbolic); and (d) the maintenance of the caregiver use of the interventions over time of the effects of the caregivers’ use of the emergent literacy interventions for young children with significant developmental delays. Each of these is addressed in the proposed study.

The literature suggests that early literacy experiences (i.e., shared book reading) provide opportunities to establish joint attention, take turns, and stimulate communication through pictures, and provide a natural beginning and end to an activity (Ninio, 1983; Ninio & Bruner, 1978). These features of shared book reading establish a predictable context in which communication can occur and interventions can be implemented. Research also has shown that for children with disabilities, and specifically children with communication impairments, the context of shared book reading is conducive to communication. For children with significant disabilities the research indicates that when caregivers and professionals implement interventions with fidelity, children’s use of communicative behaviors increases. Furthermore, researchers have shown the use of caregiver-implemented emergent literacy interventions to be effective for young children without disabilities. For example, Arnold, Lonigan, Whitehurst, and Epstein (1994) showed that for children who were 2 years old, Dialogic
Reading Teacher Program strategies were effective during shared book reading with caregivers at home.

Components of emergent literacy interventions have varied when they have been used with children who have significant disabilities although increasing communication remained the targeted skill. Of the 15 participants in the four identified studies focused on children with significant disabilities, eight children had severe speech and physical impairments and seven children were diagnosed with an autism spectrum disorder including Rett syndrome and pervasive developmental disorder. Each of these participants had different characteristics, which might have affected the way they responded to the interventions. For example, in one study the results were not disaggregated for children with autism spectrum disorders, global delays, or Down syndrome. Therefore, the impact of the intervention on children with similar limitations, characteristics, type, and severity was unknown (Davie & Kemp, 2002). In contrast, all of the participants in a different study had Rett syndrome and the interventions were designed to address their unique characteristics (Koppenhaver et al., 2001). The interventions might need to be tailored to match the needs of children who share similar limitations, although their health conditions might be different. Therefore, future research should address matching the interventions to children with certain characteristics.

In 11 of the 14 (79%) identified studies, caregivers implemented the interventions in their child’s natural environment (i.e., homes) during a typical early literacy experience (i.e., shared book reading). Instructing caregivers to implement emergent literacy interventions in the natural environment might facilitate generalization and
maintenance of the children’s targeted skills to other early literacy experiences and daily routines (i.e., play, bath time, meal time). To determine whether young children with significant developmental delays can generalize and maintain the communicative behaviors they learned during shared book reading, future research should include maintenance and generalization phases.

The purpose of the proposed study is to determine: (a) if instruction in caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions. The following research questions are addressed:

a) Is instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) functionally related to the caregivers’ use of initial and follow-up prompting strategies with their children age 18 to 34 months with significant developmental delays?

b) Is the caregivers’ use of the shared book reading intervention associated with changes in their children’s use of communicative forms and functions during shared book reading sessions?

c) Do caregivers maintain their use of the caregiver-implemented shared book reading intervention with their children at 2 weeks and four-weeks following the intervention phase?

d) Do children age 18 to 34 months with significant developmental delays maintain their use of communicative forms and functions during shared book reading sessions at 2 weeks and 4 weeks following the intervention phase?

e) Does the use of caregiver-implemented shared book reading intervention affect the duration of shared book reading sessions?
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<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Print awareness in connected discourse – ability to recognize text independent of the context</td>
<td>Understanding the functions of print – letter knowledge, phonological awareness, letter-sound correspondence, and word recognition</td>
<td>Phoneme-grapheme correspondence – letter-sound knowledge</td>
<td>Procedural knowledge of emergent literacy – pre conventional spelling, letter knowledge, letter sound knowledge, and word reading</td>
<td>Alphabet knowledge – nature of print symbols</td>
<td>Level 1: Attention and responsiveness during literacy interactions</td>
<td>Print knowledge – alphabet knowledge, concepts about print, &amp; early decoding</td>
</tr>
<tr>
<td>Knowledge of forms and functions of written text – writing resembles conventional forms and assigns meaning</td>
<td>Writing and composing – write words, dictate sentences, &amp; compose stories</td>
<td>Phonological awareness – knowledge of rhyme and syllables</td>
<td>Metalinguistics – phonological and syntactic awareness</td>
<td>Phonological awareness – sound structure of oral and written language</td>
<td>Level 2: Balance and turn-taking during literacy interactions</td>
<td>Reading readiness – alphabet knowledge, concepts about print, vocabulary, memory, &amp; phonological awareness</td>
</tr>
</tbody>
</table>

Figure 2-1. Components of emergent literacy models
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Print awareness in situational contexts – knowledge of print within a specific context.</td>
<td>Concepts and functions of literacy – knowledge of reading rules, functions of print, &amp; environmental print</td>
<td>Narrative – production of written narrative</td>
<td>Conceptual knowledge of emergent literacy – knowledge about the act of reading and writing, functions of print, knowledge of print in context</td>
<td>Print awareness – role of print as a communication device</td>
<td>Level 4: Conventional literacy support by social interaction</td>
<td>Concepts about print: knowledge of print concepts conventions</td>
</tr>
<tr>
<td>Oral language associated with text – talking about written language</td>
<td>Listening comprehension and word understanding</td>
<td>Language – vocabulary, and narrative knowledge</td>
<td>Language – vocabulary, narrative knowledge, comprehension</td>
<td>Oral language – language comprehension, vocabulary, &amp; grammar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metalinguistics – talking about written language process</td>
<td></td>
<td></td>
<td>Metalinguistic awareness – vocabulary used to talk about written text</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2-1. Continued
Table 2-1. Studies comparing home literacy experiences of children with and without disabilities

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>CA*</th>
<th>Disability</th>
<th>Survey Type</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Otaiba et al. (2009)</td>
<td>107</td>
<td>3-72</td>
<td>Down syndrome</td>
<td>22-item on-line – Likert scale, RO, CL</td>
<td></td>
</tr>
<tr>
<td>Breit-Smith, Cabell, &amp; Justice (2010)</td>
<td>343</td>
<td>36 – 72</td>
<td>.9% - LD; 74.1% SLI; 2% BD; 5.8% - HI; 7.6% VI; 5.2% - PI; 0.3% - AU; 4.1% - ADD</td>
<td>Survey featured on a website</td>
<td></td>
</tr>
<tr>
<td>Light &amp; Kelford-Smith (1993)</td>
<td>15</td>
<td>29 – 70</td>
<td>Physical disability and significant speech impairments</td>
<td>35 questions M/C, R/O, O/E</td>
<td></td>
</tr>
<tr>
<td>Marvin &amp; Mirenda (1993)</td>
<td>168</td>
<td>24 – 71</td>
<td>83.3% - SLI; 20.2% - PI; 13.1 - MH; 10.1% - HI; 9.5% - BD; 7.1% - VI; 3.6% - AU; 3.6 - OHI; 6.0% - other</td>
<td>39 questions, M/C and CL</td>
<td></td>
</tr>
<tr>
<td>Marvin &amp; Wright (1997)</td>
<td>119</td>
<td>36 - 71</td>
<td>50% - PI; 30% – VI; 20% – BD; 2% - OHI</td>
<td>39 questions, M/C and CL</td>
<td>57% - SWD 77%</td>
</tr>
<tr>
<td>van der Schuit, Segers, van Balkom, &amp; Verhoeven (2009)</td>
<td>48 – SWD</td>
<td>36 – 72</td>
<td>Intellectual disabilities</td>
<td>54 questions, M/C, O/E</td>
<td>64% - SWD 83%</td>
</tr>
<tr>
<td>Weikle &amp; Hadadian (2004)</td>
<td>200</td>
<td>36 - 71</td>
<td>53.5% - SLI; 14% - MH; 10% - PI; 8% - BD; 6% - HI; 1.5% - VI; 7% - other</td>
<td>Demographic info, 20 Likert scale questions, &amp; 1 OE</td>
<td>36%</td>
</tr>
</tbody>
</table>

Note. CA = chronological age; SWD = students with disabilities; TP = typical peers; SD = single disability; MD = multiple disabilities; OD = other disabilities; HS = Head Start; M/C = multiple choice; R/O = rank order; O/E = open ended; CL = checklist; SLI = speech-language impairment; PI = physical impairment; MH = mental handicap; HI = hearing impairment; BD = behavior disorder; VI = visual impairment; AU = autism; OHI = other health impaired; ADD = attention deficit disorder

* Age in months
<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Age (months)</th>
<th>CA*</th>
<th>M</th>
<th>F</th>
<th>Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binger et al. (2008)</td>
<td>3</td>
<td>35-49</td>
<td></td>
<td>1</td>
<td>2</td>
<td>Severe, congenital motor speech impairments (PDD, Digeorge Syndrome, and subpalatal cleft)</td>
</tr>
<tr>
<td>Crain-Thoreson &amp; Dale (1999)</td>
<td>32</td>
<td>39-66</td>
<td>22</td>
<td>10</td>
<td>Mild to moderate language delay</td>
<td></td>
</tr>
<tr>
<td>Crowe et al. (2004)</td>
<td>6</td>
<td>38-41</td>
<td>2</td>
<td>4</td>
<td>Language impairment</td>
<td></td>
</tr>
<tr>
<td>Dale et al. (1996)</td>
<td>33</td>
<td>36-72</td>
<td>24</td>
<td>9</td>
<td>Mild to moderate language delay</td>
<td></td>
</tr>
<tr>
<td>Davie &amp; Kemp (2002)</td>
<td>22</td>
<td>54-80</td>
<td>16</td>
<td>6</td>
<td>Intellectual disability and language impairment (Down syndrome, global delay, ASD, chromosomal disorder, tuberous sclerosis)</td>
<td></td>
</tr>
<tr>
<td>Hargrave &amp; Senechal (2000)</td>
<td>36</td>
<td>36-60</td>
<td>15</td>
<td>21</td>
<td>Poor expressive vocabulary skills</td>
<td></td>
</tr>
<tr>
<td>Hockenberger et al. (1999)</td>
<td>7</td>
<td>53-59</td>
<td>3</td>
<td>4</td>
<td>3 mild to moderate developmental disability plus low SES</td>
<td></td>
</tr>
<tr>
<td>Justice et al. (2003)</td>
<td>18</td>
<td>48-60</td>
<td>13</td>
<td>5</td>
<td>All low SES; 6-LI; 6-LI plus SI; 1- SI; 5 TD</td>
<td></td>
</tr>
<tr>
<td>Koppenhaver et al. (2001)</td>
<td>6</td>
<td>42-74</td>
<td>6</td>
<td></td>
<td>Rett syndrome with severe communication impairment</td>
<td></td>
</tr>
<tr>
<td>Light et al. (1994)</td>
<td>5</td>
<td>28-69</td>
<td>1</td>
<td>4</td>
<td>Severe physical and communication impairment</td>
<td></td>
</tr>
<tr>
<td>Lovelace &amp; Stewart (2007)</td>
<td>6</td>
<td>48-60</td>
<td>1</td>
<td>4</td>
<td>Mild language impairment</td>
<td></td>
</tr>
<tr>
<td>Saint-Laurent et al. (1998)</td>
<td>20</td>
<td>48-72</td>
<td>11</td>
<td>9</td>
<td>Intellectual disabilities</td>
<td></td>
</tr>
<tr>
<td>Trudeau et al. (2003)</td>
<td>4</td>
<td>46-70</td>
<td>3</td>
<td>1</td>
<td>2 –typically developing; 1 - Down syndrome; 1 - severe speech and physical impairment</td>
<td></td>
</tr>
<tr>
<td>van Bysterveldt (2006)</td>
<td>14</td>
<td>51-59</td>
<td>2</td>
<td>5</td>
<td>7 - Down syndrome; 7 – typically developing</td>
<td></td>
</tr>
</tbody>
</table>

*Note: N = number of participants; CA = chronological age; M = male; F = female; e = experimental group; c = control group
*Age in months
<table>
<thead>
<tr>
<th>Study</th>
<th>Implementers</th>
<th>Implementation setting</th>
<th>Amount of instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binger et al. (2009)</td>
<td>Caregivers</td>
<td>Home</td>
<td>Until caregivers used strategy with 90% accuracy.</td>
</tr>
<tr>
<td>Crain-Thoreson &amp; Dale (1999)</td>
<td>Caregivers, Staff (teacher, librarian, teacher’s aide, school nurse)</td>
<td>Exp. group - home and center-based special education program Control – center-based special education program</td>
<td>Two 1.5-hr sessions 4 wks apart for caregivers and staff</td>
</tr>
<tr>
<td>Crowe et al. (2004)</td>
<td>Mothers</td>
<td>Home</td>
<td>40 min - first instructional session, 30 min second to fourth sessions, 20 min sessions for the remaining six</td>
</tr>
<tr>
<td>Dale et al. (1996)</td>
<td>Caregivers</td>
<td>Home</td>
<td>Two instructional sessions 3 to 4 weeks apart</td>
</tr>
<tr>
<td>Davie &amp; Kemp (2002)</td>
<td>Two special education teachers one early childhood teacher</td>
<td>Special education center</td>
<td>None reported; used teacher experience</td>
</tr>
<tr>
<td>Hargrave &amp; Senechal (2000)</td>
<td>Caregivers and teachers</td>
<td>Day care centers</td>
<td>One 1-hr instructional session for caregivers and teachers</td>
</tr>
<tr>
<td>Hockenberger et al. (1999)</td>
<td>Mothers</td>
<td>Home</td>
<td>3 1-hour sessions during 1 week</td>
</tr>
<tr>
<td>Justice et al. (2003)</td>
<td>Reading specialist &amp; SLP</td>
<td>Preschool center</td>
<td>Graduate level instruction in intervention principle for working with children with language impairment</td>
</tr>
<tr>
<td>Koppenhaver et al. (2001)</td>
<td>Mothers</td>
<td>Homes</td>
<td>Two-hour instruction with caregivers</td>
</tr>
<tr>
<td>Light et al. (1994)</td>
<td>Caregivers</td>
<td>Homes</td>
<td>None</td>
</tr>
<tr>
<td>Lovelace &amp; Stewart (2007)</td>
<td>Researchers</td>
<td>Early Learning Center</td>
<td>None</td>
</tr>
<tr>
<td>Saint-Laurent et al. (1998)</td>
<td>Caregivers</td>
<td>Homes</td>
<td>One 3-hr instructional session plus weekly home visits</td>
</tr>
<tr>
<td>Trudeau et al. (2003)</td>
<td>Caregivers and researchers</td>
<td>Homes and clinic</td>
<td>Attended weekly 60 to 90 min group sessions and observed book reading</td>
</tr>
<tr>
<td>van Bysterveldt (2006)</td>
<td>Caregivers</td>
<td>Homes</td>
<td>One instructional session</td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Intervention strategies</td>
<td>Dependent variables</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Binger et al. (2009)</td>
<td>Single-subject multiple probe</td>
<td>Read, test, and model 2 symbol use with aided AAC system</td>
<td>Accuracy of caregivers’ implementation, Frequency of child multi-symbol utterance productions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask WH-questions and model answer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer WH-questions using aided AAC model</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wait 5s before providing model</td>
<td></td>
</tr>
<tr>
<td>Crain-Thoreson &amp; Dale</td>
<td>Group design</td>
<td>Modified Dialogic Reading - ask questions, - slow down*, - follow child response with</td>
<td>Adult story reading style, Child language, MLU, Different words, Participation, PPVT-R, EOWPVT-R</td>
</tr>
<tr>
<td>(1999)</td>
<td></td>
<td>question - repeat child, - help as needed, - praise, - follow child’s interest, - ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>open-ended questions, - expand child utterances</td>
<td></td>
</tr>
<tr>
<td>Crowe et al. (2004)</td>
<td>Single subject Multiple baseline</td>
<td>Complete Reading Cycle - establish joint focus, - ask questions, - child response</td>
<td>Communication turns, Story-related initiations, Number of different words, Total number of words</td>
</tr>
<tr>
<td></td>
<td>across subjects</td>
<td>- feedback on the child’s response</td>
<td></td>
</tr>
<tr>
<td>Dale et al. (1996)</td>
<td>Group design random assignment</td>
<td>Dialogic Reading Training during shared book reading</td>
<td>Child responses: Total number of utterances, Verbal engagement, MLU, Number of Different words</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conversational Language Training during facilitated play</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Intervention strategies</td>
<td>Dependent variables</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Davie &amp; Kemp (2002)</td>
<td>Group design</td>
<td>Adult-shared book reading and facilitate play</td>
<td>Number of intelligible utterances Number of single morphemes used Type of interaction (imitation, response, or initiation)</td>
</tr>
<tr>
<td>Hockenberger et al. (1999)</td>
<td>Multiple baseline across participants with an embedded withdrawal</td>
<td>Commenting during caregiver-child shared book reading</td>
<td>Number of assertive and responsive communication acts</td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Intervention strategies</td>
<td>Dependent variables</td>
</tr>
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<tr>
<td>Koppenhaver et al. (2001)</td>
<td>Multiple baseline across behaviors</td>
<td>Hand splinting AAC device Caregiver implemented strategies</td>
<td>Frequency of symbolic communication acts Frequency of child labeling and commenting</td>
</tr>
<tr>
<td>Light et al. (1994)</td>
<td>Multiple baseline alternating treatment</td>
<td>Use of familiar vs. unfamiliar books</td>
<td>Use of AAC device Rate of communication acts Caregiver communicative behaviors Children’s communicative behaviors</td>
</tr>
<tr>
<td>Lovelace &amp; Stewart (2007)</td>
<td>Multiple probe across participants</td>
<td>Non-evocative print-referencing</td>
<td>Concepts about Print Assessment</td>
</tr>
<tr>
<td>Saint-Laurent et al. (1998)</td>
<td>Group design</td>
<td>10-15 min daily interactive book reading with before, during and after reading strategies</td>
<td>Emergent Literacy Scale</td>
</tr>
<tr>
<td>Trudeau et al. (2003)</td>
<td>Multiple probe multiple baseline across subjects design</td>
<td>Use of adapted books, materials, and AAC; provide opportunities, prompt, model, scaffold, and generalize</td>
<td>Communication modes and functions</td>
</tr>
<tr>
<td>van Bysterveldt (2006)</td>
<td>Group design</td>
<td>Print referencing techniques</td>
<td>Letter name knowledge Letter sound knowledge Print concepts Initial phoneme identity</td>
</tr>
<tr>
<td>Study</td>
<td>IR reliability</td>
<td>Data reported</td>
<td>Results</td>
</tr>
<tr>
<td>------------------------------</td>
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<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Binger et al. (2009)</td>
<td>R= .85</td>
<td>% of steps correctly implemented # of multi-symbols messages</td>
<td>All caregivers used strategies at 80% or higher</td>
</tr>
<tr>
<td></td>
<td>R=0.97 child</td>
<td>measures</td>
<td>All children increased # of multi-symbol messages used</td>
</tr>
<tr>
<td></td>
<td>measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crain-Thoreson &amp; Dale (1999)</td>
<td>79%</td>
<td>Pre-and post test frequency of adult behaviors during SBR; measures of child</td>
<td>Caregivers and staff changed their reading style. Children used more</td>
</tr>
<tr>
<td></td>
<td>language</td>
<td>language</td>
<td>language and elaborated more</td>
</tr>
<tr>
<td>Crowe et al. (2004)</td>
<td>94%</td>
<td># of communicative turns, # of story initiations, # of different words used,</td>
<td>All children increase # of communicative turns, # of words, and # of</td>
</tr>
<tr>
<td></td>
<td>and # of words</td>
<td></td>
<td>different words; 83% increase # of initiations</td>
</tr>
<tr>
<td>Dale et al. (1996)</td>
<td>NR</td>
<td># of caregiver strategy use, # of child language and behavior, and differences</td>
<td>Sign.diff between programs DRTP having greater effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>between pre-and post-test using ANCOVA</td>
<td></td>
</tr>
<tr>
<td>Davie &amp; Kemp (2002)</td>
<td>87% - CI 95.5%</td>
<td>Mean differences for utterances, intelligibility, and complexity</td>
<td>Greater # of utterances and intelligibility with book reading</td>
</tr>
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Table 2-5. Continued

<table>
<thead>
<tr>
<th>Study</th>
<th>IR reliability</th>
<th>Data reported</th>
<th>Results</th>
<th>Tx F</th>
<th>Gen.</th>
<th>Main</th>
<th>SV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hargrave &amp; Senechal (2000)</td>
<td>NR</td>
<td># of different adult reading behaviors used; Child vocabulary measures</td>
<td>Greater # of wh-questions, praise and repetition of child utterances with DR</td>
<td>Log books</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Hockenberger et al. (1999)</td>
<td></td>
<td>Children with DD - 95%, 98%, 94%; Children at-risk – 94%, 95%, 94%, 88%</td>
<td># of caregiver comments and # of child utterances Concepts about Print Test (CLAY, 1979)</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Justice et al. (2003)</td>
<td>R=0.69</td>
<td>Mean scores on EL measures for exp and control groups</td>
<td>All children showed growth in EL growth. Growth was greater for exp. group</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Koppenhaver et al. (2001)</td>
<td>R=0.91</td>
<td># of successful symbolic communication for familiar and unfamiliar books</td>
<td>Increase for all participants in # of symbolic communication, labels and comments used.</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Light et al. (1994)</td>
<td>R=-0.96 for children's behaviors; R=0.90 for mothers' behaviors R=0.97</td>
<td># of communicative acts by mother's and children's while reading familiar and unfamiliar books</td>
<td>Mothers dominated interactions and provided few opportunities for child participation in either condition</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Lovelace &amp; Stewart (2007)</td>
<td></td>
<td>% of correct responses to probes</td>
<td>All children learned print concepts</td>
<td>96%</td>
<td>Y</td>
<td>N</td>
<td>N</td>
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</table>
Table 2-5. Continued

<table>
<thead>
<tr>
<th>Study</th>
<th>IR reliability</th>
<th>Data reported</th>
<th>Results</th>
<th>Tx</th>
<th>F</th>
<th>Gen.</th>
<th>Main</th>
<th>SV</th>
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<tbody>
<tr>
<td>Saint-Laurent et al.</td>
<td>NA</td>
<td>Pre- and post mean test scores compared for the Emergent Literacy Scale and Print Awareness Instrument</td>
<td>Sign diff in pretending reading between groups</td>
<td>78%</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>(1998)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Trudeau et al.</td>
<td>R=0.92 and 0.94 for mothers' modes and intents</td>
<td># of different communicative modes and intents used by child participants</td>
<td>All children increased participation in book reading. Children with disabilities used the adaptations more and relied on adults for opportunities to participate.</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>(2003)</td>
<td></td>
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</tr>
<tr>
<td>van Bysterveldt</td>
<td>NA</td>
<td>Pre-and post mean scores on letter name knowledge, letter sound knowledge, print concepts, and initial phoneme identity</td>
<td>Sign treatment effects for letter sound knowledge, initial phoneme identity, and print concepts</td>
<td>86%</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>(2006)</td>
<td></td>
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Note. NA = not applicable; NR = not reported; Y = yes; N = no; exp. = experimental group; c = control group;
CHAPTER 3
METHOD

The purpose of this chapter is to describe the methods and procedures used to conduct the study. Specifically, this chapter details the following: (a) the criteria for participation and process for selecting participants; (b) a description of the participants based on descriptive data collected from the interviews, questionnaires, and assessments; (c) the settings for conducting the study and the materials used; (d) the research design; (e) the independent variables; (f) the dependent variables and observational coding definitions; (g) the research procedures; and (h) the data collection and analysis procedures (i.e., coding, graphing, analyzing intervention data; interobserver agreement; fidelity of caregiver instruction; procedural fidelity; and social validity).

Criteria for Participation and Process for Selecting Participants

The purpose of the present study was to determine: (a) if instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions at home. The participants for the present study were the primary caregivers who were the legal guardians of, and provided the majority of daily care for, a child 18 to 34 months with significant developmental delays. The caregivers for the present study were identified after first identifying children who were eligible to participate in the study. The child participants were 18 to 34 months of age and recruited from the North Central
Florida Early Steps program at the University of Florida (UF). Early Steps is operated by the Florida Department of Health’s Children’s Medical Services in accordance with IDEIA (2004) statute (P. L. 108-446) for Part C services. This program provides early intervention services to eligible children age birth to 36 months and their families. The Early Steps program at UF serves 10 counties in north central Florida. Once eligible child participants were identified, the caregivers were identified. The criteria for participation and the process for selecting participants are discussed in the following sections.

Criteria for Participation

Adult participants for the study were the primary caregivers who were the legal guardians of, and provided the majority of daily care for, children ages 18 to 34 months with significant developmental delays. For example, a primary caregiver could have been, but was not limited to, a child’s biological parent, grandparent, stepparent, relative, or adoptive parent. An adult participant hereafter will be referred to as a caregiver. Caregivers were eligible to participate in the study with their children based on meeting three criteria. First, the caregiver was at least 18 years old and the legal guardian for a child age 18 to 34 months with significant developmental delays. This criterion was necessary for the caregiver to sign the informed consent documents for their participation in the study, as well as for their child’s participation. Second, the caregiver provided the majority of care for their participating child. This criterion was necessary because the caregiver was required to respond to interview questions about the child and interact with the child regularly for the study. Third, the caregiver could speak and read English as their primary language because the materials (i.e., consent forms, questionnaires, books) and interactions (e.g., caregiver instruction) with the
researcher for the study were in English. Potential caregivers were identified by first identifying children age 18-34 months with significant developmental delays who met criteria for participation in the study.

Children were eligible caregiver was selected to participate in the study based on meeting two criteria. The first criterion for participation was that the child was eligible for the Early Steps program. A child could be eligible for the Early Steps program in two ways. First, according to the Florida Department of Health Children’s Medical Services, eligible children could demonstrate a developmental delay that “meets or exceeds 1.5 standard deviations below the mean in two or more developmental domains or 2.0 standard deviations below the mean in one or more developmental domains (i.e., cognitive, physical, communication, social/emotional, or adaptive), as measured by appropriate diagnostic instruments and procedures” (2010). Second, the Florida Department of Health Children’s Medical Services (2010) stipulates that to be eligible for the Early Steps program a child could have an established condition identified by one of six diagnoses: (a) genetic and metabolic disorder, (b) neurological disorder, (c) severe attachment disorder, (d) autism spectrum disorder, (e) significant sensory impairment, or (f) other condition such as hydrocephalus or low birth weight.

The second criterion for a child’s participation in the study was that, in addition to being eligible for the Early Steps program, the child was identified as having a significant developmental delay. For the present study, a significant developmental delay was defined as a delay of at least 50% below the child’s chronological age, or a scaled score of 4 or below in communication and at least one other developmental domain or subdomain (i.e., adaptive, personal-social, motor, or cognitive) as measured
on a developmental scale. The subdomains were included because not all domain scores were available for each child. The Early Steps clinical coordinator determined the existence of a significant developmental delay using evaluations administered by Early Steps personnel. For the present study, the caregivers and their children will hereafter be referred to as caregiver-child dyads.

**Process for Recruiting Participants**

In compliance with the policies delineated by the UF Institutional Review Board (IRB) and following IRB approval, the researcher met with the two co-directors of the Early Steps program at UF and three members of their staff (i.e., two clinical coordinators and one administrative coordinator) to share details about the study, participant selection criteria, and contact information for the researcher. One of the clinical coordinators then compared demographic and developmental assessment data contained in their database for children currently participating in Early Steps with the criteria for the present study and determined which of the children listed in their database met the criteria for the study. Twenty potential child participants were determined eligible from a pool of 200 residing in the same county as the Early Steps facility. A human resources program specialist working with Early Steps and under the direction of the clinical coordinator contacted via telephone the caregiver of each of the 20 eligible child participants identified. She read the cover letter explaining the purpose of the study to each caregiver and asked if they would like to receive additional information about the study. Packets about the study were mailed to 18 of the 20 caregivers contacted, who requested additional information. The packet contained: (a) a cover letter that explained the purpose of the study and listed the researchers’ contact information, (b) informed consent documents (i.e., caregiver consent form and child
assent form), and (c) a stamped researcher-addressed envelope (see Appendix A for informed consent documents addressing the participation of the caregiver-child dyads).

One week after sending the packets, the human resources program specialist telephoned each of the 18 caregivers, who expressed interest in the study, to determine if they had received the packet. If the caregivers stated that they had received a packet, the human resources program specialist documented it. If they had not received a packet, then an additional packet was sent. After 3 weeks, the administrative coordinator telephoned each of the 18 caregivers to whom a packet had been sent but who had not contacted the researcher to answer any questions about the study. This process (i.e., sending information packets and telephoning the caregivers conducted by the Early Steps personnel) resulted in three caregivers contacting the researcher -- two by telephone and one by email.

Next, the clinical coordinator compared demographic and developmental assessment data contained in the Early Steps database to identify eligible children currently participating in Early Steps in an adjacent county. This yielded 30 eligible child participants from a pool of 280 children participating in the Early Steps program from that county. Again, the human resources program specialist working with Early Steps contacted via telephone the caregiver of each of the 30 eligible child participants identified. She again read the cover letter of the packet that explained the purpose of the study to the caregiver and asked if they would like to receive additional information about the study. Sixteen caregivers requested additional information. One week after sending the packets, the human resources program specialist telephoned each of the 16 caregivers who expressed interest in the study to determine if they had received the
packet. If the caregivers stated that they had received a packet, the human resources program specialist documented it. If they had not received a packet, then an additional packet was sent. After 3 weeks a family resources specialist telephoned each caregiver to whom a packet had been sent but who had not contacted the researcher to answer any questions about the study. This process (i.e., sending information packets and telephoning the caregivers conducted by the early steps personnel) resulted in two caregivers telephoning the researcher.

The researcher further explained the study to each of the five caregivers by telephone then met with each of the five caregiver-child dyads in their homes. During this visit, the researcher obtained written informed consent. While five caregiver-child dyads began the study, only three dyads were able to complete the study. One of the two dyads that were not able to complete the study had a family medical issue and withdrew before they began the intervention phase. Although the caregiver had received instruction on the caregiver—implemented shared book reading intervention, their withdrawal presented a threat to the internal validity of the study and so the baseline data for this dyad was not included. The other dyad left town for an extended period just after the intervention phase began. While the caregiver continued to collect data, the change in location and environment were considered threats to the internal validity of the study and, therefore, required an administrative removal from the study. The three caregiver-child dyads that completed the study are described below.

**Description of Participants**

After the caregivers signed the informed consent documents to participate in the study with their children, and prior to video recording the shared book reading sessions, the researcher collected descriptive data. The descriptive data were used to
characterize each dyad’s home literacy activities, the social status of each caregiver, and the development and history of each child. As described below, the tools used to collect these descriptive data were: one guided interview, two questionnaires, and two assessments.

**Interview Data**

The researcher conducted an interview with each caregiver using guided questions related to his/her child’s communication, previous and current intervention services, and medical history (see Appendix D for interview questions). This information was used to describe the child’s development and history (e.g., medical conditions, therapy services, educational services, and participation in other intervention studies), and to assist with the interpretation of study findings.

**Questionnaire Data**

The caregivers completed two questionnaires. First, caregivers completed an adapted version of the Stony Brook Family Reading Survey (SBFRS; Whitehurst, 1993; see Appendix B for the SBFRS). This survey characterized the dyad’s home literacy activities and provided information about the child’s exposure to literacy and literacy experiences. The 55-item questionnaire contained 42 Likert-type items and 13 questions related to demographic information. These items and questions addressed the home literacy environment, the caregiver’s expectations, and the caregiver’s attitudes about responsibility for their child’s early literacy development. Other researchers have used the questionnaire to describe the home literacy environments for children from families of low socioeconomic status who were attending Head Start Programs. Internal consistency score reliability has not been determined for the SBFRS because the developers did not intend for all 55-items on the survey to be used together.
(Touliatos, Perlmutter, & Straus, 2001). However, Storch and Whitehurst (2001), using the SBFRS, demonstrated that the home literacy environment along with caregiver characteristics and expectations for literacy accounted for 40% of the variance in preschool children’s scores on language and emergent literacy measures.

Because the population of interest for the present study was different from the population for whom the questionnaire was developed originally, the questionnaire was adapted in several ways. First, the initial three items in the original questionnaire related to a child’s speech and language development. For the present study, these questions were deleted from the questionnaire because the content was addressed in the guided interview with the caregiver. Second, previous respondents to the SBFRS (Whitehurst, 1993) questionnaire primarily have been caregivers of children in Head Start programs. Three questions on the original questionnaire refer to the “Head Start child.” These questions were altered to refer to the “child,” rather than the “Head Start child.” Third, one question addressed the child’s behavior in the Head Start program. This question was deleted because each child in the study did not participate in Head Start programs and the content was not relevant to the child’s participation in the Early Steps program. Fourth, three questions addressed the child’s expected performance in elementary school. These questions were deleted because they were not relevant to the study and because the child participants were below 3 years old and would not enter elementary school for at least 2 years. Fifth, one question addressed the school performance of the child’s siblings. This question was deleted because it was not relevant to the present study. Sixth, one question addressed the education level of the participating caregiver. Caregiver education level was addressed in another questionnaire used in the present
study; therefore, this question was deleted to eliminate redundancy. Finally, 14
questions in the original questionnaire were deleted because they focused on the
caregiver’s attitudes about responsibility for their child’s academic development.
Because the questions were based on the context of school and the children in the
study were not in elementary school, these questions were not relevant and deleted
from the questionnaire. This process resulted in three questions that were altered and
29 questions that were used in their original form for the present study. The final survey,
therefore, contained 32 questions.

Fletcher and Sabo (2006) focused on four questions from the SBFRS (Whitehurst,
1993) that reflected the frequency and duration of shared book reading in the home and
the child’s interest in books. They used the scores to define high and low levels of home
literacy activity. These same four questions related to home literacy were examined in
the present study because they provided information about the reported frequency and
duration of shared book reading in the home and the child’s interest in books. These
questions were: (a) how often do you or another family member read a picture book with
your child? (b) If your child is read to, how much does your child enjoy it? (c) How often
does your child look at books by himself or herself?, and (d) how many minutes per day
do you spend reading not counting the time you spend reading with your child?
(Fletcher & Sabo, 2006). The total score for the four questions was calculated by adding
the numeric values of the responses for each of the four questions with a possible range
of 0 to 13. Scores of 11 to 13 are considered high levels of home literacy activity and
scores less than 10 are considered low levels of home literacy activity (Fletcher & Sabo,
2006). See Table 3-1 for dyad home literacy activity levels. The remaining 28 questions
provided information about the availability of reading materials, the caregiver’s
enjoyment and frequency of reading, and the caregiver’s primary language and
ethnicity, which helped to describe the dyads.

The second questionnaire was based on the Hollingshead Four-Factor Index
(1975) and was used to describe the caregiver’s social status. The four factors
addressed in the Index were: sex, marital status, education level, and current
occupation. According to Hollingshead (1975), differentiated values are associated with
an individual’s education level and that education level is linked to their occupation and
the individual is compensated monetarily and socially for their effort based on their
occupation. The factor of sex is important in determining social status because it might
be related to the role an individual has in society (Hollingshead, 1975). Marital status is
associated with social status because adult family members might participate differently
in the economic system based on their marital status (Hollingshead, 1975). For
example, in the situation of a married couple with children, one spouse might stay home
to take care of the children while the other spouse works. The Index would be based on
the education and occupation of the working spouse. However, if the couple was
divorced and living separately, then both spouses might work outside the home and the
Index would be based on the education and occupation of one of the individuals, which
might result in a different social status. To validate the Index, Hollingshead (1975)
compared the scores obtained for the Index with prestige scores used by the National
Opinion Research Center, which are based on age, wealth, and education. The
correlation coefficient for this comparison was \( r = 0.927 \), indicating a positive relationship
between the Index scores and the prestige scores (Crocker & Algina, 1986).
For the present study, the researcher created the second questionnaire to elicit responses from each caregiver regarding the four factors (i.e., sex, marital status, education level, and current occupation). After a caregiver completed the second questionnaire independently, the researcher calculated the Index based on the responses. The factors of occupation and education were scored on a scale of 1 to 9 and 1 to 7, respectively, using tables contained in the Hollingshead (1975) manuscript. The occupation factor scale score then was multiplied by a weight factor of 5, and the score for education was multiplied by a weight factor of 3. These two products were summed for a total score, from which the social status was estimated. For example, if a caregiver were a homemaker married to a spouse who had a college diploma and was employed as an editor, then the estimated social status would be based on the education and occupation of the employed spouse. According to the Hollingshead Four-Factor Index (1975), the education score would be 6, and the occupation score 8. These scores would be multiplied by their respective weight factors of 3 and 5, and then summed, resulting in a total score of 58 [i.e., (6 x 3) + (8 x 5) = 58]. Using the tables contained in the Hollingshead (1975) manuscript, a score of 58 is equivalent to the social status of a professional employed by a major business. If a caregiver is married and living with a spouse, and both are employed, then two scores based on the education level and occupation of each spouse are calculated, summed, and divided by 2 (see Appendix C for a list of questions used to determine the Index). See Table 3-1 for the social status identified for each caregiver.

**Assessment Data**

The researcher conducted an adapted form of the Unstructured Joint Attention Assessment (Loveland & Landry, 1986) with each child participant. The assessment
was completed to determine each child’s ability to respond to protodeclarative bids (i.e., pointing to an item for the purpose of showing the item and gaining the child’s attention to that item) for joint attention.

Because the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) incorporated the use of protodeclarative bids to shift each child’s attention to an item (e.g., picture in the book), it was necessary to determine the degree to which each child participant understood this pre-symbolic form of communication. While this information was not used as criteria for participation, it was used to interpret each child’s responsiveness to the intervention. The full assessment contains four types of tasks to assess joint attention either from the caregiver or from the child, and is designed to test the child’s ability to both produce and understand pronouns, and to both produce and respond to attention-directing communication (Loveland & Landry, 1986). The four types of tasks are: the child’s use of pronouns and protodeclarative bids, and the child’s response to the caregiver use of gesture-only and gesture-plus-language (Loveland & Landry, 1986). For the present study, the assessment was adapted to address two of the four types of tasks to assess joint attention. Responses to bids for attention using gestures-only and gestures-plus-language tasks were assessed because the intervention used in the study addressed the caregiver’s use of protodeclarative bids for joint attention and their child’s responses to those bids, rather than the child’s use of protodeclarative bids or pronouns. During the approximately 30 min assessment completed in an unstructured setting in the child’s home, the researcher used gestures only, and gestures plus language, to shift each child’s attention to objects. The
caregiver of each child was permitted to stay in the room, but was asked not to engage with the child during the assessment. Ten different bids were presented; five bids used gestures only and five bids used gestures plus language (see Appendix E for the Unstructured Joint Attention Assessment protocol). For example, for the gesture-only bids, the researcher established eye contact with the child, then shifted eye gaze to an object that was near to the child but was out of the child’s reach; then looked back at the child. If the child shifted eye gaze to the intended object, then the bid was considered successful. If the child did not shift eye gaze, then the bid was considered unsuccessful. Each bid was presented up to 3 times during the assessment for a total of up to 15 gesture-only bids, to provide the child ample opportunities to respond (Rocha et al., 2007). If the child responded successfully the first time the bid was presented, it was not presented again.

For the gesture-plus-language bids, the researcher paired the gesture with language. For example, the researcher established eye contact, then shifted eye gaze to an object and said, “Look,” then looked back at the child. If the child shifted eye gaze to the intended object, then the bid was considered successful. Again, each gesture-plus-language bid was presented up to 3 times during the assessment. If the child did not shift eye gaze, then the bid was considered unsuccessful. If the child responded successfully the first time the bid was presented, it was not presented again. While the researcher collected data on each child’s performance during the assessment session, each assessment session was video recorded and later scored by a second observer to determine interobserver agreement (Whalen & Scheibman, 2003). In one study where this assessment tool was utilized, the researchers obtained interobserver score
agreement for the assessment using the identified two task types at $k=0.92$ for child responding and $k=0.93$ for parent initiations (Rocha et al., 2007). See Table 3-1 for each child participant’s number of successful bids scored.

In addition, the researcher and each caregiver together completed the ABILITIES Index (Simeonsson & Bailey, 1991) for their child. This Index addresses 9 functional ability domains: audition (hearing), behavior and social skills, intellectual functioning (thinking and reasoning), limbs (use of hands, arms, and legs), intentional communication (understanding and communicating with others), tonicity (muscle tone), integrity of physical health (overall health), eyes (vision), and structural status (shape, body form and structure). This assessment yielded a profile of “individual characteristics of infants and young children with disabilities” (Simeonsson, Bailey, Smith, & Buysse, 1995, p. 271). A study of interrater score reliability across caregivers, teachers, and clinicians using the ABILITIES Index revealed agreement of 67.2% for an exact rating of each domain, and 86.2% for ratings within one point for each domain (Bailey, Simeonsson, Buysse, & Smith, 1993). Ratings from 1, indicating normal functioning, to 6, indicating profound disability, for this Index provided a profile of the child’s functional abilities across the 9 domains. See Figures 3-1 through 3-3 for each child participant’s ratings in all domains.

**Participants**

The participants for the study were three caregivers and their young children diagnosed with significant developmental delays. The sections below describe each caregiver-child dyad based on information collected from the descriptive data.
Hunter and his caregiver

Hunter, a Caucasian male, was 22 months old when enrolled in the study. During the study, Hunter received speech therapy in his home 1 time per week for 1 hr provided by Early Steps. He was eligible to participate in the study based on the Battelle Developmental Inventory-2nd edition (BDI-2; Newborg, 2005). His subdomain scaled score for self-care was 3; his scaled score for receptive communication was 1 and his scaled score expressive communication was 2, indicating a significant developmental delay.

Based on the interview with Hunter’s mother, Hunter was delivered via cesarean section at 37 weeks gestation, weighing 9 pounds. He is the younger of two children in the home. His brother is 5 years old. Hunter’s pediatrician referred him to Early Steps because of concerns for his speech development. According to the caregiver interview, Hunter’s expressive vocabulary included the words “mama,” “dada,” and “more.” In addition, he communicated with his mom by grunting, pointing, or pulling her toward a desired object. His mother reported that she uses sign language of the words “more,” “ball,” and “up” to communicate with Hunter. Communication was reported as his caregiver’s primary concern for Hunter’s development.

Responses on the Stony Brook Family Reading Survey (SBFRS; Whitehurst, 1993) revealed that English was the primary language spoken in the home. Hunter’s mother indicated that she or another family member reads with him almost daily. Hunter enjoys reading and they have between 3 and 10 picture books in the home. His mother reported spending between 31 to 60 min per day reading herself. Responses to questionnaires also resulted in a Hollingshead Four-Factor Index (Hollingshead, 1975)
of 45, indicating a social status equivalent to that of a minor professional or technical worker at a medium business.

For the Unstructured Joint Attention Assessment (Loveland & Landry, 1986), Hunter responded to five of the five gesture-plus-language bids. Each gesture-plus-language bid required one bid for a successful response. For the gesture-only bids, Hunter responded successfully to four of the five gesture-only bids. He required an average of 1.8 attempts per gesture-only bid. He did not respond to the bid of requesting gaze shift without language.

On the ABILITIES Index (Simeonsson & Bailey, 1991), Hunter received a rating of 1 (i.e., normal) on 8 of the 9 domains. The one domain on which he did not receive a rating of 1 was intentional communication. For the two subdomains comprising this domain (i.e., understanding others and communicating with others), Hunter received a rating of 4 (i.e., moderate disability). See Figure 3-1 for Hunter’s functional abilities profile.

**Charlie and his caregiver**

Charlie, a Caucasian male, was 29 months old when enrolled in the study. Charlie recently had been diagnosed with developmental delays in personal-social skills and communication on the BDI-2 (Newborg, 2005). His subdomain scaled score for adult interaction was 3, his scaled score for receptive communication was 1, and his scaled score expressive communication was 3, indicating significant delays. During the study, Charlie attended a child development laboratory center located on a college campus. The center utilized mixed-age grouping and served children both with and without developmental delays who were 14 months to 5 years old.
Charlie is the youngest of three children living in the home. For Charlie, the caregiver interview was conducted with his father, who reported that Charlie’s communication skills included gestures, physical contact, babbling, and sign language. Charlie often pointed and dragged his caregiver to a location in the home to express his wants and needs. His father reported that Charlie verbalized the words “yes,” “no,” “more,” “go,” “cheese,” and “here.” To meet Charlie’s needs, his father reportedly adapts his communication by first getting Charlie’s attention, then using a gesture or sign with verbalization. Charlie can identify numbers 1 through 10 and all of the alphabet letters. His father reported that his primary concern for his son’s development was communication.

According to the SBFRS (Whitehurst, 1993), Charlie’s home literacy activity was high, with a total score of 13 out of 13 on the four questions examined. In addition, while English was the primary language spoken in the home, Charlie’s mother was from Ecuador and her native language was Spanish, although she spoke English fluently. The information gathered on questionnaires resulted in a Hollingshead Index Four-Factor Index (Hollingshead, 1975) of 66, indicating a social status equivalent to that of a professional working in a major business, for example.

Charlie responded successfully to each of the 10 bids for attention on the Unstructured Joint Attention Assessment (Loveland & Landry, 1986), with an average of one prompt per bid. On the ABILITIES Index (Simeonsson & Bailey, 1991), Charlie received a rating of 1 (i.e., normal) for 8 of the 9 domains. The one domain on which he did not receive a rating of 1 was intentional communication. For the two subdomains comprising this domain (i.e., understanding of others and communicating with others),
he received a rating of 2 (i.e., suspected disability) for understanding of others and for communicating with others the rating was 4 (i.e., moderate disability). See Figure 3-2 for Charlie’s functional abilities profile.

**Heather and her caregiver**

Heather, a Caucasian female, was 34 months old at the time she was enrolled in the study. On the BDI-2 (Newborg, 2005), significant developmental delay was evident in Heather’s receptive communication scaled score at 4, and her expressive communication scaled score at 1. In addition, her scaled scores on both the gross motor and fine motor subdomains were 1 and her scaled score on the perceptual motor subdomain was 2. During the study, Heather received physical therapy services through Early Steps 1 time per week in the home. In addition, she attended a local hospital-based therapy center for speech and occupational therapy 3 times each per week, and for physical therapy 2 times per week.

Heather is the younger of two children living in the home. She has an older sister who was 13 years old at the time of the study. Her mother reported that Heather was born via emergency cesarean section following a full-term pregnancy. Heather reportedly remained in the neonatal intensive care unit for 3 days following her birth, and subsequently diagnosed with spastic cerebral palsy and an arachnoid cyst. Heather’s mother reported that Heather communicates by crying, using her eyes to track objects or people, pointing with her index finger, and reaching for objects or people. In addition, Heather reportedly babbles and laughs appropriately. Her mother reported that she adapted her own communication with Heather by presenting two to four objects from which Heather can make a selection. She stated that her primary concerns for her daughter’s development are sitting up and talking.
According to the SBFRS (Whitehurst, 1993), Heather’s home literacy activity was high, with a total score of 12 out of 13 on the four questions examined. The Hollingshead Index was a 32, indicating the family social status similar to that of skilled craftsmen, clerical, and sales workers.

On the Unstructured Joint Attention Assessment (Loveland & Landry, 1986), Heather responded to 8 of the 10 bids presented and required an average of 1.4 attempts per bid. The two bids to which she did not shift gaze were the gesture only shift gaze bid and the moving child’s hand bid with gesture only. On the ABILITIES Index (Simeonsson & Bailey, 1991), for 6 of the 9 domains, Heather received a rating of 1 (i.e., normal). The three domains for which she did not receive a rating of 1 were: her use of limbs for which she received a rating of 4 (i.e., moderate disability) for the upper extremities and 5 (i.e., severe disability) for the lower extremities, and communicating with others for which she received a rating of 5 (i.e., severe disability). For the domain of tonicity, Heather’s degree of tightness was rated 3 (mild disability) and her degree of looseness was rated 4 (moderate disability). See Figure 3-3 for Heather’s functional abilities profile.

**Settings and Materials**

This section describes the settings and materials selected for the study. While materials were the same across each phase of the study, the setting within the home for shared book reading sessions occurred changed for some dyads between the baseline and intervention phases.

**Settings**

The home is one naturally occurring setting in which caregiver-child dyads might participate in shared book reading sessions, and it was the setting selected for the
present study. Each caregiver initially selected one location in their home setting (e.g., living room, bedroom) where shared book reading sessions were video recorded during the baseline phase. After receiving instruction by the researcher on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), caregivers had an opportunity to select a different location in their home that was free from the distractions of other family members and household media (i.e., radio, television, and computer) that would be used for their shared book reading sessions for the remainder of the study. In addition, at this time each caregiver had an opportunity to change his/her sitting position relative to his/her child.

Materials

Three types of materials were used in the present study. First, children’s books were used during shared book reading sessions across phases of the study (i.e., baseline, intervention, and maintenance) and across caregiver-child dyads. Each caregiver chose 10 books from a set of 13 books selected for the study. The researcher selected the books based on the following 10 criteria recommended in the literature. Each book: (a) contained vocabulary words and concepts familiar to and appropriate for children 18 to 34 months of age (e.g., bath time and familiar objects, such as a ball or spoon); (b) set the context for interactions during shared book reading sessions using repeated words or phrases, songs, or themes; or through manipulative features (e.g., flaps), but excluding books focused on identification of alphabet letters and numbers; (c) contained simple pictures or photographs that were not complicated by backgrounds which competed with the salient feature; (d) contained pictures or photographs closely representing the object of interest; (e) contained text that closely related to the picture or
photograph on the page and that was limited in the number of words or phrases on each page; and (f) had a sturdy construction to support independent exploration (Fletcher & Sabo, 2006; Fletcher & Reese, 2005; Schickedanz, 1999; Zeece & Churchill, 2001). See Appendix H for the book selection criteria and Appendix I for the list of books selected. From this set of 13 books, the caregiver selected 10 books that were unfamiliar to the dyad. These 10 books were provided to the caregivers to use during the video recorded shared book reading sessions for the duration of the study, and to keep after the study was completed.

The process of selecting books based on the criteria discussed above served to control for differences in the contents of the dyads’ home libraries and for variations in the potential frequency and type of communicative behaviors that might occur during shared book reading with other books (e.g., familiar books; other unfamiliar books) (Light et al., 1994). Only books unfamiliar to each caregiver-child dyad, recommended based on the selection criteria and provided by the researcher, were used during the video recorded shared book reading sessions. The dyads were informed that they could use the books provided for the study during additional shared book reading sessions; that is, for shared book reading sessions that were beyond those video-recorded for the study. To document the frequency with which each dyad engaged in shared book reading weekly, caregivers were asked to document the date on which each video recorded shared book reading session occurred, the book read during each session, and the amount of time spent in the sessions. In addition, the caregivers were asked to document their impressions about both the video recorded shared book reading sessions and any additional shared book reading session that occurred between the
dyad, but were not video recorded for the study (see Appendix J for the book reading data collection sheet).

Second, the researcher provided a digital video recorder, 16-gigabyte memory card, and tripods for each participating caregiver to video record their shared book reading sessions with their child. The researcher also provided a video recording protocol to assist the caregivers in video recording the shared book reading sessions (see the Appendix K for the video recording protocol).

Third, the researcher used a computer with a Windows® operating system and ProcoderDV™ software (Tapp, 2002) to observe and code the video recorded sessions. ProcoderDV™ (Tapp, 2002) is a software program developed at the John F. Kennedy Center at Vanderbilt University and designed for collecting and coding observational data from digital media files.

**Research Design**

In this section the research design across caregiver-child dyads used in the present study is described. A multiple probe, multiple baseline design across participants (Horner & Baer, 1978) was used to determine: (a) if instruction in caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions at home. A multiple baseline design allows the intervention to be introduced to different participants at different times (Kazdin, 1982). Through this design, experimental control can be demonstrated within and across caregiver-child dyads.
(Kennedy, 2005). Multiple probes were used for caregiver-child dyads that remained in baseline phase while other dyads were either in a “true” baseline phase or the intervention phase. Conducting probe sessions intermittently, rather than continuously for the dyads that remained in baseline, was more practical because it permitted the dyads to video record their shared book reading sessions 1 time each week during the baseline phase, rather than 3 times per week for an extended period of time (Horner & Baer, 1978; Tawney & Gast, 1984). The literature refers to this series of continuous baseline sessions as a “true” baseline. For dyads in the true baseline phase a series of at least three continuous baseline sessions was conducted immediately before instruction in the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was provided to each caregiver. These data points were evaluated with respect to variability, level, and trend (Horner & Baer, 1978; Tawney & Gast, 1984) to evaluate the baseline levels of the caregivers’ use of the initial and follow-up prompting strategies prior to instruction on the intervention (Mancil et al., 2009). For the present study, data were collected on each caregiver’s use of the initial and follow-up prompting strategies, and each child’s use of communicative forms and communicative functions, during the video recorded shared book reading sessions. These data were collected to determine: (a) if instruction in caregiver-implemented shared book reading interventions (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting
strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions at home.

**Independent Variable**

The independent variable for the present study was instruction the caregivers received on the shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies). The caregiver instruction consisted of an initial instructional session and weekly reviews of the shared book reading intervention. The following sections describe this independent variable.

**Caregiver Instruction**

The researcher instructed each caregiver on the procedure for setting the environment, initial prompting strategies (i.e., label-and-wait, tap-and-wait, request-and-wait), and follow-up prompting strategies (i.e., helping, modeling) for use with their child. Setting the environment procedures and the initial and follow-up prompting strategies were taught only to the caregiver who would consistently participate in the caregiver-child dyad during shared book reading.

A 1-hour caregiver instructional session was conducted in the home of each caregiver-child dyad and consisted of four steps (Rocha et al., 2007; Woods, Kashinath, & Goldstein, 2004). First, the researcher discussed the benefits of shared book reading and the importance of communication for the child. Second, the researcher defined for the caregiver the setting the environment procedure and each of the initial and follow-up prompting strategies (see Appendix F) and provided a handout explaining each the intervention (see Appendix G for the handout explaining each strategy). During the instructional session, the caregiver had an opportunity to ask questions about the setting the environment procedure and the initial and follow-up prompting strategies.
The caregiver also had opportunities to make comments to verify their understanding of the setting the environment procedure and the prompting strategies. Third, the researcher modeled with the caregiver the setting the environment procedure and the use of each prompting strategy during shared book reading. Fourth, the caregiver demonstrated for the researcher the use of each of the five prompting strategies during a simulated shared book reading session and the researcher provided corrective feedback as needed throughout the session. This simulated shared book reading session continued until the caregiver independently implemented the three initial prompting strategies and two follow-up prompting strategies three times each with 100% accuracy during a 15 min role-play session (Woods et al., 2004). For the use of the strategies that contain waiting (i.e., label-and-wait, tap-and-wait, and request-and-wait), both components of the strategy (i.e., the action of label, tap, or request and waiting) in the definition had to occur for the strategy to have been implemented correctly. However, if the child responded within the 3 s wait time, the strategy still would have been implemented correctly. If the child did not respond within the 3 s wait time, then the caregiver was instructed to use one of the follow-up strategies. While in the intervention phase, if the caregivers’ use of the prompting strategies had occurred in less than 20% of the intervals during a video recorded shared book reading session, and then another instructional session would have been conducted with the caregiver.

**Weekly Reviews**

In addition to the 1-hour instructional session with the caregivers following the baseline phase, the researcher met weekly with each caregiver during the intervention phase to verbally review the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting
strategies). That is, the researcher verbally defined each of the five prompting strategies, answered any questions about the strategies, and encouraged caregivers to continue to use the strategies during shared book reading sessions (Woods et al., 2004). These weekly meetings to review the intervention and collected the video recorded sessions were approximately 30 min in duration.

**Dependent Variables and Observational Coding Definitions**

This section describes the dependent variables on which data were collected from video recorded sessions during each phase of the study. The observational codes are defined for (a) caregiver use of the initial prompting strategies and follow-up prompting strategies during shared book reading sessions, and (b) child use of communicative forms and communicative functions during shared book reading sessions. In addition, the procedure for calculating the duration of the video recorded shared book reading sessions is described.

**Caregiver-Implemented Strategies**

The purpose of the proposed study was to determine: (a) if instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions at home. During each phase of the study, data were collected on dependent variables for each caregiver-child dyad. The dependent variables were: the caregiver’s use of the initial and follow-up prompting strategies. The associated dependent variables to determine possible corollary changes in the child’s
communicative behaviors were the child’s use of communicative forms and communicative functions during shared book reading sessions.

To collect data on these dependent variables, the researcher observed video recorded shared book reading sessions in which each caregiver-child dyad participated. During the viewing of each video recorded session the researcher coded for the caregiver’s use of the prompting strategies and his/her child’s use of communicative forms and communicative functions.

Definitions of the five prompting strategies on which the caregivers received instruction are listed below. These definitions were provided to each caregiver during their instructional session with the researcher (see Appendix G). These definitions also were listed in a manual used by the researcher and second observer during coding of the video recorded sessions (see Appendix F for the coding manual).

**Prompting strategies**

Two types of prompting strategies were used in the study. These were: initial prompting strategies and follow-up prompting strategies. For the purpose of the present study, the initial prompting strategies represent the initial bids from the caregiver to elicit communication from his/her child. As an example, a caregiver might use label-and-wait as an initial bid for his/her child to communicate (e.g., *labels* a picture in a book *and waits*). This initial prompting strategy (i.e., label-and-wait) provides an opportunity for the child to respond to the caregiver. The child might respond with a communicative form and function (e.g., *canonical vocalization* to *respond* to the caregiver) and the caregiver might respond with social praise or a verbal affirmation of the child’s response. See Appendix F for a list of definitions and examples of initial prompting strategies.
**Label-and-wait.** The first initial prompting strategy taught to a caregiver for use during shared book reading with his/her child was label-and-wait. When using this prompting strategy, the caregiver identifies (i.e., names or makes the sound of) objects, pictures, and words to which his/her child already is focused, and then waits up to 3 seconds for the child’s response (Paparella & Kasari, 2004; Rocha et al., 2007; Whalen & Schreibman, 2003).

**Tap-and-wait.** The second initial prompting strategy taught to a caregiver for use during shared book reading with his/her child was tap-and-wait. When using this prompting strategy, the caregiver repeatedly touches objects or pictures to shift their child’s focus to a new location, and then waits up to 3 seconds for the child’s response (Paparella & Kasari, 2004; Rocha et al., 2007; Whalen & Schreibman, 2003).

**Request-and-wait.** The third initial prompting strategy taught to a caregiver for use during shared book reading with his/her child was request-and-wait. When using this prompting strategy, the caregiver asks the child to point to an object or picture, label an object or picture, or act on an object or picture, then waits up to 3 seconds for the child’s response (Light et al., 1994; Paparella & Kasari, 2004).

**Follow-up strategies**

Each caregiver received instruction on two strategies that provide follow-up prompts. See Appendix F for a list of the follow-up prompting strategies. These prompts were to be used in conjunction with initial prompts and were taught to the caregivers as options for prompting their children to respond, when the child did not respond to the caregiver’s initial prompt for communication. For example, if the caregiver used tap-and-wait to provide the initial bid for communication by tapping a picture in a book and waiting 3 s for the child to respond, and the child did not respond, then the caregiver
could use a follow-up prompt (e.g., helping) to prompt the child to look at the picture. In this example, the caregiver could place the child’s hand on the picture in the book to help the child shift attention to that picture. If the child shifted attention to the picture, then the caregiver would provide social praise to the child.

**Helping.** The first follow-up prompting strategy taught to caregiver for use during shared book reading with his/her child was helping. Following an initial bid for communication (i.e., label and wait, tap and wait, request and wait), if the child did not respond, the caregiver would assist his/her child to attend to the picture in the book by placing their child’s hand on the object or picture (Rocha et al., 2007; Whalen & Schreibman, 2003).

**Modeling.** The second follow-up prompting strategy taught to a caregiver for use during shared book reading with his/her child was modeling. Following the caregiver’s initial bid for communication (i.e., label and wait, tap and wait, and request and wait), if his/her child does not respond in the desired manner, the caregiver can: (a) perform the expected child behavior (e.g., repeat the child’s utterance or repeat the child’s action) for the purpose of showing the child how to perform the expected behavior (Paparella & Kasari, 2004); or (b) expand on the child’s utterance (e.g., Child says, “bear,” then caregiver says, “brown bear”).

**Child Communicative Behaviors**

During the second viewing of each video recorded session the researcher coded the child’s use of communicative forms and communicative functions. The codes for child communicative behaviors were: (a) four types of child communicative forms - vocalization, canonical vocalization, single word, word combinations; and (b) two types of child communicative functions – initiating, responding. See Appendix F for definitions.
and examples of communicative forms and functions. These definitions were provided to the caregivers during the instructional sessions (see Appendix G) and were listed in a manual used by the researcher and second observer while they coded the video recorded sessions (see Appendix F for definitions).

**Communicative forms**

For the present study, communicative forms are defined as vocalizations, canonical vocalizations, single words, or word combinations directed at the caregiver and used to express a communicative function. For example, if a child points to a picture of a dog in the book and labels the picture using the canonical vocalization “da”, while engaged in shared book reading with the caregiver, this would be counted as use of the communicative form of canonical vocalization. For purposes of the present study, data were collected only on communicative forms that related to the shared book reading and were directed at the caregiver. See Appendix F for a list of the communicative forms, definitions, and examples.

**Canonical vocalization.** A canonical vocalization is defined as an utterance or vocalization that has at least one consonant-vowel sequence that is coordinated with attention to the caregiver or object of interest related to the activity (Yoder et al., 1998).

**Vocalization.** Vocalizations are defined as productions of a stream of air that consist at least of a voiced vocalic or consonant syllabic element directed toward the caregiver or object of interest related to the activity (Rescorla & Ratner, 1996). For example, a vocalization was coded when a child utters “a” while pointing to an object or picture.

**Single Word.** A single word is defined as a vocalization that consists of an utterance recognized as a conventional spoken word directed toward the caregiver or
object of interest related to the activity. If more than one word was uttered it then was coded as a multiple word (McLean, Brady, McLean, & Behrens, 1999).

**Multiple words.** A multiple word utterance is defined as a vocalization that consists of an utterance recognized as conventional spoken words and consists of more than one word directed toward the caregiver or object of interest related to the activity (McLean et al., 1999).

**Communicative functions**

According to Rowland (2009), a communicative function is the intent or purpose of communication directed at the caregiver to initiate, respond, request, comment, protest, greet, label, or confirm/reject. For the present study, the communicative functions of initiating and responding were coded when the child attempted to communicate about the book used during a shared book reading session. Other communicative functions (i.e., commenting, protesting, greeting, label, confirm, reject) used by the child were not coded. The communicative functions coded are listed below. See Appendix F for a list of the communicative functions, definitions, and examples.

**Initiating.** Initiating is defined as any attempt by the child to begin to participate or interact with the caregiver or shift focus during the session to a different picture (Trudeau et al., 2003). This includes the child’s attempts to comment about or identify an object, action, or person; or attempts to request information or action.

**Responding.** Responding is defined as any attempt by the child to participate or interact following a bid for interaction from the caregiver (Trudeau et al., 2003).

**Duration of Shared Book Reading Sessions**

The duration of each video recorded shared book reading session was calculated. Session duration was calculated from the time the caregiver opened the book or began
to talk about the book, to the time the caregiver closed the book, stopped talking about the book, or ceased video recording, whichever came first (Skotko et al., 2004).

**Research Procedures**

In the present study, data were collected during shared book reading across three phases: baseline, intervention, and maintenance. Prior to data collection, the researcher provided books for the dyad to use and instructed each caregiver on the use and placement of a digital video recorder and tripod to record their shared book reading sessions with their child. Between the baseline and intervention phases, the researcher also instructed each caregiver on the setting the environment procedure, initial prompting strategies, and follow-up prompting strategies (i.e., the caregiver-implemented shared book reading intervention), and the caregiver’s use during shared book reading with his/her child. For consistency, only one caregiver in the family received instruction on both the video recording and the intervention. That caregiver was the only adult participant engaged in shared book reading during the video recorded sessions.

The sections below detail the research procedures used for the study. First, procedures are described for instruction of the caregivers on the use of the digital video recorder. Second, procedures are detailed for the baseline phase. Third, procedures are described for providing instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) for the caregivers between the baseline and intervention phases of the study. Finally, procedures are described for the intervention and maintenance phases of the study.
Caregiver Instruction on Video Recording

Each caregiver received instruction on use of the digital video camera and tripod. For each caregiver, the researcher demonstrated the steps for setting up the video camera and capturing the sessions. The steps were: (a) plugging in the camera and charging the battery for the camera; (b) attaching the tripod to the bottom of the camera; (c) connecting the wireless receiver and transmitter; (d) positioning the camera; (e) recording the sessions; (f) reviewing the recorded sessions; and (g) recharging for the next session. Each caregiver then demonstrated each step to the researcher to verify their ability to use the digital camera. These steps were printed on a handout (see Appendix K for the handout on video recording) for the caregivers to use for the duration of the study.

Baseline Phase

During baseline, each caregiver was instructed to set up the digital video camera and then engage in shared book reading as they typically would with their child. Dyad 1 began the study in true baseline phase and video recorded three shared book reading sessions within 1 week with no more than two sessions video recorded per day to ensure that sessions would be distributed across at least 2 days in the week. For both caregiver-child dyads 2 and 3, shared book reading sessions were probed 1 time per week when they began the baseline phase. Each week, the researcher collected the videos from the caregivers and coded the video recorded content.

The data for caregiver-child dyad 1 were examined for variability, level, and trend. When the data for caregiver-child dyad 1 were stable across at least three sessions, the researcher instructed the caregiver on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-
up prompting strategies) and the dyad then began the intervention phase. At that time, caregiver-child dyad 2 was asked to begin to video record three shared book reading sessions per week until their data were stable, and data points for dyad 1 showed a change in level between baseline and intervention phase. During these weeks, dyad 3 continued probe sessions in the baseline phase (i.e., video recording 1 time per week).

During the baseline phase, the researcher watched the videos and documented each shared book reading session weekly for procedural fidelity (i.e., use of the books provided and video recorder). The videos also were coded for dependent variables: (a) the caregiver’s use of the five prompting strategies; and (b) the child’s use of four communicative forms and two communicative functions, and (c) the duration of each session. Baseline data for the dependent variables were graphed for the caregiver’s use of the initial prompting strategies and follow-up prompting strategies, the child’s use of four communicative forms and two communicative functions, and the duration of the shared book reading sessions. The graphs were visually inspected for variability, level, and trend within and across phases and participants. When true baseline data for the caregiver’s use of the initial and follow-up prompting strategies collected during at least three consecutive shared book reading sessions were stable, the researcher provided instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) for the caregiver.

**Caregiver Instruction**

Before initiating the intervention phase, the researcher instructed each caregiver on the setting the environment procedure and the initial prompting strategies (i.e., label-and-wait, tap-and-wait, request-and-wait), and the follow-up prompting strategies (i.e.,
helping, modeling) for use with his/her child. The setting the environment procedure and the initial and follow-up prompting strategies were taught only to the caregiver who consistently participated in the caregiver-child dyad during shared book reading. The instruction contained: setting the environment procedure, three initial prompts (i.e., label-and-wait, tap-and-wait, request-and-wait), and two follow-up prompts (i.e., helping, modeling). See Appendix F for definitions and examples of setting the environment procedure and the prompting strategies.

A 1-hour caregiver instructional session was conducted in the home of each caregiver-child dyad and consisted of four steps (Rocha et al., 2007; Woods et al., 2004). First, the researcher discussed with the caregivers the benefits of shared book reading for their children and the importance of communication. Second, the researcher defined for the caregiver setting the environment procedure and the initial prompting strategies, and the follow-up prompting strategies (see Appendix F), and provided a handout explaining each strategy (see Appendix G). During the instructional session, the caregiver had an opportunity to ask questions about the strategies, and to make comments to verify their understanding of the setting the environment procedure and the initial prompting strategies, and the follow-up prompting strategies. Third, the researcher modeled with the caregiver the use of setting the environment procedure and each initial prompting strategy and follow-up prompting strategy during shared book reading. Fourth, the caregiver demonstrated for the researcher the use of each of the initial and follow-up prompting strategy during a simulated shared book reading session and the researcher provided corrective feedback as needed throughout the session. This simulated shared book reading session continued until the caregiver independently
implemented the three initial prompting strategies and two follow-up prompting strategies three times each with 100% accuracy during a 15 min role-play session (Woods et al., 2004). For the use of the strategies that contain waiting (i.e., label-and-wait, tap-and-wait, and request-and-wait), both components of the strategy (i.e., the action of label, tap, or request and waiting) in the definition had to occur for the strategy to have been implemented correctly. However, if the child responded within the 3 s wait time, the strategy still would have been implemented correctly. If the child did not respond within the 3 s wait time, then the caregiver was instructed to use one of the follow-up strategies. If the caregivers’ use of the five prompting strategies occurred in less than 20% of the intervals (Rocha et al., 2007) then a booster instructional session would have been provided on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies). The booster instructional session would have been a 1-hour instructional session consistent with the first caregiver instructional session conducted between the baseline and intervention phases.

**Intervention Phase**

Following the caregiver instructional session on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) for a given dyad, the intervention phase began for that dyad. The caregivers continued to video record their shared book reading sessions with their children 3 times per week, with video recorded sessions occurring on at least 2 days of the week. During the intervention phase, the researcher met weekly with each caregiver to verbally review the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-
up prompting strategies). That is, the researcher verbally defined each of the five prompting strategies, answered any questions about the strategies, and encouraged caregivers to continue to use the strategies during shared book reading sessions (Woods et al., 2004).

During the intervention phase, the researcher first watched the videos and documented each shared book reading session weekly for procedural fidelity (i.e., use of the books provided, video recorder, and setting the environment procedure). The videos also were coded for dependent variables: (a) the caregiver’s use of the five prompting strategies, and (b) the child’s use of four communicative forms and two communicative functions. Intervention phase data for the dependent variables were graphed for the caregiver’s use of the initial prompting strategies and follow-up prompting strategies, the child’s use of four communicative forms and two communicative functions, and the duration of the shared book reading sessions. The graphs were visually inspected for variability, level, and trend within and across phases. When the caregivers’ data during the intervention phase revealed a change in level from baseline data and were stable across a minimum of seven sessions, the decision was made to shift the dyad into a maintenance phase. The researcher then met with the caregiver to discuss the decreased frequency of video recorded shared book reading sessions for the maintenance phase.

**Maintenance Phase**

During the maintenance phase, caregivers were instructed to video record one shared book reading session per week for 4 weeks. During the maintenance phase, the researcher collected the videos at 2-week intervals (i.e., at end of week 2 and week 4 of the maintenance phase), and did not discuss the prompting strategies with the
caregiver. Consistent with the baseline and intervention phases, during the maintenance phase, the researcher first watched the videos and documented each shared book reading session weekly for procedural fidelity (i.e., use of the books provided, video recorder, and setting the environment procedure). The videos then were coded for dependent variables: (a) the caregiver’s use of the five prompting strategies; and (b) the child’s use of four communicative forms and two communicative functions. Maintenance data for the dependent variables were graphed for the caregiver’s use of the initial prompting strategies and follow-up prompting strategies, child’s use of four communicative forms and two communicative functions, and duration of the shared book reading sessions. The graphs were visually inspected for variability, level, and trend within and across phases.

The data collected during the maintenance phase were reviewed to determine if each caregiver maintained the use of the initial and follow-up prompting strategies, and if his/her child maintained the use of communicative forms and communicative functions documented during the intervention phase, while (a) meeting with the researcher every 2 weeks to transfer the video recorded sessions, (b) decreasing the frequency of video recorded shared book reading sessions to 1 time per week, and (c) not participating in a weekly review of the strategies with the researcher. One shared book reading session was video recorded weekly during the maintenance phase.

**Data Collection and Analysis Procedures**

For the dependent variables, the caregiver’s use of the initial and follow-up prompting strategies, and the child’s use of the four communicative forms and two communicative functions, the researcher coded each video recorded shared book reading session, graphed those data, and analyzed the data. For the dependent
variable of duration of the shared book reading session, the researcher graphed the duration, in seconds, for each shared book reading session. This section details those procedures as well as data collection and analysis procedures related to interobserver agreement, fidelity of the caregiver instruction, procedural fidelity, and social validity.

**Collection and Analysis of Dependent Variables**

Analysis of the dependent variables was conducted from the observations of behavior observed on the video recorded sessions of each dyad’s shared book reading sessions for each phase of the study (i.e., baseline phase, intervention phase, and maintenance phase). This section describes the process for coding, graphing, and analyzing two dependent variables: (a) caregivers’ use of the initial and follow-up prompting strategies and (b) communicative forms and functions. The process also is described for graphing and analyzing the dependent variable of duration of the shared book reading sessions.

**Coding data**

Before marking the occurrence of each behavior, the researcher first marked the beginning and ending of the session according to the procedure for determining the duration of the shared book reading session, and documented if the caregiver followed the video recording procedures for all shared book reading sessions and for setting the environment during the intervention and maintenance phases of the shared book reading sessions. Then, the video recorded shared book reading session was divided into 3 s intervals. Using ProcoderDV™ (Tapp, 2002) software, the researcher observed the videos and coded the occurrence and nonoccurrence of targeted behaviors (i.e., five prompting strategies, four communicative forms and two communicative functions) exhibited by the caregiver-child dyads during each 3 s interval of the shared book
reading sessions. The targeted behaviors (i.e., five prompting strategies, four communicative forms and two communicative functions) were marked as event codes using partial-interval coding procedures. More than one event code could have been coded during an interval. For example, a child could use the communicative forms of vocalization and canonical vocalization during one interval. In partial-interval coding, the observation of a behavior is coded once during an interval in which it occurs, regardless of the number of times that behavior occurs within that interval (Kennedy, 2005). The participant needs to engage in a targeted behavior only long enough for the observer to recognize that the behavior has occurred (Gast, 2010). The use of interval coding accommodates for variations in the duration of the video recorded sessions. When the last interval for a session was less than 3 s, it was not calculated in the number of intervals. The researcher used partial-interval coding procedures to mark the occurrence and nonoccurrence of the caregiver’s use of the initial and follow-up prompting strategies and the child’s use of four communicative forms and two communicative functions. For the present study, the targeted behaviors (i.e., initial and follow-up prompting strategies, four communicative forms and two communicative functions) were marked as event codes when they occurred during each 3 s interval resulting in occurrence data for each initial prompting strategy, follow-up prompting strategy, communicative form, and communicative function.

The occurrence of a targeted behavior was marked in one of two ways. First, when the targeted child behavior (i.e., four communicative forms and two communicative functions) was observed as defined in the observational code definitions (see Appendix F for code definitions). For example, for the occurrence of a vocalization, the observer
marked the occurrence of that communicative form in the interval during which it occurred. Second, when the use of a targeted behavior (i.e., five prompting strategies) began in one interval but was not completed until the next interval, it only was marked as observed in the second interval. For example, for the occurrence of the initial prompting strategy *label-and-wait*, the observer marked the occurrence of the strategy only after both components of the strategy (i.e., label and wait) were observed.

After marking the beginning and the ending of the sessions and dividing the session into 3 s intervals, the researcher viewed each session twice. In the first viewing, the researcher observed the session and marked the occurrence of the caregiver’s use of the three initial prompting strategies and two follow-up prompting strategies. In the second viewing, the researcher marked the occurrence and nonoccurrence of the child’s use of four communicative forms and two communicative functions.

**Graphing data**

The researcher printed out a ProcoderDV™ (Tapp, 2002) generated form that lists the occurrence of each code selected per interval during the observation of each shared book reading session. The researcher then calculated the percent of intervals per session during which each caregiver used each of the three initial prompting strategies and two follow-up prompting strategies and each child used each of the four communicative forms and two communicative functions. To calculate the percent of intervals during which each behavior occurred, first the researcher determined the total number of 3 s intervals comprised in each video recorded session, the number of intervals during which the behavior occurred during the video recorded session, and the number of intervals during which the behavior did not occur during the video recorded session. Then, the researcher divided the number of intervals of occurrence by the
number of intervals of occurrence plus the number of intervals of nonoccurrence (i.e., the total number of intervals in the sessions) and multiplied by 100. The percent of interval occurrence and nonoccurrence data were displayed in graphs for each of the five prompting strategies, and for each of the four communicative forms and two communicative functions per session. The percent of intervals occurrence and nonoccurrence data also were displayed in graphs for each caregiver’s combined use of the three initial prompting strategies and two follow-up prompting strategies (i.e., the use of any prompting strategy during an interval).

Analyzing data

Visual analysis of variability, level, and trend of the data points on each graph was used to determine if changes in the dependent variables (i.e., the caregiver’s use of the five prompting strategies, the child’s use of the four communicative forms and two communicative functions, and the duration of the session) occurred following the provision of instruction with each caregiver (Kennedy, 2005). The variability of the data points within phases was inspected visually to determine how different the data points were from each other. This was determined by evaluating the vertical variability between sequential data points.

The level of the data points for each phase was calculated per participant by determining the median and mean for the data within the phase. The data were inspected visually to determine if a trend was present within each phase. This was determined by evaluating the magnitude and slope of the data points.

Duration of Shared Book Reading Sessions

The duration of each video recorded shared book reading session was calculated. Session duration was calculated from the time the caregiver opened the book or began
to talk about the book, to the time the caregiver closed the book, stopped talking about
the book, or ceased video recording, whichever came first (Skotko et al., 2004). The
duration of each session was calculated to the nearest second and displayed in graphs.
The graphs were analyzed for changes in the duration within and across phases of the
study.

**Interobserver Agreement**

To establish interobserver agreement, a doctoral student recruited from the School
of Special Education, School Psychology, and Early Childhood Studies at UF served as
a second observer. The second observer was familiarized with the use of
ProcoderDV™, code definitions for the child behaviors (i.e., four communicative forms
and two communicative functions) and definitions of the five prompting strategies The
researcher and second observer practiced coding sample video recorded shared book
reading sessions of caregiver-child dyads that were not participants in the study. The
researcher and second observer also observed and coded occurrence and
nonoccurrence of the targeted behaviors observed in the videos independently, then
compared their codes, and developed decision rules for each code. These decision
rules were listed in the coding manual used during the coding of the video recorded
sessions (See Appendix F for the coding manual). Once the coders reached at least
80% agreement on five consecutive clips coded, they began coding the participants
video recorded shared book reading sessions. To monitor interobserver agreement
during the study, the second observer viewed 32% of the video recorded sessions
weekly and the researcher evaluated interobserver agreement. Interobserver
agreement of 80% was the criterion established for the all codes combined and for each
code used in the present study.
To determine interobserver agreement, the researcher compared the lists of behaviors generated from ProcoderDV™ (Tapp, 2002) for each session coded by the researcher and the second observer. The researcher compared the lists and marked each interval for agreement or disagreement for the occurrence or nonoccurrence of each initial prompting strategy and follow-up prompting strategy, and each child communicative form and function. Occurrence of agreement was calculated using the time-window method for computing agreement (Kern, Starosta, & Adelman, 2006). With this method, agreement was scored when the second observer and researcher observed the target behavior occurred within 6 s of each other. The researcher then calculated the number of agreements and disagreements then divided the number of agreements by the number of agreements plus the number of disagreements, and then multiplied by 100. Calculations were conducted similarly for the nonoccurrence agreement. This yielded a percent of occurrence and nonoccurrence agreement per dependent variable.

Interobserver agreement also was used to determine interobserver agreement for the Unstructured Joint Attention Assessment (Loveland & Landry, 1986). A second observer viewed the video recording of the assessments conducted by the researcher. The scoring sheets from the researcher and second observer then were compared. The researcher calculated the number of agreements and disagreements, divided the number of agreements by the number of agreements plus the number of disagreements, and the multiplied by 100. This yielded a percent of agreement for the Unstructured Joint Attention Assessment.
Fidelity of Caregiver Instruction

To ensure that instruction for the caregivers was implemented consistently across caregiver-child dyads, the same instruction was delivered across each dyad. The researcher followed a checklist for each instructional session to ensure that each step in the process was completed (see Appendix L for the caregiver instruction checklist). Caregivers then signed the checklist to acknowledge their understanding of the components of the intervention package. The researcher used a form to document each caregiver’s independent implementation of the strategies three times with 100% accuracy during a 15 min role-play session (Woods et al., 2004). See Appendix M for scoring sheet for caregiver use of initial and follow-up prompting strategies.

Procedural Fidelity

Procedural fidelity was measured through the observation of three aspects of the treatment. First, caregivers were instructed on the use of the video recorder to capture the shared book reading session. Each caregiver’s use of the video recorder to capture the shared book reading session such that the child, the caregiver, and the book could be viewed throughout the session was observed during the coding of the data and documented.

Second, each caregiver received books from the researcher that were to be used during the shared book reading sessions. The caregivers’ use of only these books during the shared book reading was documented during the coding of the data and documented for procedural fidelity.

Finally, data were collected for procedural fidelity on whether or not the caregiver set the environment for the shared book reading. That is, the shared book reading session was conducted in a consistent location in the home that was free from
distraction, and the caregiver, child, and book were positioned such that the child could see the caregiver's face and the book, and the caregiver could see the child's face and the book. Use of the procedure for setting the environment was observed during the coding of the sessions and documented.

**Social Validity**

Social validity data were collected to gather the caregivers’ perspectives about the strategies. Upon completion of the study, the caregivers were asked to complete a questionnaire regarding the user-friendliness, strengths, and weaknesses of the prompting strategies. Specifically, caregivers were questioned about: (a) the impact of the use of the shared book reading intervention on their child’s communication; (b) the most valuable component of the shared book reading intervention; and (c) the benefit of the shared book reading intervention for them and their children (see Appendix N for the social validity questionnaire).
Table 3-1. Characteristics of caregiver-child dyads

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Hunter</th>
<th>Charlie</th>
<th>Heather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>23</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>BDI-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subdomain scaled scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(age equivalency in months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Receptive communication</td>
<td>1 (8)</td>
<td>1 (11)</td>
<td>4 (26)</td>
</tr>
<tr>
<td>□ Expressive communication</td>
<td>2 (10)</td>
<td>3 (14)</td>
<td>1 (11)</td>
</tr>
<tr>
<td>Other area of significant delay</td>
<td>Adaptive</td>
<td>Personal Social</td>
<td>Motor</td>
</tr>
<tr>
<td>Caregiver’s primary concern</td>
<td>Communication</td>
<td>Communication</td>
<td>Sitting up and Talking</td>
</tr>
<tr>
<td>SBFRS (range = 0 to 13)</td>
<td>10</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Hollingshead Four-Factor Index</td>
<td>Medium business, minor professional, technical</td>
<td>Major business, professional</td>
<td>Skilled craftsmen, clerical, sales workers</td>
</tr>
<tr>
<td>Social Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstructured Joint Attention Assessment</td>
<td>9 of 10 bids</td>
<td>9 of 10 bids</td>
<td>8 of 10 bids</td>
</tr>
<tr>
<td>ABILITIES Index</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding others</td>
<td>Moderate disability</td>
<td>Suspected disability</td>
<td>Moderate disability</td>
</tr>
<tr>
<td>Communicating w/others</td>
<td>Moderate disability</td>
<td>Moderate disability</td>
<td>Moderate disability</td>
</tr>
</tbody>
</table>

Figure 3-1. Hunter's functional abilities profile
Figure 3-2. Charlie’s functional abilities profile
Figure 3-3. Heather’s functional abilities profile
CHAPTER 4
RESULTS

The purpose of this chapter is to present the results of the study. First, interobserver agreement was calculated for each Unstructured Joint Attention Assessment (UJA; Loveland & Landry, 1986). Interobserver agreement also was calculated across the phases to determine the reliability of the coding definitions and observations. These data are presented in the sections below and in tables at the end of the chapter. Next, the intervention results are presented for each caregiver and child participant, both within and between the three phases (i.e., baseline, intervention, and maintenance) of the study. In addition, fidelity of the caregiver instruction is presented. Procedural fidelity data are presented on the caregivers’ implementation of the procedures for video recording the sessions and using the books provided by the researcher, as well as for the setting the environment procedure. Finally, social validity data are presented.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for the Unstructured Joint Attention assessment (UJA) to determine the reliability of the scores obtained. In addition, interobserver agreement was calculated for the dependent variable of the caregivers’ use of the initial and follow-up prompting strategies and the children’s use of communicative forms and functions.

Interobserver Agreement for the Unstructured Joint Attention Assessment

Interobserver agreement was obtained for the Unstructured Joint Attention (UJA) at 80% across all three assessments. That is, for Hunter IOA on the UJA was obtained at 80%, at 70% for Charlie, and at 90% for Heather.
Interobserver Agreement for the Dependent Variables

Using 32% of the shared book reading sessions, interobserver agreement also was calculated across all participants for the dependent variables: caregiver use of the initial and follow-up prompting strategies and child use of communicative forms and functions across the baseline, intervention, and maintenance phases. IOA was not calculated for the duration of the sessions. To select the video recorded sessions for IOA, the researcher created a list of videos collected during the week and marked every third video for coding by the second observer. Interobserver agreement was calculated for percent agreement of occurrence and nonoccurrence of the behaviors. These calculations were rounded to the nearest whole number and discussed below.

Interobserver agreement for prompting strategies

Interobserver agreement (IOA) for the caregivers’ use of the initial and follow-up prompting strategies overall was 95% for occurrence and 98% for nonoccurrence. For the initial prompting strategy of label-and-wait IOA was 91% (range = 71% to 100%) for occurrence and 100% (range = 98% to 100%) for nonoccurrence. For the initial prompting strategy of tap-and-wait, IOA was 98% (range = 83% to 100%) for occurrence and 100% (range = 99% to 100%) for nonoccurrence. For request-and-wait, IOA was 95% (range = 75% to 100%) for occurrence and 99% (range = 94% to 100%) for nonoccurrence. For follow-up prompting strategies, IOA was calculated at 100% for occurrence and nonoccurrence of helping. For modeling, IOA was 95% for occurrence and 100% for nonoccurrence.

Interobserver agreement for communicative forms and functions

Regarding child use of communicative forms, the overall interobserver agreement (IOA) was 95% for occurrence and 97% for nonoccurrence. For vocalizations, IOA was
94% (range = 71% to 100%) for occurrence and 99% (range = 90% to 100%) for nonoccurrence. Agreement for canonical vocalizations was 94% (range = 67% to 100%) for occurrence and 99% (range = 95% to 100%) for nonoccurrence. For both multiple words and single words, IOA was 100% for both occurrence and nonoccurrence.

Regarding child use of communicative functions, interobserver agreement (IOA) for initiating was 95% (range = 70% to 100%) for occurrence and 99% (range = 90% to 100%) for nonoccurrence. For responding IOA was 93% (range = 50% to 100%) for occurrence and 99% (range = 85% to 100%) for nonoccurrence. See Table 4-1 for interobserver agreement for each dependent variable.

**Intervention Results**

Baseline, intervention, and maintenance phases were conducted with each dyad. For each phase, the researcher calculated the percent of intervals per session during which each caregiver used each of the three initial prompting strategies and the two follow-up prompting strategies to determine whether there was a functional relationship between the intervention (i.e., instruction on caregiver-implemented shared book reading intervention) and caregivers’ use of prompting strategies. These data are shown in Figures 4-1 through 4-8 for the five prompting strategies collectively and for the five prompting strategies separately. These data are discussed below for each of the caregivers.

In addition, for each phase, the researcher calculated the percent of intervals per session during which each child participant used each of the four communicative forms and two communicative functions to determine whether there was a corollary change in the children’s communicative behaviors. These data are presented in Figures 4-9 through 4-16 and are discussed below for each of the child participants.
Each Caregiver's Use of the Prompting Strategies

Because the purpose of the study was to determine: (a) if instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children's use of communicative forms and functions during shared book reading sessions at home, the data are presented first for each caregiver in Figure 4-1 and are differentiated by phase (i.e., baseline, intervention, maintenance). For Figure 4-1, the percent of intervals per session was calculated by dividing the number of intervals the caregiver used any of the five prompting strategies (i.e., initial or follow-up) by the number of intervals in the session, and then multiplying by 100. Each data point in Figure 4-1 represents the percent of intervals during which the caregiver used a prompting strategy during that shared book reading session with his/her child. The data in Figure 4-1 for each caregiver are discussed in the following sections.

The percent of intervals per session during which each caregiver used any of the three initial prompting strategies is presented in Figure 4-2 across baseline, intervention, and maintenance phases. Figures 4-3 through 4-5 present data on the percent of intervals per session during which each caregiver used each of the three initial prompting strategies.

Similarly, the percent of intervals per session during which each caregiver used either of the two follow-up prompting strategies is presented in Figure 4-6 across phases. Figures 4-7 and 4-8 present data on the percent of intervals per session during
which each caregiver used each of the two follow-up prompting strategies. The data for each caregiver are discussed in the following sections.

**Hunter’s caregiver**

Hunter’s caregiver was the first participant to begin true baseline phase. The dyad recorded three shared book reading sessions per week during the first week of the study.

**Baseline phase for Hunter’s caregiver.** For the baseline phase, the percent of intervals during which Hunter’s caregiver used any of the five prompting strategies averaged 5%, with a range of 0% to 15%. His caregiver used the initial prompting strategies in an average of 3% (range = 0% to 9%) of the intervals, and follow-up prompting strategies in an average of 2% (range = 0% to 6%) of the intervals. Specifically, Hunter’s caregiver used two of the three initial prompting strategies: label-and-wait (average of 2%; range = 0% to 6%) and request-and-wait (average of 1%; range = 0% to 4%). His caregiver also used one of the two follow-up prompting strategies, which was modeling (average of 1%; range = 0% to 5%).

The data collected during baseline phase were visually inspected for the variability, level, and trend. To address variability, the researcher used a stability envelope. According to Gast (2010), if 80% of the data points fall within 25% of the median, then the data are considered stable, if 80% do not fall within this range, then the data are deemed variable. To calculate the stability envelope, the researcher determined the median for the baseline phase (1.34%) then multiplied the median by 0.25, resulting in a stability envelope for the combined use of the initial and follow-up prompting strategies of 0.33%. This envelope then was superimposed over the median
line. Based on these calculations, the data for Hunter’s caregiver were considered variable for the baseline phase.

To address level, the researcher calculated the median for the baseline phase. The median level was 1.34%, which was low considering the possible range was 0% to 100%. To estimate the trend direction, a split-middle half method was used, which showed a slight accelerating trend when examining the four data points in the baseline phase. However, because the level of the data was low and the trend between the third and fourth data point for the phase showed a decelerating trend, the decision was made to begin the intervention phase. According to Kazdin (1982), when levels are low, there is leniency toward variability. After 4 baseline sessions, instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was conducted with Hunter’s caregiver in their home following the protocol described in Appendix G.

**Intervention phase for Hunter’s caregiver.** Following the instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), the percent of intervals during which Hunter’s caregiver used any of the five prompting strategies changed in level from an average of 5% (range = 0% to 15%) in the baseline phase, to an average of 36% (range = 20% to 72%) in the intervention phase. The percentage of intervals during which Hunter’s caregiver used the initial prompting strategies increased from an average of 3% (range = 0% to 9%) during the baseline phase to an average of 20% (range = 8% to 27%) during the intervention phase. A breakdown of the data to reflect each of the three initial prompting strategies during the intervention phase
showed that Hunter’s caregiver used the request-and-wait prompting strategy an average of 11% (range = 8% to 15%) of the intervals, the label-and-wait prompting strategy an average of 7% (range = 0% to 18%), and the tap-and-wait prompting strategy an average of 1% (range = 0% to 5%).

In addition, the percent of intervals during which the two follow-up prompting strategies occurred increased from an average of 2% (range = 5% to 6%) during the baseline phase, to an average of 16% (range = 6% to 39%) during the intervention phase. A breakdown of these data showed that Hunter’s caregiver used modeling in an average of 14% (range = 6% to 39%) of the intervals and helping in an average of 0.35% (range = 0% to 3%) of the intervals.

Based on the stability envelope of 0.33%, the data collected during the intervention phase were variable with 20% of the data points falling within the envelope during the intervention phase, instead of the 80% required to deem the data stable. However, the percent of intervals during which Hunter’s caregiver used the five prompting strategies increased in level, and the data had an accelerating trend after 10 intervention sessions. It was determined, therefore, that the dyad should enter the maintenance phase of the study.

Finally, Gast (2010) describes the use of the percent of non-overlapping (PND) data points comparing the adjacent conditions of baseline and intervention phases to determine the impact of the intervention. The PND is calculated by counting the number of data points in the intervention phase that fall outside the range of the data points in the baseline phase, dividing by the number of data points in the intervention phase, and
then multiplying by 100. The PND for Hunter’s caregiver comparing baseline phase data with intervention phase data was 100%.

**Maintenance phase for Hunter’s caregiver.** Following the last session of the intervention phase, the dyad continued to video record shared book reading sessions, but only 1 time per week during the maintenance phase. At end of 2 weeks and again at the end of 4 weeks, following the last session in the intervention phase, the researcher collected the video recordings of these shared book reading sessions of the maintenance phase data. During these four book reading sessions in the maintenance phase, Hunter’s caregiver used any of the five prompting strategies in an average of 36% (range = 32% to 43%) of the intervals. Overall, there was a decelerating trend in the caregiver’s use of the prompting strategies; however, the caregiver used the three initial prompting strategies in an average of 27% of the intervals during maintenance phase, which is greater than the average of 20% (range = 8% to 27%) during the intervention phase. Specifically, Hunter’s caregiver used label-and wait (average = 10%; range = 7% to 12%), request-and-wait (average = 10%; range = 7% to 13%) and did not use the tap-and-wait initial prompting strategy during the maintenance phase. For the two follow-up prompting strategies, Hunter’s caregiver used the follow-up prompting strategies in an average of 16% (range = 10% to 15%) of the intervals during the maintenance phase. Specifically, Hunter’s caregiver used both modeling (average = 15%; range = 10% to 27%), and helping (average = 1%; range = 0% to 4%) during the maintenance phase.

**Charlie’s caregiver**

During the baseline phase, Charlie’s caregiver initially video recorded probe sessions 1 time per week. At the end of the first 3 weeks of the study, the researcher
instructed Charlie’s caregiver to begin collecting true baseline phase data (i.e., video recording shared book reading sessions three times per week, on at least two of those days). However, Charlie’s caregiver went out of town unexpectedly that week and instead of beginning true baseline, Charlie and his caregiver conducted an additional probe session. This resulted in four baseline probe sessions over the first 4 weeks of the study. During the fifth week of the study, Charlie’s caregiver began to collect true baseline data, conducting three video recorded sessions per week. Additional baseline phase data were collected during the sixth week of the study.

**Baseline phase for Charlie’s caregiver.** During baseline phase, the average percent of intervals during which Charlie’s caregiver used any of the five prompting strategies averaged 9% (range = 4% to 19%). He used the three initial prompting strategies in an average of 8% (range = 4% to 13%) of the intervals. Specifically, Charlie’s caregiver used the initial prompting strategies of label-and-wait (average of 7%; range = 3% to 13%) and request-and-wait (average of 1%; range = 0% to 4%).

In addition, during baseline, Charlie’s caregiver used the two follow-up prompting strategies in an average of 2% (range = 0% to 8%) of the intervals. For all of these occurrences, Charlie’s caregiver used modeling (average of 2%; range = 0% to 8%).

The data collected during baseline phase were visually inspected for the variability, level, and trend. A stability envelope was calculated to determine the variability of the data, resulting in a stability envelope for the combined use of the five initial and follow-up prompting strategies of 2.13%. Based on this calculation, the data for Charlie’s caregiver were considered variable for the baseline phase because only 20% of the data points fell within the stability envelope. The visual analysis also
indicated a slight accelerating trend in the data; however, the data points immediately prior to the intervention phase were decelerating. The median level of 9% was low. Based on the findings from the visual analysis of the data for Charlie’s caregiver, and the accelerating trend of the intervention phase data for Hunter’s caregiver, instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was conducted with Charlie’s caregiver according to the procedures described in Appendix G. During instruction, after the helping follow-up prompting strategy was explained and modeled by the researcher, Charlie’s caregiver objected to the prompting strategy, indicating that he would not use that particular prompting strategy with his child because he felt it was too invasive. Thus, no further instruction occurred relating to the helping follow-up strategy. All the other four strategies were modeled for the caregiver and he met the criteria for demonstrating their use.

**Intervention phase for Charlie’s caregiver.** The percent of intervals during which Charlie’s caregiver used of any of the five prompting strategies changed in level from an average of 10% (range = 4% to 19%) in the baseline phase to an average of 34% (range = 27% to 45%) in the intervention phase. The percentage of intervals during which Charlie’s caregiver used the three initial prompting strategies increased from an average of 8% (range = 4% to 13%) during the baseline phase, to an average of 22% (range = 14% to 26%) in the intervention phase. A breakdown of the three initial prompting strategies shows that during the intervention phase label-and-wait was used in an average of 17% (range = 8% to 25%) of the intervals, request-and-wait was used
an average of 4% (range = 0% to 15%) and tap-and-wait was used an average of 2% (range = 0% to 5%).

In addition, the percent of intervals during which Charlie’s caregiver used the two follow-up prompting strategies increased from an average of 2% (range = 0% to 8%) during the baseline phase to an average of 11% (range = 5% to 27%) during the intervention phase. Modeling occurred in an average of 11% (range = 5% to 25%) of the intervals during the intervention phase, while helping occurred in 0% of the intervals during both the baseline and intervention phases.

Based on the stability envelope of 2.13%, the data collected over 10 shared book reading sessions obtained during the intervention phase were variable with 20% of the data points falling within the stability envelope. However, the percent of intervals during which Charlie’s caregiver used the initial and follow-up prompting strategies increased in level, the data had an accelerating trend, and the percent of non-overlapping data points was 100%. Based on these data, Charlie and his caregiver entered the maintenance phase of the study.

**Maintenance phase for Charlie’s caregiver.** During the shared book reading sessions in the maintenance phase, Charlie’s caregiver used the five prompting strategies in an average of 41% (range = 29% to 52%) of the intervals. The three initial prompting strategies occurred an average of 22% (range = 14% to 26%) of the intervals. Specifically, Charlie’s caregiver used label-and-wait in an average of 20% (range = 8% to 28%) of the intervals, request-and-wait in an average of 7% (range = 3% to 11%), and tap-and-wait in an average of 1% (range = 0% to 3%). The two follow-up prompting strategies occurred in an average of 13% (range = 8% to 18%) of the intervals during
the maintenance phase, with modeling occurring in an average of 13% (range = 8% to 18%) and helping occurring in 0% of the intervals. These data show that the caregiver maintained the use of the prompting strategies at 2 weeks and 4 weeks following the intervention phase at average levels that exceeded the baseline phase level.

**Heather’s caregiver**

Heather’s caregiver began with probe sessions during the baseline phase. After Charlie and his caregiver began the intervention phase and at the end of the first 8 weeks of the study, the researcher determined that Heather’s caregiver should begin collecting true baseline phase data (i.e., video recording shared book reading sessions 3 times per week, on at least two days). However, Heather’s caregiver had an accident and was on bed rest for the 9th week of the study and no probe data session was recorded. During the 10th week of the study, Heather’s caregiver began to collect three shared book reading sessions per week.

**Baseline for Heather’s caregiver.** During baseline phase, the average percent of intervals during which Heather’s caregiver used any of the five prompting strategies was 3% (range 1% to 10%). She used the three initial prompting strategies in an average of 3% (range = 0% to 8%) of the intervals, with all occurrences being the use of request-and-wait (average of 2%; range = 0% to 8%). The two follow-up prompting strategies occurred in an average of 1% (range = 0% to 3%) of the intervals, with all occurrences being modeling (average of 1%; range = 0% to 3%). Based on the stability envelope of 0.6, the data for Heather’s caregiver were considered variable for the baseline phase with 27% of the data points falling within the envelope. However, there was a decelerating trend in the data and the level was considered low. Based on a visual inspection of the data for Heather’s caregiver, and the intervention phase data for
Charlie’s caregiver showing a change in level following instruction with his caregiver, instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was conducted with Heather’s caregiver, according to the procedures described in Appendix G.

**Intervention for Heather’s caregiver.** Following instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), the percent of intervals during which Heather’s caregiver used any of the five prompting strategies increased from an average of 3% (range = 0% to 10%) during the baseline phase to an average of 37% (range = 24% to 44%) for the intervention phase.

Specifically, the percent of intervals during which Heather’s caregiver used the three initial prompting strategies improved from an average of 3% (range = 0% to 8%) during baseline phase to an average of 22% (range = 12% to 29%). A breakdown of the initial prompting strategies shows the percent of intervals during which request-and-wait (average = 18%; range = 12% to 25%) occurred during the intervention phase was greater than the percent of intervals of occurrence for label-and-wait (average = 0%; range = 0% to 6%) or tap-and-wait (average = 0%; range = 0% to 1%).

The percent of intervals during which the two follow-up prompting strategies increased from an average of 1% (range = 0% to 3%) during the baseline phase to an average of 11% (range = 7% to 15%) during the intervention phase, with modeling occurring in an average of 10% (range = 7% to 13%) of the intervals and helping occurring in an average of 0% (range = 0% to 2%). A stability envelope of 0.6% showed
that the data were variable with only 1 of the 12 data points (8%) falling within the envelope. Although the data trend was decelerating there was a positive change in level and the percent of non-overlapping data points was 100%.

**Maintenance for Heather’s caregiver.** During shared book reading sessions in the maintenance phase, Heather’s caregiver used the five prompting strategies during an average of 27% (range = 25% to 31%) of the intervals, with the three initial prompting strategies occurring in an average of 19% (range = 16% to 21%) of the intervals. Specifically, Heather’s caregiver used label-and-wait (average = 1%; range = 0% to 3%) and request-and-wait (average = 18%; range = 16% to 21%) and did not use the tap-and-wait initial prompting strategy during the maintenance phase. The two follow-up prompting strategies occurred in an average of 8% (range = 5% to 11%) of the intervals, with modeling occurring in an average of 8% (range = 5% to 11%) and helping occurring in 0% of the intervals. These data show that the caregiver continued to use the prompting strategies at 2 weeks and 4 weeks following the intervention phase at a level that exceeded that of the baseline phase.

**Children’s Use of Communicative Form and Communicative Functions**

The second purpose of the present study was to determine if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions. In the following sections, the data first are presented for each child’s use of communicative forms in Figure 4-9 and these data are differentiated by phase (i.e., baseline, intervention, maintenance). For Figure 4-9 the percent of intervals per session was calculated by dividing the number of intervals the child used any of the four communicative forms (i.e., vocalization, canonical vocalization, single words, multiple
words) by the number of intervals in the session and then multiplying by 100. Each data point in Figure 4-9 represents the percent of intervals during which the child used a communicative form during that shared book reading session. Figures 4-10 through 4-13 present data on the percent of intervals per session during which each child used each of the four communicative forms.

Similarly, the percent of intervals per session during which each child used either of the two communicative functions (i.e., initiating, responding) is presented in Figure 4-14 across baseline, intervention, and maintenance phases. Figures 4-15 and 4-16 present the data each of the two communicative functions. All three of these data sets for each child are discussed in the following sections.

Hunter

Hunter’s baseline phase. During the shared book reading sessions in the baseline phase sessions, Hunter used only the communicative form of vocalization during an average of 3% (range = 0% to 6%) of the intervals. He did not communicate using canonical vocalizations, single words, or multiple words during baseline phase. The communicative functions of Hunter’s vocalizations were both initiating (average = 2%; range 0% to 6%) communication with his caregiver and responding (average = 1%; range 0% to 5%) to his caregiver.

Hunter’s intervention phase. After Hunter’s caregiver received instruction, the percent of intervals during which Hunter used communicative forms increased from an average of 3% (range = 0% to 6%) of the intervals in the baseline phase to an average of 22% (range = 8% to 53%) during the intervention phase. Vocalizations increased from an average of 3% (range = 0% to 6%) of the intervals in the baseline phase to an average of 9% (range = 0% to 21%) during the intervention phase. In addition, he
increased his repertoire of communicative forms. The occurrence of canonical vocalizations increased from 0% of the intervals in the baseline phase to an average of 12% (range 0% to 38%). In addition, Hunter used a single word (average = 0%; range 0% to 2%) during the intervention phase and multiple words in 0% of the intervals. The data showed a positive change in level between baseline and intervention phases and an accelerating trend in the data. The percent of non-overlapping data points was 90%.

The percent of intervals during which Hunter used communicative functions, increased from an average of 3% (range = 0% to 6%) of the intervals during baseline to an average of 22% (range = 8% to 55%) during the intervention phase. Hunter initiated communication with his caregiver in an average of 5% (range = 0% to 10%) of the intervals and he responded in an average of 17% (range = 8% to 51%) of the intervals. For communicative functions, the data also showed a positive change in level between baseline and intervention phases, with the percent of non-overlapping data points at 90%.

**Hunter’s maintenance phase.** The average percent of intervals during which Hunter used any of the communicative forms during the intervention phase was maintained during follow-up sessions (i.e., average = 26%; range = 19% to 30%). During the maintenance phase, Hunter used vocalizations in an average of 15% (range = 10% to 26%) of the intervals, canonical vocalizations in an average of 8% (range = 3% to 15%), and single words in an average of 3% (range = 0% to 11%). Hunter did not use multiple words during video recorded shared book reading sessions during the maintenance phase.
Regarding the communicative functions of these communicative forms, Hunter used communicative functions in an average of 26% (range = 16% to 33%) of the intervals during the maintenance phase. The percent of intervals during which Hunter initiated communication averaged 12% (range = 2% to 27%) of the intervals and he responded in an average of 14% (range = 7% to 23%).

**Charlie**

**Charlie’s baseline phase.** In shared book reading sessions in the baseline phase, Charlie used communicative forms in an average of 29% (range = 5% to 53%) of the intervals. He used vocalizations in an average of 22% (range = 2% to 42%) of the intervals, and canonical vocalizations occurred in an average of 6% (range = 0% to 16%) of the intervals. He did not communicate using the communicative forms of single words or multiple words during shared book reading sessions in the baseline phase.

Charlie’s use of communicative functions occurred in an average of 29% (range = 8% to 53%) of the intervals during the baseline phase. While the communicative functions mostly were used to initiate (average = 20%; range = 2% to 32%) communication with his caregiver, he also responded to his caregiver in an average of 9% (range = 4% to 13%) of the intervals during the baseline phase shared book reading sessions.

**Charlie’s intervention phase.** After Charlie’s caregiver received instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), the percent of intervals during which Charlie used communicative forms increased from an average of 29% (range = 5% to 53%) in the baseline phase to an average of 32% (range = 14% to 66%) during the intervention phase. His use of vocalizations did not change in level.
between the baseline (average of 22%; range = 2% to 50%) and intervention (average of 22%; range = 2% to 42%) phases. However, the percent of intervals during which he used canonical vocalizations increased from an average of 6% (range 0% to 16%) in the baseline phase to an average of 9% (range = 0% to 17%) during the intervention phase. The percent of intervals during which he used single words increased from an average of 0% in the baseline phase to an average of 2% (range = 0% to 9%) during the intervention phase. Finally, the percent of intervals during which he used multiple words increased slightly from an average of 0% during the baseline phase to an average of 0.36% (range = 0% to 3%) during the intervention phase. While the level change between baseline and intervention was positive, it was slight (3%) and the percent of non-overlapping data points was 20%.

The communicative functions associated with these communicative forms also changed between the baseline and intervention phases; that is, the percent of intervals during which Charlie used the communicative function of initiating decreased from an average of 20% (range = 2% to 32%) in the baseline phase to an average of 15% (range = 2% to 20%) in the intervals during intervention phase. However, his use of responding increased from an average of average of 9% (range = 4% to 13%) of the intervals in the baseline phase to an average of 19% (range = 5% to 48%) of the intervals in the intervention phase. The change in level for communicative functions was similar to communicative forms, with only a slight positive change in level. The percent of non-overlapping data points was 20%.

**Charlie’s maintenance phase.** During the maintenance phase, the percent of intervals during which Charlie used communicative forms averaged 46% (range = 24%
to 66%). Specifically, the percent of intervals during which vocalizations occurred averaged 18% (range = 12% to 22%), canonical vocalizations averaged 17% (range = 3% to 15%), and single words averaged 10% (range = 0% to 20%). Charlie also began to use multiple words in an average of 1% (range = 0% to 3%) of the intervals. Regarding the communicative functions of these communicative forms, the percent of intervals during which Charlie initiated communication averaged 20% (range = 11% to 29%). The percent of intervals during which he responded to his caregiver's prompting strategies averaged 25% (range = 12% to 37%).

Heather

Heather’s baseline phase. During baseline phase sessions, Heather used only the communicative form of vocalization during an average of 3% (range = 0% to 17%) of the intervals, and canonical vocalizations during an average of 0% (range = 0% to 2%) of the intervals. She did not communicate using single words, or word combinations during baseline phase.

Her communicative forms were used for the communicative functions of initiating (average = 1%; range = 0% to 6%) communication with her caregiver and responding (average = 2%; range = 0% to 9%) to her caregiver.

Heather’s intervention phase. After Heather’s caregiver received instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), the percent of intervals during which Heather used communicative forms increased in level from an average of 4% during the baseline phase to an average of 12% (range = 8% to 53%) during the intervention phase. Specifically, Heather’s use vocalizations increased in level from an average of 3% (range = 0% to 17%) during the baseline phase to an
average of 11% (range = 2% to 19%) during the intervention phase. Her use of canonical vocalizations increased in level from an average of 0% (range = 0% to 2%) during the baseline phase to an average of 1% (range = 0% to 3%) during the intervention phase. She did not communicate using single words, or word combinations during baseline phase. Although there was a positive change in level between the baseline intervention phases, the percent of overlapping data points was 30%.

In addition, there was an increase in the percent of intervals during which Heather used communicative functions increased in level from an average of 3% (range = 0% to 14%) during the baseline phase to an average of 12% (range = 2% to 20%) during the intervention phase. Specifically, Heather’s use of responding increased from an average of 2% (range = 0% to 9%) in baseline phase to an average of 11% (range = 2% to 16%) in the intervention phase. The data revealed no change in the percent of intervals during which Heather initiated communication (average of 1%; range = 0% to 2%) between baseline and intervention phases. The change in average between the baseline and intervention phases was positive for communicative of functions, and the percent of overlapping data points was 30%.

**Heather’s maintenance phase.** During the maintenance phase, the percent of intervals during which Heather used communicative forms averaged 4% (range = 1% to 7%). Specifically, the percent of intervals during which vocalizations occurred averaged 4% (range = 1% to 7%). Canonical vocalizations, single words, and multiple words occurred in 0% of the intervals with all data points at 0.

Regarding the communicative functions of these communicative forms, the percent of intervals during which Heather initiated communication averaged 4% (range
= 1% to 7%). The percent of intervals during which she responded to her caregiver’s use of the intervention was 0%. These data reflect a deceleration in the percent of intervals during which Heather used communicative forms and communicative functions during shared book reading.

**Duration of Shared Book Reading Sessions**

For Hunter and his caregiver, the average amount of time engaged during shared book reading sessions in the baseline phase was 129 s (range = 97 s to 196 s). In the intervention phase, the average amount of time increased to 144 s (range = 56 s to 220 s). Between the intervention and maintenance phases, there was a decrease in the average amount of time of the shared reading sessions to 105 s with a range of 81 s to 156 s (see Figure 4-17).

During the baseline phase, the duration of Charlie’s shared book reading sessions with his caregiver averaged 208 s (range = 78 s to 273 s). This average decreased during the intervention phase to an average of 191 s (range = 40 s to 287 s). In the maintenance phase, the average duration of Charlie’s shared book reading sessions again decreased to an average of 169 s (ranged = 113 s to 237 s (see Figure 4-17). Thus, the average duration of Charlie’s shared book reading sessions decrease with each phase.

In contrast to Hunter and Charlie, the average duration of Heather’s shared book reading sessions increased across all phases. In baseline phase, the average duration was 122 s (range = 73 s to 122 s). This average duration increased during the intervention phase to 191 s (range = 147 s to 466 s), and during the maintenance phase to 433 s (range = 254 s to 619 s) (see Figure 4-17).
**Procedural Fidelity**

Procedural fidelity data were collected for the caregivers’ adherence to the video recording procedures and reading of the books provided during all phases of the study. Data were collected on the caregivers’ use of setting the environment procedure during each shared book reading session during the intervention and maintenance phases. In addition, procedural fidelity data were collected on the researcher’s instruction with the caregivers on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies). These procedural fidelity data also are reported in the following sections.

**Video Recording Procedures and Use of the Provided Books**

Caregivers were oriented to the digital video recorder and given instructions for positioning the recorder during shared book reading sessions such that the caregiver, their child, and the book were in view and the vocalizations of both participants were audible. Procedural fidelity data were collected on 100% of the baseline, intervention, and maintenance phase sessions (see Table 4-2). While each participant was audible in 100% of the video recorded sessions, the dyads adhered to the video recording procedures (i.e., the child, caregiver, and book were in view throughout the session) in 76% of the sessions. Specifically, the percent of video recorded sessions during which both participants and the book were in view was 89% of Hunter sessions, 64% for Charlie, and 77% for Heather. When the researcher reviewed video recordings where both participants and the book were not in the view, the procedures for video recording were reviewed with the caregiver. In each case, the child and the book always were visible. When there was a violation of the procedure, it was that the caregiver’s face was not in view, which did not impede the ability to code the caregiver’s use of the
strategies. The data also indicated that the dyads used the books provided by the researcher and only these books in 100% of the video recorded sessions.

Caregivers also were asked to complete the shared book reading data collection form weekly to document the frequency with which each dyad engaged in shared book reading. In addition, the caregivers were asked to document their impressions about both the video recorded shared book reading sessions and any additional shared book reading sessions that occurred between the dyad, but were not video recorded for the study (see Appendix J for the book reading data collection sheet). However, Hunter’s caregiver only submitted the form for 1 week of the study, Charlie’s caregiver did not submit the form, and Heather’s caregiver submitted the form for 6 weeks. Because the collection of these data was inconsistent across dyads, results could not be gleaned about the frequency with which the caregivers conducted shared book reading sessions with their children outside of the three shared book reading sessions required for the study.

**Instruction on the Caregiver-Implemented Intervention**

The researcher instructed each caregiver on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) using the caregiver instruction checklist in Appendix L. The instructional session with each caregiver took approximately 1 hr to complete. During that time, each caregiver role-played each prompting strategy until they demonstrated each strategy three times correctly in a 15 min shared book reading session with the caregiver. Two of the caregivers met the criteria in 15 trials within one 15 min shared book reading session of role-play with the researcher, while one of the caregivers met the criteria in 16 trials. None of the caregivers required a booster
instructional session on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) because for each caregiver prompting strategies occurred in at least 20% of the intervals during the intervention phase.

**Setting the Environment Procedure**

The instruction with the caregivers on the caregiver-implemented shared book reading intervention comprised instruction on setting the environment procedure before they conducted shared book reading sessions during the intervention phase. To set the environment, caregivers were instructed to keep the location of the shared book reading sessions consistent, to minimize distractions in the environment (e.g., other family members, radio, television, computer), and to position themselves and their children such that the child could see both the book and the caregiver’s face. Procedural fidelity data were collected on 100% of the shared book reading sessions in the intervention and maintenance phases. These data indicated the following. First, caregivers used the same location for shared book reading in 77% of the sessions. Second, distractions were minimized during 76% of the shared book reading sessions. Finally, the caregivers arranged themselves, the book, and their children such that the child could see their face and the book in 93% of the sessions. The sections below present these data for each dyad.

**Hunter and his caregiver**

During baseline phase, Hunter’s caregiver conducted all shared book reading sessions while sitting in a chair in her living room with Hunter on her lap with his back to her as she held the book in front of both of them. During the intervention phase, 70% of the sessions occurred in the living room with Hunter’s caregiver sitting either next to or
across from Hunter with the book between them facing Hunter. The other sessions occurred either in the kitchen or in the child’s bedroom. The caregiver, book, and child were arranged such that the child could see the caregiver and book in 100% of their shared book reading sessions.

**Charlie and his caregiver**

During baseline phase, 100% of the shared book reading sessions occurred in Charlie’s bedroom with Charlie and his caregiver sitting on the bed across from each other with the book between them facing the child. Following the caregiver instruction, Charlie’s caregiver set the environment by changing the location of their shared book reading sessions to the living room for 100% of the sessions during the intervention and maintenance phases. The positioning of the caregiver and child did not change between baseline and the intervention phases because the caregiver already had been positioning himself so that Charlie could see his caregiver's face and the book in 100% of their baseline sessions. This positioning was maintained across all three phases.

**Heather and her caregiver**

During baseline phase, 100% of the shared book reading sessions occurred in Heather’s living room with Heather sitting on her caregiver’s lap, with her head resting on her caregiver’s shoulder, and the caregiver holding the book in front of them. Due to Heather’s cerebral palsy, she had difficulty sitting up independently. To help Heather sit independently, she had a supported seating system, which the family used intermittently for other activities. The seating system provided trunk and head support for Heather while allowing her to move her arms freely. Following instruction with the caregiver on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), in
93% of the intervention and maintenance shared book reading sessions the caregiver set the environment by positioning Heather in the seating system so that she could see the book and her caregiver’s face during shared book reading, rather than Heather sitting on her caregiver’s lap where she could not see her caregiver’s face. The shared book reading sessions were conducted in the same location of the home (i.e., living room) during 75% of the intervention phase sessions. In the remaining 25% of the shared book reading sessions, the dyad was either in the kitchen or the child was sitting on the caregiver’s lap and not in the seating system. When these alternations in positioning were viewed by the researcher, the caregiver was reminded of the procedures for video recording and setting the environment during the weekly review of the intervention.

Social Validity
To establish social validity of the caregiver-implemented shared book reading intervention and outcomes, each caregiver completed a questionnaire that contained five Likert-type scale items, three yes/no questions, and three free response questions (see Appendix N). Responses to the questionnaire items were similar across caregivers.

In response to the Likert-type items, caregivers could select from values that ranged from 1 indicating not at all, to 4, indicating very. In response to the question regarding how difficult it was to learn the prompting strategies, caregivers unanimously indicated not at all (average = 1). The caregivers rated the usefulness of the instruction provided by the researcher prior to the intervention phase an average of 3.67 (range = 3 moderately to 4 very). Each caregiver responded that they were very likely (average = 4) to continue to use the prompting strategies during shared book reading following the
conclusion of the study. In addition, each caregiver indicated they were very likely (average = 4) to use the prompting strategies in other situations (i.e., bath time; mealtime) and very likely (average = 4) to recommend the prompting strategies to other caregivers.

In response to the yes/no questions, each caregiver indicated that they had seen a change in their child’s use of communicative behaviors during shared book reading. The caregivers also indicated that they spent more time engaged in shared book reading with their children during the study than before the study. Two of the caregivers each felt that one component of the prompting strategies (i.e., waiting for the child to respond) was more useful than the other components and the remaining caregiver did not feel that one was more useful than the other strategies.

For the free response questions, when asked to indicate any change they had seen in their children’s communication, each caregiver indicated that his/her child was communicating more during shared book reading. When asked if they felt one prompting strategy was more useful than the others were, one caregiver indicated that the most useful component was learning to wait for her child to interact. Another caregiver indicated that letting her child dictate the duration of the shared book reading session, and learning to interact during shared book reading instead of just reading to her child were most useful. One caregiver indicated that the intervention seemed more like a complete package than individual components.

**Summary**

Both within and across participants, conclusions can be drawn from the data. Overall, the percent of intervals during which the caregivers used the three initial and two follow-up prompting strategies increased from the baseline phase to the intervention
phase at levels that exceeded the baseline phase. This increase in level occurred across caregivers. In addition, caregivers generally maintained or slightly increased their use of the prompting strategies at 2 weeks and 4 weeks after the conclusion of the intervention phase. The caregivers used two of the initial prompting strategies (i.e., label-and-wait, request-and-wait) more than the third initial prompting strategy (i.e., tap-and-wait), and one of the follow-up prompting strategies (i.e., modeling) more than the other follow-up strategy (i.e., helping).

For the percent of intervals during which child participants used the four communicative forms and the two communicative functions, the changes across participants varied. Changes were evident in level between Hunter’s data for the baseline and intervention phases for both communicative forms and communicative functions, with an accelerating trend during the intervention phase. However, during the maintenance phase, there was a decelerating trend. The level of Charlie’s data indicated a slight increase in his use of the communicative forms and communicative functions, but the data had a decelerating trend in the intervention phase. He did maintain, however, his use of the communicative forms and communicative functions during the follow-up sessions conducted during the maintenance phase. Heather’s data reflected a positive change in level between the baseline and intervention phases for both communicative forms and communicative functions, but then a decelerating trend that continued during the follow-up sessions conducted during the maintenance phase.

There was an increase in the percent of intervals during which Hunter used canonical vocalizations between the baseline and intervention phases. The data for Charlie also showed an increase in the percent of intervals during which he used
canonical vocalizations and single words between the baseline and intervention phases. The data for both of these variables also showed an increase in level and an accelerating trend in the follow-up sessions for the use of these communicative forms for these two child participants.

The data for the duration of the shared book reading sessions showed an increase in level between the baseline and intervention phases for Hunter, but then a decrease in duration during the maintenance phase. For Charlie, there was a decrease in the level of the data on duration of shared book reading sessions across all phases. However, the duration of shared book reading sessions increased in level for Heather between the baseline and intervention phases, with an accelerating trend that continued during the maintenance phase.

Procedural fidelity data revealed that the video recording procedures, reading of the provided books, instruction with the caregivers, and the caregivers’ use of setting the environment procedure generally were conducted with integrity across the dyads. Finally, social validity data indicated that the caregivers found the use of the prompting strategies had a positive effect on their children’s communicative behaviors during shared book reading.
Table 4-1. Interobserver agreements (IOA)

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<th>Variable</th>
<th>Occurrence</th>
<th>Nonoccurrence</th>
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<td><strong>Caregiver Strategy Use</strong></td>
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<td></td>
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<td>Label-and-wait</td>
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<td>100% (98% - 100%)</td>
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<td>Tap-and-wait</td>
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<td>100% (99% - 100%)</td>
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<td>Request-and-wait</td>
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<td>99% (94% - 100%)</td>
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<td>Modeling</td>
<td>95% (75% - 100%)</td>
<td>100% (98% - 100%)</td>
</tr>
<tr>
<td>Helping</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Child Communicative Forms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocalization</td>
<td>94% (71% - 100%)</td>
<td>99% (90% - 100%)</td>
</tr>
<tr>
<td>Canonical vocalization</td>
<td>94% (67% - 100%)</td>
<td>99% (95% - 100%)</td>
</tr>
<tr>
<td>Single word utterance</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Multiword utterance</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Child Communicative Functions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiating</td>
<td>95% (70% - 100%)</td>
<td>99% (90% - 100%)</td>
</tr>
<tr>
<td>Responding</td>
<td>93% (50% - 100%)</td>
<td>99% (85% - 100%)</td>
</tr>
<tr>
<td>Procedure</td>
<td>Hunter’s caregiver</td>
<td>Charlie’s caregiver</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Use of the video recorder</td>
<td>89%</td>
<td>64%</td>
</tr>
<tr>
<td>Use of the books provided</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Use of setting the environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same location</td>
<td>70%</td>
<td>100%</td>
</tr>
<tr>
<td>Child could see book and caregiver’s face</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Figure 4-1. Caregivers' use of prompting strategies
Figure 4-2. Caregivers' use of initial prompting strategies
Figure 4-3. Caregivers' use of label-and-wait
Figure 4-4. Caregivers’ use of tap-and-wait
Figure 4-5. Caregivers’ use of request-and-wait
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Figure 4-8. Caregivers’ use of helping
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Figure 4-12. Child use of single word utterances
Figure 4-13. Child use of multiple word utterances
Figure 4-14. Child use of communicative functions
Figure 4-15. Child use of initiation
Figure 4-16. Child use of responding
Figure 4-17. Duration of shared book reading sessions
CHAPTER 5
DISCUSSION

The purpose of the present study was to determine: (a) if instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was functionally related to the caregivers’ use of initial and follow-up prompting strategies; and (b) if the caregivers’ use of the initial and follow-up prompting strategies resulted in corollary changes in their children’s use of communicative forms and functions during shared book reading sessions at home. Five research questions were posed in the present study: (a) Is instruction in a caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) functionally related to the caregivers’ use of initial and follow-up prompting strategies during shared book reading at home with their children age 18 to 34 months with significant developmental delays? (b) Does the caregivers’ use of the initial and follow-up prompting strategies during shared book reading at home result in corollary changes in their children’s use of communicative forms and functions with their caregivers during shared book reading sessions?; (c) Do caregivers maintain their use of initial and follow-up prompting strategies during shared book reading at home with their children at 2 weeks and 4 weeks following the termination of the intervention phase?; (d) Do children age 18 to 34 months with significant developmental delays maintain corollary changes in their use of communicative forms and functions with their caregivers during shared book reading sessions at home at 2 weeks and 4 weeks following the termination of the intervention phase?; and (e) Does the use of caregiver-implemented shared book reading intervention affect the duration of shared book reading sessions?
The purpose of this chapter is to discuss the results of the study. This chapter begins with an overview of the major findings of the study and possible explanations for the findings. The major findings and possible explanations are presented in relation to each of the research questions. Next, the implications of the findings for future research and practice are discussed. Finally, the chapter concludes with a discussion of the limitations of the study and a summary.

Overview of Findings

This section provides an overview of the major findings of the study and possible explanations for the findings. The five research questions addressed in the present study frame the discussion of the major findings and interpretations.

Research Question #1

The first research question (i.e., is instruction in a caregiver-implemented shared book reading intervention functionally related to the caregivers’ use of initial and follow-up prompting strategies with their children age 18 to 34 months with significant developmental delays?) addressed the effectiveness of the instruction with the caregivers implemented by the researcher to increase the caregivers’ use of the prompting strategies during shared book reading sessions with their children. The data indicated that the instruction (i.e., 1-hr instructional session and brief weekly review) in caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was effective for increasing the caregivers’ use of initial and follow-up prompting strategies during shared book reading with their children.

The ability to infer that the changes observed in a dependent variable (i.e., use of the initial and follow-up prompting strategies) were facilitated by the introduction of an
independent variable (i.e., instruction with the caregivers) is dictated by the immediacy of the changes following the introduction of an independent variable (Kazdin, 1982). For each caregiver in the present study, the effectiveness of the instruction in the caregiver-implemented shared book reading intervention was demonstrated by the immediate increase in the level of the data for the combined use of the five prompting strategies following instruction with the caregivers. This finding is consistent with previous research on caregiver-implemented interventions which shows that when caregivers were taught to use strategies focused on increasing children's communication of young children with developmental delays, the caregivers' use of these strategies increased during the intervention phase in the context of play at home (Rocha et al., 2007; Woods et al., 2004). The present study extends the research on instruction with caregivers on caregiver-implemented intervention with young children with developmental delays by examining the effects of the instruction on the caregivers’ use of the intervention in the context of shared book reading at home. For the present study, the instruction with caregivers consisted of discussing with the caregivers the importance of shared book reading and communication, defining each of the strategies, modeling the strategies, caregivers role-playing the strategies, and reviewing the strategies weekly with the caregivers.

Regarding the instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), a few points should be highlighted. First, data on the fidelity of the caregiver instruction indicated that the caregivers learned the strategies with relative ease, given that two out of the three caregivers were able to implement the prompting
strategies correctly with the researcher during the instructional session in the fewest amount (i.e., 3 consecutive prompts implemented correctly) of trials per strategy during the instructional session with the researcher. Second, after the caregivers received instruction on the shared book reading intervention, none of the caregivers required a booster instructional session on the prompting strategies because in each of their video recorded shared book reading sessions the caregivers used prompting strategies in at least 20% of the intervals during the intervention phase. Finally, during the intervention phase, the researcher met weekly with each caregiver to verbally review the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies and follow-up prompting strategies). That is, the researcher verbally defined setting the environment procedure and each of the five prompting strategies, answered any questions about the strategies, and encouraged caregivers to continue to use the strategies during shared book reading sessions (Woods et al., 2004). No further support (i.e., coaching while the caregivers used the strategies with their children or modeling of the strategies with their child) was provided. Given these points, the data suggest that the format, frequency, and intensity of the instruction with the caregivers provided during the instructional session and throughout the intervention phase were sufficient to change the caregivers’ behaviors within the context of shared book reading sessions with their children at home.

In other studies designed to increase communication in children with disabilities in the context of shared book reading, the format, frequency, and intensity of instructional sessions with caregivers ranged from one 2-hour instructional session to three 1-hour instructional sessions with and without weekly reviews of the interventions (Binger et al.,
2008; Crowe et al., 2004; Dale et al., 1996; Koppenhaver et al., 2001; Light et al., 1994). Of the studies reviewed that focused on increasing communication for children with disabilities in the context of shared book reading, only Saint-Laurent et al. (1998) reported weekly home visits to review the strategies contained in the intervention. Compared with these studies, the frequency and intensity of the instructional session for the present study (i.e., one 1-hour instructional session plus weekly visits to review the strategies) was relatively efficient and effective in its implementation.

Furthermore, the format for delivering the instruction with the caregivers varied across previous studies. For example, in 40 min instructional sessions with caregivers, Crowe et al. (2004) began sessions with the researcher providing a description of each step of the strategy, followed by a reading probe where the researcher video recorded the caregiver and child reading a story together. Next, the researcher and caregiver reviewed the video recorded shared book reading session and identified positive aspects of the interaction. Finally, the researcher coached the caregivers when engaged in a shared book reading session with their children. In another study, Rocha et al. (2007) used a 3-step instructional procedure, with the researchers (a) providing the caregivers a handout describing the strategies, (b) modeling the use of those strategies with the child participant, and (c) coaching the caregivers as they implemented each strategy with their children.

For the present study, instruction in the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) occurred during a 1-hour session with the caregivers comprised of four steps similar to those used in early intervention research (Rocha et
al., 2007; Woods et al., 2004). First, the researcher discussed with the caregivers the benefits of shared book reading and the importance of communication for their child. Second, the researcher defined and explained how to set the environment for shared book reading, then defined and modeled the use of each of the five prompting strategies (Rocha et al., 2007). In addition, during the instructional session, the researcher described for the caregivers how to respond when their children’s responses were correct. A handout with an explanation of each component of the shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was provided to each caregiver as a referent. During the instructional sessions, each caregiver had an opportunity to ask questions about and make comments to verify their understanding of the setting the environment procedure and the prompting strategies. Third, the researcher modeled the use of setting the environment procedure and the five prompting strategies during a shared book reading session with the caregiver. Fourth, the caregiver demonstrated his/her understanding of the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial and follow-up prompting strategies) by role-playing a shared book reading session with the researcher. The researcher provided corrective feedback to the caregiver throughout the session. This was terminated when the caregiver implemented each of the strategies 3 times independently with 100% accuracy during a 15 min role-play session (Woods et al., 2004). During the intervention phase, the researcher met weekly with each caregiver to verbally review the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial and follow-up prompting strategies). In the
Woods et al. (2004) study, the caregivers reviewed videotaped sessions of other dyads during play sessions then modeled the use of targeted strategies with the child participant. In addition, the researchers made weekly home visits to gather information about family activities, review the protocol for the home visit, observe, and collect data on the caregiver implementation of the strategies, and plan for the next home visit.

There are clear differences in the format, frequency, and intensity of the instructional sessions used with the caregivers across studies, with some more efficient and, perhaps, more effective than others. It is possible that the effect of the present study could have been greater had the researcher modeled the use of the strategies with the child participants. However, given the unfamiliarity of the researcher to the child participants in the present study, and the unpredictability of the reactions of young children to new people, a decision was made not to include modeling with the child as a part of the instructional session with the caregivers.

Regarding the effectiveness of the instruction with the caregivers, the data indicated that the instruction in caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was effective for increasing the caregivers’ use of the initial and follow-up prompting strategies during shared book reading with their children. While the effectiveness of the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) was based on the overall use of the initial and follow-up prompting strategies combined, further analysis of the data revealed that the caregivers differed in their use of specific prompting strategies. For example, each of the caregivers used the initial
prompting strategies more than they used the follow-up strategies. This differentiated use is logical and was expected because a follow-up strategy could occur only after an initial strategy had occurred and there are two reasons why a caregiver might not use a follow-up strategy after an initial prompting strategy. First, the child participant might have responded to the initial strategy correctly, so the caregivers could have provided social praise or an affirmation, instead of a follow-up prompting strategy. Second, even if the child did not respond to the initial prompt, the caregiver might not have used a follow-up strategy; rather the caregiver might have ignored the response or lack of response and proceeded to a new opportunity to use an initial prompt.

Further analysis of the data also revealed that the caregivers of two of the children (i.e., Hunter and Charlie) used one of the initial prompting strategies (i.e., label-and-wait) more than the other two initial prompting strategies (i.e., request-and-wait, tap-and-wait). In contrast, the caregiver for one child (i.e., Heather) used one of the other initial prompting strategies (i.e., request-and-wait) more than the other two initial prompting strategies (i.e., label-and-wait, tap-and-wait). When considering these findings together, it becomes evident that none of the caregivers used the initial prompting strategy of tap-and-wait more than the other two strategies. In fact, for each caregiver, the use of tap-and-wait increased slightly immediately after they received instruction on the strategies, but faded after a few sessions. In addition, after receiving instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies), the caregivers used one of the two follow-up prompting strategies (i.e., modeling) more than the other follow-up prompting strategy (i.e., helping). It is possible that each
caregiver selected one prompting strategy over the other prompting strategies based on their child’s joint attention skills. This possibility is supported by Girolametto (1988), who hypothesized that caregivers might select some intervention strategies over others in response to their children’s level of development.

In the present study, selection of the prompting strategies was based on previous research that suggests children with developmental delays often have deficits in joint attention (Paparella & Kasari, 2004). Previous research also suggests that children are more likely to increase their communication when caregivers talk about items to which the child and caregiver are jointly focused (Paparella & Kasari, 2004). The intent of the initial and follow-up prompting strategies is to shift the child’s attention to a location to which the caregiver is focused (Paparella & Kasari, 2004; Rocha et al., 2007). In the present study, however, the child participants’ performances on the Unstructured Joint Attention Assessment (Loveland & Landry, 1986) did not suggest a deficit in joint attention. Therefore, it is possible that the caregivers elected not to use specific prompting strategies (i.e., tap-and-wait, helping) because their children already were focused on a location in the book with the caregivers and this type of prompt was not necessary to shift their children’s attention. In addition, one follow-up prompting strategy (i.e., helping) is more invasive than the other strategies, which also might explain the caregivers’ limited use of that strategy. One of the caregivers even articulated his reluctance to use the follow-up prompting strategy of helping during the caregiver instructional session. This was not viewed as a threat to the internal validity of the study because the follow-up strategies were described to the caregivers as optional and not
compulsory strategies to use if their children did not respond to an initial prompting strategy.

**Research Question #2**

The second research question (i.e., Does the caregivers' use of the initial and follow-up prompting strategies during shared book reading at home result in corollary changes in their children's use of communicative forms and functions with their caregivers during shared book reading sessions?) addresses the children's use of communicative forms and functions during shared book reading sessions. The results indicate that, corresponding to the increase in the percent of intervals during which their caregivers used the initial and follow-up prompting strategies after receiving instruction, there were changes in the percent of intervals during which each of the three child participants used communicative forms and communicative functions. This finding is consistent with previous research which found that when caregivers implemented an intervention in their home during shared book reading sessions with their preschool-age children who had disabilities there was an increase in their children’s use of communicative forms and functions (Binger et al., 2008; Crowe et al., 2004; Dale et al., 1996; Koppenhaver et al., 2001; Light et al., 1994).

In the present study, two of the three child participants increased the variety of communicative forms they used to communicate with their caregivers. Specifically, Hunter used only vocalizations during the baseline phase, but the variety of communicative forms he used increased during the intervention phase to include both vocalizations and canonical vocalizations, and during one session he used a single word. Hunter continued to use these communicative forms during follow-up sessions in the maintenance phase. While the overall data for percent of intervals during which
Charlie used communicative forms and communicative functions decreased between the baseline and intervention phases, the variety of the communicative forms he used increased from vocalizations and canonical vocalizations in the baseline phase to vocalizations, canonical vocalizations, single words, and multiple words during the intervention phase. Similar to Hunter, Heather also showed an increase in the average percent of intervals during which she used communicative forms between the baseline and the intervention phases. But the communicative forms she used (i.e., vocalizations; canonical vocalizations) were consistent across baseline and intervention phases.

Based on the Battelle Developmental Inventory (BDI-2; Newborg, 2005), the expressive communication age equivalencies for the child participants were 10, 14, and 11 months, which, according to the literature, is about the age that children who are typically developing begin to use canonical vocalizations such as “mama” and “dada” (deVilliers & deVilliers, 1979). Therefore, it is possible that the changes in the child participants’ use of communicative forms were reflective of their level of development in their expressive communication and might not have been related to the intervention. It also is possible that more data collected during the intervention phase might have shown more positive shifts in the child participants’ use of communication forms and functions. According to Hargrove, Holmberg, and Zeigler (1986), when children are in treatment, their progress toward communication might not be immediately evident; thus, there is a “lag effect” between treatment and the use of communicative forms (i.e., speech).

Regarding the communicative functions of their communicative forms, between the baseline and intervention phases there was a change in the percent of intervals during
which all three of the child participants used communicative functions of initiation and responding after their caregivers received instruction on the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies). For Hunter, the percent of intervals during which he used the communicative function of initiating and responding increased between the baseline and intervention phases. One explanation for this increase could be that repeated readings of the same books led to Hunter’s increased initiation of comments about the pictures in those books as suggested in other studies that examined the effectiveness of caregiver-implementation of interventions during shared book reading (Crowe et al., 2005). The results for Charlie, however, showed that the percent of intervals during which he used the communicative function of initiating decreased between the baseline and intervention phases. Observations during the baseline phase showed that Charlie’s caregiver made few demands of Charlie thus creating few opportunities for his child to respond. Increasing the caregiver’s use of prompting strategies appears to have contributed to the caregiver’s responsiveness to his child’s use of initiating creating a more balanced shared book reading experience (Crowe et al., 2004). For Heather, the percent of intervals during which she responded to her caregiver’s communication was more than the percent of intervals during which she initiated communication during all phases of the study. Observations during her baseline phase sessions also showed that Heather sat passively in her caregiver’s lap while her caregiver read the book.

This increase in the use of responding was expected because the strategies taught to the caregivers were designed to increase their use of initial prompts to which
their children could respond during shared book reading. Crowe et al. (2004) suggested that when a child uses responding more than initiating to communicate during shared book reading, the child becomes a passive listener because the adult participant is directing the interaction. However, in that study, the child participants were older and identified as having language impairments. For the child participants in the present study, who were identified with significant developmental delays, an increase in their use of the communicative function of responding was an indicator that they became active participants in the shared book reading sessions rather than remaining passive listeners in the shared book reading sessions.

Rescorla and Mirak (1997) suggested that by the time children who are typically developing are 9 months old, they use pre-symbolic forms of communication (i.e., vocalizations, gestures) for the purpose of initiating and responding. Based on the Unstructured Joint Attention Assessment (Loveland & Landry, 1986) and informal observations made by the researcher during visits to the homes, each of the child participants demonstrated the use of initiating and responding prior to the baseline phase. The child participants’ increased use of responding when their caregivers used the prompting strategies supports findings from previous research conducted in the context of play sessions (Rocha et al., 2007) that also demonstrated positive effects of caregiver-implemented intervention on the use of communication forms and functions by young children with disabilities. The present study extends this research by investigating caregiver-implemented intervention in the context of shared book reading sessions.
Research Question #3

The third research question (i.e., Do caregivers maintain their use of initial and follow-up prompting strategies during shared book reading at home with their children at 2 weeks and 4 weeks following the termination of the intervention phase?) addresses the caregivers’ maintenance of the prompting strategies during follow-up shared book reading sessions. The results indicate that each of the caregivers generally maintained their use of the prompting strategies during the follow-up sessions collected at 2 weeks and 4 weeks after the last intervention session. In general, the caregiver’s use of the prompting strategies in the maintenance phase followed similar patterns of use observed during the intervention phases. That is, the caregivers of two of the children (i.e., Hunter and Charlie) used one of the initial prompting strategies (i.e., label-and-wait) more than the other two initial prompting strategies (i.e., request-and-wait, tap-and-wait), and the caregiver for one child (i.e., Heather) used one of the other initial prompting strategies (i.e., request-and-wait) more than the other two initial prompting strategies (i.e., label-and-wait, tap-and-wait). In addition, all three caregivers used one of the two follow-up prompting strategies (i.e., modeling) more than the other follow-up prompting strategy (i.e., helping). For one follow-up session, however, Hunter’s caregiver used follow-up strategies more than initial prompting strategies.

One possible explanation for his caregiver’s use of follow-up strategies more than initial prompting strategies is that after the caregiver used an initial prompting strategy (e.g., label-and-wait), she modeled the response more than once after her child responded to the initial prompting strategy. These findings support those of other studies that investigated the maintenance of caregiver-implemented intervention in the context of shared book reading with children with disabilities. For example, Binger et al.
(2008) and Crowe et al. (2004) both conducted follow-up sessions and found that caregivers either maintained or increased their use of the strategies they were taught to use during shared book reading sessions.

**Research Question #4**

The fourth research question (i.e., Do children age 18 to 34 months with significant developmental delays maintain corollary changes in their use of communicative forms and functions with their caregivers during shared book reading sessions at home at 2 weeks and 4 weeks following the termination of the intervention phase?) addressed the child participants’ maintenance of the use of the communicative forms and functions. Maintenance was limited to two of the three child participants (i.e., Hunter and Charlie) who showed similar use of communicative forms and functions from intervention to maintenance phases. The literature suggests that children who are typically developing assume a more active role in shared book reading as books become more familiar (Koppenhaver et al., 2001; Light et al., 1994) and that repeated readings of the same book result in increased use of communicative behaviors (Snow & Ninio, 1986). However, inconsistent with the literature on young children who are typically developing is that Heather’s use of communicative forms and functions decreased during the maintenance phase although her caregiver continued to use the books provided for the shared book reading sessions; that is, books with which Heather should have been familiar. One explanation could be that similar to other studies that investigated the use of communication forms and functions by children with speech and physical impairments (i.e., cerebral palsy, Rett syndrome), the lack of access to alternate forms of communication (i.e., augmentative/alternative communication systems) might have limited her participation in shared book reading with her caregiver (Light et al., 1994).
While Heather used the communicative forms of vocalizations and canonical vocalizations she did not increase her use of more sophisticated or symbolic forms of communication (i.e., single word utterances; multiple word utterances) during the intervention or maintenance phases, as did the other child participants. Koppenhaver et al. (2001) found that girls with Rett syndrome increased their use of communication forms and functions during shared book reading when they were given access to alternate forms of communication (i.e., Picture Communication Symbols; voice output communication aids). The results of the present study certainly are not sufficient to recommend alternate or augmented forms of communication for Heather. The lack of increase in the variety of her communicative forms could be one indicator for the need to explore the possibility of her need for alternate or augmented forms of communication, given her physical limitations and the therapy services she has received since her diagnosis shortly after birth.

**Research Question #5**

The final research question (i.e., Does the use of caregiver-implemented shared book reading intervention affect the duration of shared book reading sessions?) addresses the duration of the shared book reading sessions. The duration was calculated for each session across all phases. Two of the three dyads (i.e., Hunter; Heather) showed an increase between baseline and intervention phases in the average amount of time spent during each session. During the maintenance phase, two of the three dyads (i.e., Hunter and Charlie) showed a decrease from the intervention phase in the average amount of time spent during each session. Specifically, the duration of Hunter and his caregiver’s sessions increased between baseline and intervention phases but decreased in the maintenance phase. For Charlie and his caregiver, there
was a decrease in the duration of shared book reading sessions both between the baseline and intervention phases, and between the intervention and maintenance phases. Heather and her caregiver showed an increase in the duration of shared book reading sessions across the intervention and maintenance phases. One explanation for the increases in duration observed in the intervention phases could have been the caregiver use of the prompting strategies. Because the caregivers were creating opportunities for their children to communicate, it is reasonable that the duration of the sessions could have increased. In the case of Charlie and his caregiver, one possible explanation for their decrease in the average duration of shared book reading is that for the ninth session of the intervention phase, Charlie’s caregiver reported that he was not feeling well which might have limited the time spent during their shared book reading session. An alternate explanation could be that the dyads might spend more time engaged with preferred books than with books that were less preferred.

One indication of book preference could be the frequency with which certain books were read during the shared book reading sessions. The books that were read most frequently by the dyads during the video recorded shared book reading sessions were *Goodnight Moon* for Hunter and *Quiet Loud* for Charlie and Heather. No difference in the mean duration for Hunter between the book he read most frequently and the other books he read. For Charlie and Heather, however, the mean duration for the sessions in which they read their preferred book was greater than for sessions in which they read the other books.

For Heather and her caregiver, the magnitude of the increase in duration between the baseline and intervention phases was greater than the magnitude observed for the
other dyads. Heather’s caregiver often waited for Heather to respond to initial prompts more than 3 s minimum for the initial prompting. It is possible that the 3 s wait-time required before the caregiver’s use of a follow-up prompt was not sufficient for Heather to respond and, therefore her caregiver waited longer than 3 s to allow Heather time to respond. This longer wait time often resulted in a response from Heather. Heather’s caregiver commented to the researcher on a number of occasions that because she was positioned such that she could see Heather’s face during the sessions, she had become aware of lip and jaw movements Heather made following the initial prompts. The mother interpreted these movements as attempts to communicate and then waited for her daughter to vocalize. Heather’s caregiver also commented that she allowed Heather to dictate when to turn the page in the book rather than turning the page herself, which could have increased the duration of the shared book reading sessions. Overall, the duration of the sessions ranged from 40 s to 619 s, which might seem relatively short, however, for children of this developmental age, the duration would be appropriate. In a recent review of the literature on caregiver-implemented shared book reading, the duration of the shared book reading sessions ranged from 2 to 15 min (Trivett, Dunst, & Gorman, 2010).

The caregivers were provided with a data collection sheet on which to document the amount of time spent in and frequency of their shared book reading sessions each week, both video recorded sessions for the study and other shared book reading sessions not for the study. However, none of the caregivers completed these data sheets consistently. One explanation could be that the caregivers found this request too demanding. This might be helpful information for other researchers, when considering
methods for collecting this type of data. It also is possible that the caregivers might had
difficulty collecting this data given the demands of family and work life on many
caregivers.

In summary, the instruction with the caregivers on caregiver-implemented shared
book reading intervention was effective for increasing the caregivers’ use of the
prompting strategies during shared book reading sessions at home and the caregivers
maintained their use of the prompting strategies during follow-up sessions. In addition,
the format, frequency, and intensity of the instructional sessions appeared to be
sufficient for changing the caregivers’ behaviors during the intervention phase of the
study. There was differentiated use of the prompting strategies across the caregivers,
with some prompting strategies used more frequently than others across phases.

There also was a positive shift for two of the three child participants in their use of
communicative forms and communicative functions that corresponded with the increase
in their caregivers’ use the prompting strategies after receiving instruction. These shifts
were observed in the increased variety of communicative forms used and the increase
in the use of the communicative function of responding during the intervention phases.
Maintenance was limited to two of the three child participants (i.e., Hunter and Charlie)
who showed similar use of communicative forms and functions from intervention to
maintenance phases. Duration of the shared book reading sessions varied across
participating dyads and across phases.

**Implications for Future Research**

Positive effects of the instruction for caregivers in caregiver-implemented shared
book reading intervention, and of the caregiver’s use of initial and follow-up prompting
strategies on the use of communicative forms and functions by their children ages 18 to
34 months identified as having significant developmental delays were found in the present study. The findings from the present study lead to implications for future research, which are discussed in this section.

First, one of the limitations of this and previous studies that have employed the context of early literacy experiences for young children with disabilities is the small number of participants who have had functional ability limitations in communication and other domains across studies. There is a need, therefore, for additional research with this population across early literacy experiences including, but not limited to, shared book reading contexts. Future research should extend the outcomes from the present study to include additional participants and to other young children with functional ability limitations in communication and other domains.

Second, researchers should examine the format, frequency, and intensity of instruction aimed at teaching caregivers to use the caregiver-implemented shared book reading intervention (i.e., setting the environment procedure, initial prompting strategies, follow-up prompting strategies) in various contexts in the home. To date, researchers have used a variety of formats, as well as variations in the frequency and intensity of instruction to instruct caregivers to implement interventions with their children. It is reasonable that the format, frequency, and intensity of instruction might vary depending on the desired child outcomes. However, research on format for providing instruction to caregivers, as well as the frequency and intensity of that instruction, and on interventions that target specific child outcomes might be helpful to the field, particularly for early interventionists who provide services in the home and who work with caregivers.
Third, future research should address the generalization of the use of initial and follow-up prompting strategies to other natural contexts. Woods et al. (2004) found that caregivers could implement strategies in the context of play, and could generalize the use of those strategies to other daily routines (i.e., mealtime, bathtime). Identifying the format, frequency, and intensity of instruction that leads to caregivers maintaining and generalizing the use of interventions is central to helping caregivers implement interventions with their children across contexts and activities.

Finally, future research also should examine the impact of the individual strategies that comprise the interventions focused on young children’s communicative forms and functions during shared book reading. For example, in the present study, one way of examining different components of the intervention could have been to first examine the effects of the caregivers’ use of setting the environment procedure on the children’s use of communicative forms and functions and then provide instruction for the caregivers on the prompting strategies. This type of component analysis also could have provided further information about the impact of setting the environment procedure on the children’s use of communicative forms and functions during shared book reading. The identification of specific strategies used across interventions implemented during early literacy experiences could contribute to the extant research on practices that are effective for young children with significant developmental delays.

Implications for Practice

The present study has several implications for practice. It expands the field’s knowledge about the functional relationship between instruction on caregiver-implemented shared book reading intervention and caregivers’ use of prompting strategies during shared book reading sessions and corollary changes in the use of
communicative forms and functions used by their children 18 to 34 months old who have significant developmental delays. Previous studies have shown that caregivers were instructed with a variety of instructional formats, frequencies, and intensities (i.e., one 2-hour instructional session or three 1-hour instructional sessions plus weekly home visits with coaching; Binger et al., 2008; Crowe et al., 2004; Dale et al., 1996; Koppenhaver et al., 2001; Light et al., 1994). Early interventionists should be encouraged to instruct caregivers to implement interventions that have been shown to be effective and designed to facilitate specific child outcomes. The present study has implications for practice because it provides additional evidence supporting caregiver-implemented intervention in the natural environment (i.e., home) with their young children with significant developmental delays.

Early interventionists and clinicians should encourage caregivers of young children with significant developmental delay to read with their children, and should instruct the caregivers on strategies for facilitating their children’s communication during shared book reading (Koppenhaver et al., 2001). The present study provides evidence that when the caregivers were instructed on a shared book reading intervention, and then implemented the intervention with their young children with significant developmental delays, the result was in corollary changes in the use of communicative forms and functions by their children. Previous researchers have shown that preschool children with disabilities used utterances that were more intelligible, complex, and frequent during shared book reading after their caregivers received instruction on interventions focused on increasing children’s communicative behaviors (Dale et al., 1996; Davie & Kemp, 2002). Researchers also have shown that the use of caregiver-implemented
Intervention has resulted in increased use of communication by their young children with developmental delays in other contexts, such as play and daily routines in the home (Woods et al., 2004). However, researchers have not demonstrated these effects in the context of shared book reading for young children with disabilities under the age of 3 years. The present study provided some evidence that the use of prompting strategies in the context of shared book reading positively affects the use of communicative forms and functions by children who have significant developmental delays.

Finally, children’s use of communication has been linked to the development of emergent literacy (Blischak, 1995; Erickson & Koppenhaver, 1997; Koppenhaver et al., 1991). The present study has practical implications for practice because it suggests that the context of shared book reading is a viable context to facilitate communication with children with significant developmental delays who are 18 to 34 months old. The study also has implications for practice because it demonstrates for caregivers, early interventionists, and speech-language pathologists the interrelatedness of communication, early literacy experiences, and the implementation of interventions by caregivers in the natural environment for young children with significant developmental delays.

Limitations

There were a few limitations in the present study. First, as in many studies that use single-subject experimental research methods, the small sample of participants is a threat to external validity (Kazdin, 1982). In the present study, the child participants were diagnosed with significant developmental delays primarily in the area of communication. It is not known if the results from the present study could be generalized to children with other developmental delays or differentially diagnosed
disabilities (e.g., Down syndrome, autism spectrum disorders). Because the child participants were children age 18 to 34 months old who had limited communication skills, it is not known if the findings could be generalized to children who are younger or older, or to children with more or less communication skills.

A second limitation of the study is related to the data collection for the caregivers’ use of the prompting strategies. Data were collected on the caregivers’ use of the prompting strategies across all three phase of the study. Variability in these data was observed during both the baseline and intervention phases of the study. In studies that use multiple baseline research designs, the intervention usually is not applied until baseline stability has been obtained; however, when the levels are low, leniency toward variability is permitted (Kazdin, 1982). The levels of the data collected during the baseline phase for each caregiver were low. One possible explanation for the variability in the data could be the variation in the books that were used during the study. While each of the books met the selection criteria, there were differences in the books, which might have contributed to variations in the caregivers’ use of initial and follow-up prompting strategies. For example, the book *Pat the Bunny* contains manipulative features (i.e., flaps) that might have resulted in the caregivers using more prompting strategies than they might have used with a book that did not have manipulative features. The data for two of the three caregivers demonstrated a very slight accelerating trend during the baseline phase of the study; however, the data point collected just prior to the intervention phase showed a decelerating trend. That is, the data reflected a “contratherapeutic trend immediately prior to introduction of the intervention” (Gast, 2010, p. 285). These two factors restrict interpretation of the results
and potential for demonstration of experimental control. Across participants, increases in the caregivers’ use of the prompting strategies were observed to be consistent following the instruction with the caregiver. This was evidenced for each caregiver with the percent of non-overlapping data points being 100%, which generally indicates that the intervention had an impact on the targeted behaviors (Gast, 2010). In studies that use multiple baseline research designs, researchers must balance the impact of deciding to prolong the baseline phase, with the impact of delaying intervention for the other participants in the study who would be continuing in the baseline phase.

Third, the frequency with which each dyad participated in shared book reading sessions outside of the study was not known. It is possible that there were differences in the frequency with which each dyad participated in shared book reading sessions that were not part of the study. This might have affected the caregivers’ use of the prompting strategies or the child participants’ use of the communicative forms and functions. Caregivers using the prompting strategies several times daily might have a different result from those using the strategies only 3 times per week during shared book reading sessions. The caregivers’ responses to the Stony Brook Family Reading Survey indicated that the dyads engaged in high levels of home literacy activities prior to the initiation of the study, which could be interpreted as the dyads engaging in similar frequencies of shared book reading sessions prior to the study. However, this cannot be verified with the current set of information.

Fourth, the fidelity with which the caregivers complied with the procedures for video recording, as well as conducting the shared book reading sessions in a consistent location was not consistent across caregivers. This inconsistency might have
threatened the outcome of the study. Specifically, video recorded shared book reading sessions of Charlie and his caregiver often contained noises from household media such as the television and radio being used in close enough proximity to be heard on the video recording. These might have influenced the fidelity with which the dyad conducted the shared book reading sessions.

Fifth, while the Hollingshead Four-Factor Index (1975) provided relevant information to describe the participants, it is a dated tool, and the antiquated social status descriptions do not reflect the variety of occupations that exist today. In addition, the process for calculating the index does not consider the variety of household partnerships that might exist. For example, the calculations do not include an option for caregivers who are not married but are cohabitating. Therefore, the Index should be interpreted with caution.

Sixth, although the researcher followed procedures for conducting the instructional sessions with caregivers, differences might have existed in the researcher’s behavior during the instructional sessions with the caregivers, and these differences might have influenced the caregivers’ ability to learn the shared book reading intervention (Rocha et al., 2007). For example, during the instruction, one of the caregivers requested that the researcher model the use of the prompting strategies with the child participant. It was explained that the researcher was to model with the caregiver, not with the child during the instructional session. The rationale for not modeling with the child was two-fold. First, the child participants lacked familiarity with the researcher and this could have affected their use of communicative forms and functions during shared book reading with the researcher. Second, the researcher sought to determine whether the caregivers
could learn to use the prompting strategies without the researcher modeling the prompting strategies with the child.

Finally, the study lasted approximately 18 weeks and during that time the child participants were maturing and receiving early intervention services. Despite the use of a design that attempts to control for such factors (i.e., maturation; type, frequency, and quality of early intervention services received during the study) and the evidence of experimental control, these factors might have had a positive effect on the child participants’ use of communicative forms and functions. Thus, the results should be interpreted with caution.

Summary

Previous researchers have examined the effect of instructing caregivers in a caregiver-implemented shared book reading intervention on the caregivers’ use of initial and follow-up prompting strategies and corollary changes in their children’s use of communicative behaviors (Binger et al., 2008; Crowe et al., 2004; Dale et al., 1996; Koppenhaver et al., 2001; Light et al., 1994). The present study extended the outcomes of those previous studies. In keeping with those studies, the present study found that the instructional components used were functionally related to the caregivers’ use of prompting strategies with their young children with significant developmental delays during shared book reading sessions. The three caregivers increased their use of initial and follow-up prompting strategies during shared book reading with their children. The caregivers generally maintained their use of the prompting strategies during follow-up sessions. In addition, two of the three child participants showed corollary changes in their use of communicative forms and functions.
Practical implications can be drawn from the present study. The present study contributes to both research and practice because it adds to the existing research on instruction for caregivers on caregiver-implemented shared book reading interventions by demonstrating that when the researcher used the instructional components with the caregivers it resulted in the caregivers’ use of the initial and follow-up prompting strategies. In addition, the study contributes to both research and practice because it adds to the existing research on the effect of caregiver use of the initial and follow-up prompting strategies on their children’s use of communicative forms and functions were observed. In conclusion, instruction for caregivers on a caregiver-implemented shared book reading intervention led to increases in the caregivers’ use of initial and follow-up prompting strategies and in general resulted in corollary changes in their children’s use of communication behaviors.
Protocol title: The Effects of Caregiver-Implemented Shared Book Reading Intervention on the communicative behaviors of Young Children with Significant Developmental Delays

Please read this informed consent document carefully before you agree to participate or allow your child to participate in this study.

Purpose of the research study: This research study is to see if children communicate more when their caregivers use intervention and prompting strategies while reading a book with their child. These strategies are ways that you can read to your child and talk with your child while reading a book. We are looking at the use of these strategies with young children with developmental delays.

What you and your child will be asked to do during the study: You and your child will be asked to take part in shared book reading activities. We will videotape your reading activity. You will learn specific strategies to use when reading with your child. The strategies will be taught by the researcher in your home between the phases of the study (see below).

(a) Phase 1: In the first phase, you will be asked to fill out a survey about reading to your child at home, your job, and your child’s abilities. In addition, the researcher will observe your child to see how he/she plays. Then, you will videotape yourself and your child reading books and playing. The researcher will loan you a camera and give you books to read with your child.

(b) Phase 2: In the second phase, you will learn from the researcher about specific strategies to use when reading with your child. We will show you how to use the strategies and “coach” you (provide support) while you try out the strategies. Like in phase 1, you will videotape yourself and your child reading books and playing.

(c) Phase 3: In the third phase of this project, again you will videotape yourself and your child reading books and playing. However, this phase will take place at 2 weeks and 4 weeks after phase 2 is completed.

Time required: You will videotape yourself reading with your child up to four times each week for up to 8 weeks. Follow-up observations will occur at 2-weeks and 4-weeks after the last observation in phase 2. The initial instructional session will take about one
hour. The weekly coaching sessions will take about 30 minutes. The total amount of time for the project will be about 2 months.

**Confidentiality:** The shared book reading observations will be videotaped so we can look at your child’s communicative behaviors and review them several times to be sure we can see them consistently across reviewers. In addition to the researcher, another rater will review the videotapes so we can see whether they see the same communicative behaviors at the same time. Neither your name nor your child’s name will be used on the videotapes or the coding sheets or in the publication or presentation of data from this project. Data will be kept confidential to the extent provided by the law. The videotapes will be destroyed 1 year after the study is over.

**Risks and Benefits:** There are no foreseeable risks associated with participating in this study. Possible benefits may include finding new ways to help your child communicate and participate in shared book reading. If your child does not want to read the book because he or she is tired or wants to do something else, you can stop reading and try again another time.

**Compensation:** Books used during the project will be given to you and your child to keep at the end of phase three. The results of the study will be shared with you at the end of the project.

**Voluntary Participation:** You/ your child’s participation is voluntary. You may choose not to participate or withdraw from the study at any time. Information about the books used in the study will be shared with you.

If you have any questions or concerns about this study, you may contact:
Principal investigator: Ann-Marie Orlando, M.S., CCC-SLP-ATP, School of Special Education, School Psychology, & Early Childhood Studies, 1403 Norman Hall, (352) 392-0701; or
Supervisor: Diane L. Ryndak, Ph.D., School of Special Education, School Psychology, & Early Childhood Studies, 1403 Norman Hall. (352) 392-0701

If you have any questions or concerns about your rights as a research participant you may be directed to the UFIRB Office, Box 112250, Gainesville, FL 32611-2250; phone (352) 392-0433.

**Agreement:** I have read the steps for this study to be conducted by Mrs. Orlando and Professor Ryndak on shared book reading with young children. I voluntarily give my consent for my child and me to participate. I have received a copy of the steps for this study.

<table>
<thead>
<tr>
<th>Parent or Legal Guardian</th>
<th>Date</th>
<th>Child’s Name (Printed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Witness</td>
<td>Date</td>
<td>Principle Investigator</td>
</tr>
</tbody>
</table>

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CHILD ASSENT

Protocol title: The Effects of Caregiver-Implemented Shared Book Reading Intervention on the communicative behaviors of Young Children with Significant Developmental Delays

Hi _____ (Child’s Name) ___, My name is (_,Researcher’s name), and I am from the University. I’d like your (mom/dad) and you to video your story book reading time. Your (mom/ dad) said it was OK. It takes a little while to read the stories (about 30 minutes). Would you like to read a story with (mom/dad)?

_____ (Child’s Name) _____ gave consent through (gestural or verbal) means to participate in the study: Impact of using Caregiver-Implemented Strategies on Children’s Communication during Shared book Reading

_________________________________ ______________________
Principle Investigator Date Child’s Name (Printed)

_________________________________
Witness Date
Participant ID: ______________________________________________________

Today’s date: _______________________ Child’s birth date: _________________

Please circle the one answer to each of the questions below with which you agree most. This is not a test and you will not receive a score. There is no single right or wrong answer to these questions.

1. What is your relationship to the child?
   a. Mother
   b. Father
   c. Grandparent
   d. Not biologically related: (explain: ___________________________)

2. How often does your child watch “educational television” programs like Sesame Street?
   a. Hardly ever
   b. Occasionally, but not more than once per week
   c. One or two times a week
   d. Nearly every day

3. How much time per day does your child spend watching TV?
   a. None
   b. Less that an hour
   c. From 1 up to 3 hours
   d. From 3 up to 5 hours
   e. From 5 up to 7 hours
   f. More than 7 hours

4. How often do you or another family member read a picture book with your child?
   a. Hardly ever
   b. Once or twice a month
   c. Once or twice a week
   d. Almost daily

5. At what age did you or another family member begin to read to your child?
   a. 0 – 6 months
   b. 7 – 12 months
   c. 13 months to 1 ½ years
   d. 1 ½ - 2 years
   e. Later than second birthday
6. How many minutes did you or another family member read to your child yesterday?
   a. 0 minutes
   b. 1 – 10 minutes
   c. 11 – 20 minutes
   d. More than 20 minutes

7. Approximately how many picture books do you have in your home for your child’s use?
   a. 0 – 2
   b. 3 – 10
   c. 11 – 20
   d. More than 20

8. How often does your child ask to be read to?
   a. Hardly ever
   b. Once or twice a month
   c. Once or twice a week
   d. Almost daily

9. If your child is read to, how much does your child enjoy it?
   a. A little
   b. Pretty much
   c. Very much
   d. Loves it

10. How often does your child look at books by himself or herself?
    a. Hardly ever
    b. Once or twice a month
    c. Once or twice a week
    d. Almost daily

11. How often do you go to the library with your child?
    a. Hardly ever
    b. Once or twice a month
    c. Once or twice a week
    d. Almost daily

12. How many children are there in your family who are younger than this child is.
    a. None
    b. 1
    c. 2
    d. 3
    e. More that 3 (How many? _____)
13. How many children are there in your family who are older than this child is.
   a. None
   b. 1
   c. 2
   d. 3
   e. More than 3 (How many? _____)

14. How much difficulty did you have with reading when you were in school?
   a. None
   b. Mild difficulty
   c. Moderate difficulty
   d. Severe difficulty

15. How many hours a day are you out of your home (work, school, shopping, etc.)?
   a. Less than 1 hours
   b. From 1 up to 2 hours
   c. From 2 up to 4 hours
   d. From 4 up to 8 hours
   e. More than 8 hours

16. How many adults (counting yourself) live in the same home with this child?
   a. 1
   b. 2
   c. 3
   d. 4
   e. More than 4 (How many? _____)

17. How would you describe your typical week?
   a. Generally calm and happy
   b. Some problems but mostly calm and happy
   c. Frequently problems but not all the time
   d. Problems nearly all the time

18. How well behaved is your child?
   a. Very well behaved; hardly ever any problems
   b. Problems sometimes, but generally well behaved
   c. Frequent problems, but not all the time
   d. Problems nearly all of the time
19. How many minutes per day do you spend reading (not counting times spent reading with your children)?
   a. Hardly any
   b. 2 – 15 minutes
   c. 16 – 30 minutes
   d. 31 – 60 minutes
   e. More than an hour

20. How much do you enjoy reading?
   a. Not at all
   b. Some
   c. Moderately
   d. Very much

21. How much does your spouse enjoy reading?
   a. Not at all
   b. Some
   c. Moderately
   d. Very much

22. How much time per day do you spend watching TV?
   a. None
   b. Less than an hour
   c. From 1 up to 3 hours
   d. From 3 up to 5 hours
   e. From 5 up to 7 hours
   f. More than 7 hours

23. How much did you enjoy school?
   a. Not at all
   b. Some
   c. Moderately
   d. Very much

24. Of the following list of racial and ethnic categories, which do you consider yourself to be?
   a. American Indian or Alaska Native
   b. Asian
   c. Black or African American
   d. Native Hawaiian or Other Pacific Islander
   e. White
   f. Hispanic or Latino
   g. Other __________________________
25. If you were born outside the United State, please specify the country in which you were born.  
________________________________________________________

26. Of the following list of racial and ethnic categories, which do you consider your spouse to be?  
   a. American Indian or Alaska Native  
   b. Asian  
   c. Black or African American  
   d. Native Hawaiian or Other Pacific Islander  
   e. White  
   f. Hispanic or Latino  
   g. Other __________________________

27. If your spouse was born outside the United State, please specify the country in which your spouse was born.  
__________________________________________

28. What language is usually spoken in your home?  
   a. English  
   b. Spanish  
   c. French  
   d. Other (Describe _____________________________________________)

29. Is English your native language?  
   a. Yes  
   b. No

30. If English is not your native language, what do you consider your understanding of written English to be? Please rate your level of understanding on a scale of 1-7.  
   1  2  3  4  5  6  7  
   Low  High

31. If English is not your native language, what do you consider your understanding of spoken English to be? Please rate your level of understanding on a scale of 1-7.  
   1  2  3  4  5  6  7  
   Low  High

32. Is English your spouse's native language?  
   a. Yes  
   b. No
APPENDIX C
HOLLINGSHEAD FOUR-FACTOR INDEX
(Hollingshead, 1975)

Name: ____________________________ Date: _____________________

1. Marital Status: ____________________________

2. Occupation: ____________________________

3. How many years of schooling have you completed
   a. Less than 7th grade
   b. Junior high school (9th grade)
   c. Some high school, but didn't finish
   d. High school graduate
   e. High school + some college or trade school
   f. 4-year college degree
   g. Graduate degree

4. Spouse's occupation: ____________________________

5. How many years of schooling has your spouse completed?
   a. Less than 7th grade
   b. Junior high school (9th grade)
   c. Some high school, but didn't finish
   d. High school graduate
   e. High school + some college or trade school
   f. 4-year college degree
   g. Graduate degree
APPENDIX D
GUIDING INTERVIEW QUESTIONS

Participant: ____________________ Date: __________ Informant: __________________

1. How does your child communicate with you?

2. List the words your child uses that you recognize.

3. What words, gestures, and signs does your child use?

4. What words, gestures, and signs do you use to communicate with your child?

5. What adaptations, if any, are you currently using to communicate with your child?

6. When did Early Steps personnel initially evaluate your child?

7. What services (frequency and type) is your child receiving through the Early Steps program?

8. Is your child receiving any other services (frequency and type) outside of the Early Steps program?

9. Tell me about any medications or special diets you are giving to him/her.

10. What are your primary concerns for your child’s development?

11. Does your child have any medical issues, such as seizures or ear infections?

Assessment information:

Protocol: ____________________ DOE: ____________________

Administered by: ____________________

Motor: _______ Self-help: _______ Social: _______ Academic: _______

Communication: _______
## APPENDIX E
UNSTRUCTURED JOINT ATTENTION ASSESSMENT PROTOCOL
(Loveland & Landry, 1986)

### Gesture only

<table>
<thead>
<tr>
<th>Task</th>
<th>Prompt</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shifting gaze:</td>
<td>The researcher will establish eye contact with a child then shift eye gaze to an object that is behind or beside, then look back at the child.</td>
<td>The child will look in the direction of the researcher’s gaze.</td>
</tr>
<tr>
<td>Pointing:</td>
<td>The researcher will point at an object.</td>
<td>The child will look at the object.</td>
</tr>
<tr>
<td>Showing:</td>
<td>The researcher will extend an object in view of the child.</td>
<td>The child will look at or comment about the object.</td>
</tr>
<tr>
<td>Tapping:</td>
<td>The researcher will tap an object of focus.</td>
<td>The child will look at or comment about the object.</td>
</tr>
<tr>
<td>Moving child’s hand:</td>
<td>The researcher will place the child’s hand on the object of focus.</td>
<td>The child will look at or comment about the object.</td>
</tr>
</tbody>
</table>

### Gesture-plus-language

<table>
<thead>
<tr>
<th>Task</th>
<th>Prompt</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shifting gaze:</td>
<td>The researcher will establish eye contact with a child, then shift eye gaze to an object that is behind or beside and say, “look at the ____”, then look back at the child.</td>
<td>The child will look in the direction of the researcher’s gaze.</td>
</tr>
<tr>
<td>Pointing:</td>
<td>The researcher will point at an object and say, “What’s that?”</td>
<td>The child will look at the object.</td>
</tr>
<tr>
<td>Showing:</td>
<td>The researcher will extend an object in view of the child, and say, “Look at this.”</td>
<td>The child will look at or comment about the object.</td>
</tr>
<tr>
<td>Tapping:</td>
<td>The researcher will tap an object of focus and says, “What to I have?”</td>
<td>The child will look at or comment about the object.</td>
</tr>
<tr>
<td>Moving child’s hand:</td>
<td>The researcher will place the child’s hand on the object of focus and says, “Look what you have.”</td>
<td>The child will look at or comment about the object.</td>
</tr>
</tbody>
</table>
Caregiver initiated prompting strategies

The caregivers were instructed on one three initial prompting strategies. These strategies were shown to increase their child’s responses to their caregiver’s protodeclarative bids for attention to an object about which they are talking (Paparella & Kasari, 2004; Rocha et al, 2007).

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Label and wait</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>The caregiver identifies (i.e., names or makes the sound of) pictures, or words to which his/her child already is focused, and then waits 3 s for the child’s response. (Paparella &amp; Kasari, 2004; Rocha et al., 2007; Whalen &amp; Schreibman, 2003).</td>
</tr>
</tbody>
</table>
| Decision Rules:           | a) The strategy is marked when the behavior ends (i.e., at the interval during which the child responds or 3 s lapse, whichever comes first).  
b) The strategy is marked after the caregiver has labeled the picture, and then waited 3 s before initiating a follow-up prompt.  
c) If the caregiver initiates the bid in one interval and the child responds in the following interval, the caregiver bid is coded in the same interval as the child’s response. |

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Tap and wait</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>The caregiver repeatedly touches picture to shift their child’s focus to a new location, and then waits 3 s for the child’s response (Paparella &amp; Kasari, 2004; Rocha et al., 2007; Whalen &amp; Schreibman, 2003).</td>
</tr>
</tbody>
</table>
| Decision Rules:           | a) The caregiver must tap the location on the page to shift the child’s attention to the location. Pointing is not sufficient for this code.  
b) If the caregiver initiates the bid in one interval and the child responds in the next interval, the caregiver bid is coded in the same interval as the child’s response. |

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Request and wait</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>The caregiver asks the child to point to a picture, label a picture, or act on a picture, and then waits 3 seconds for the child’s response (Light et al., 1994; Paparella &amp; Kasari, 2004).</td>
</tr>
</tbody>
</table>
| Decision Rules:           | a) The strategy is marked at the end of the behavior.  
b) The request must be related to the shared book reading interaction.  
c) If the caregiver initiates the bid in one interval and the child responds in the next interval, the caregiver bid is coded in the same interval as the child’s response. |
Caregiver follow-up prompting strategies

Each caregiver was instructed on two follow-up prompting strategies. These strategies can be used in conjunction with the intervention strategies and were taught to the caregiver as options for prompting his/her child to respond when the child did not respond to the caregiver's initial prompt for communication.

<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Helping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>Following an initial bid for communication (i.e., label-and-wait, tap-</td>
</tr>
<tr>
<td></td>
<td>and-wait, and request-and-wait), if the child did not respond, the</td>
</tr>
<tr>
<td></td>
<td>caregiver could assist the child to attend to the picture in the book</td>
</tr>
<tr>
<td></td>
<td>by placing their child’s hand on the object or picture (Rocha et al.,</td>
</tr>
<tr>
<td></td>
<td>2007; Whalen &amp; Schreibman, 2003).</td>
</tr>
<tr>
<td>Decision rules:</td>
<td>a) This behavior can only be marked when it follows an initial bid for</td>
</tr>
<tr>
<td></td>
<td>communication (i.e., label-and-wait, tap-and-wait, and request-</td>
</tr>
<tr>
<td></td>
<td>and-wait),</td>
</tr>
<tr>
<td></td>
<td>b) If the caregiver labels after the child initiates by pointing to the</td>
</tr>
<tr>
<td></td>
<td>object or labeling the object, the strategy of label-and-wait is</td>
</tr>
<tr>
<td></td>
<td>marked.</td>
</tr>
</tbody>
</table>

| Strategy:         | Modeling                                                               |
|-------------------|                                                                       |
| Definition:       | Following the caregiver’s initial bid for communication (i.e., label-  |
|                   | and-wait, tap-and-wait, and request-and-wait), if the child did not    |
|                   | respond in the desired manner, the caregiver could: a) perform the    |
|                   | expected child behavior (e.g., repeats the child’s utterance or       |
|                   | repeats the child’s action) for the purpose of showing the child how  |
|                   | to perform the expected behavior (Paparella & Kasari, 2004), or b)    |
|                   | expand on the child’s utterance (ex. Child says, “bear,” then         |
|                   | caregiver says, “brown bear.”                                        |
| Decision rules:   | a) This behavior can only be marked when it follows a label-and-wait, |
|                   | tap-and-wait, or request-and-wait.                                    |
|                   | b) If the child initiates and the caregiver performs the expected     |
|                   | behavior or expands the child’s utterance, then this is marked as a  |
|                   | label-and-wait.                                                      |
Communicative forms

Communicative forms are the manner in which communication is represented and conveyed to another person with whom there is joint attention. For example, if a child vocalizes about a picture, to which the child and caregiver are jointly focused then the child has communicated with the other person. However, if the child vocalizes to the picture that is not of joint focus and does shift the caregiver’s attention to the picture of interest then the communicative form was not communicated to the other person. This would not be considered a communicative form because of the lack of joint attention. For purposes of the present study, data were collected only on communicative forms that were used with joint attention. Observers coded the following communicative forms.

<table>
<thead>
<tr>
<th>Form:</th>
<th>Multiple words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>A vocalization that is recognized as a combination of spoken words. When more than one word is uttered it then it is coded as multiple words (McLean, Brady, McLean, &amp; Behrens, 1999).</td>
</tr>
<tr>
<td>Decision rules:</td>
<td>A word is differentiated from a canonical vocalization in that the child speaks the combination of spoken words in the conventional manner or closely approximates the targeted words.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Form:</th>
<th>Single word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>A single word is a vocalization that is recognized as a conventional spoken word. If more than one word is uttered it then it is coded as a multiple word (McLean, Brady, McLean, &amp; Behrens, 1999).</td>
</tr>
<tr>
<td>Decision rules:</td>
<td>A word is differentiated from a canonical vocalization in that the child speaks a word in the conventional manner or closely approximates the target word. For example, if the child were to use a substitution for the initial consonant such as “tat” for “cat” then it would be coded as a word.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Form:</th>
<th>Canonical vocalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>Utterances or vocalizations that have at least one consonant-vowel sequence that is coordinated with attention to the caregiver or object of interest related to the activity (Yoder et al., 1998).</td>
</tr>
<tr>
<td>Decision rules:</td>
<td>a) This does not refer to laughs, coughs, or burps not associated with the shared book reading. b) The behavior is coded at the onset. c) If a child closely approximates the targeted word then it is marked as a word. For example, if a child says “ha” while looking at a picture of a hat then it would be marked as a word. However, if the</td>
</tr>
</tbody>
</table>
child says “da” while pointing a picture of a lion then if would be marked as a canonical vocalization.

<table>
<thead>
<tr>
<th>Form:</th>
<th>Vocalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>Productions of a stream of air that consists at least of a voiced vocalic or consonant syllabic element directed toward the caregiver or object of interest related to the activity (Rescorla &amp; Ratner, 1996). For example, a vocalization will be coded when a child utters “a” while focused on a picture.</td>
</tr>
</tbody>
</table>
| Decision rules: | a) This does not refer to laughs, coughs, or burps not associated with the shared book reading or toy of interest.  
b) Sounds associated with the book or object of interest such as animal sounds or motor sounds will be coded as a vocalization. If these sounds contain a consonant-vowel sequence then they would be coded as a canonical vocalization.  
c) The behavior is coded at the onset. |

Communicative functions

A communicative function is the purpose of an attempt to communicate. For the present study, a child’s communicative function was coded only when the child attempts to communicate about the object of interest (e.g., book used during shared book reading). Other communicative attempts by the child (e.g., requesting an object that is not related to shared book reading) were not coded or were protests to leave the sessions. However, if the child were rejecting a request, the rejection was coded. The observers coded the following communicative functions.

<table>
<thead>
<tr>
<th>Function:</th>
<th>Initiating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>Any attempt by the child to begin to participate or interact with the caregiver or shift focus during the session to a different location in the book (Trudeau et al., 2003). This includes the child’s attempts to comment about or identify an object, action, or person; or attempts to request information or action. For example, a child might point to a picture or point to a picture and label it before the caregiver prompts them to do so, or point to a picture and look at the caregiver to jointly attend to the picture. A child also might reengage with the book, but not as a direct response to their caregiver.</td>
</tr>
</tbody>
</table>
| Decision rules: | a) This is only coded when the interaction is related to the book or object of interest.  
b) The behavior is coded at the onset. |
<table>
<thead>
<tr>
<th>Function:</th>
<th>Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>Any attempt by the child to participate or interact following a bid for interaction from the caregiver (Trudeau et al., 2003). For example, when asked, “What is that?” the child might point to the ball and say “ball.”</td>
</tr>
</tbody>
</table>
| Decision rules: | a) The response does not have to be correct to be counted as a response.  
b) Responding can only be coded after a caregiver used a prompting strategy. |
APPENDIX G
CAREGIVER PROTOCOL FOR USING THE PROMPTING STRATEGIES

Participant: _______________________________ Date of Intervention: _______________________________

Goal: Increase child use of communicative forms and functions

Setting/Activity: Caregiver-child shared book reading in the home. Note: These rows are not sequential.

<table>
<thead>
<tr>
<th>Initial Prompts</th>
<th>Desired Child Behavior(s)</th>
<th>Feedback/Consequence:</th>
<th>Follow-up Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>The caregiver labels a picture to which the child is focused, and then waits up to 3 seconds for the child to respond.</td>
<td>The child labels the picture in the book.</td>
<td>The caregiver provides verbal affirmation, or gives social praise.</td>
<td>If the child does not respond, the caregiver can assist the child to attend to the picture in the book, helping the child shift attention (i.e., placing the child’s hand on the picture) or modeling the expected child behavior.</td>
</tr>
<tr>
<td>The caregiver taps several times a picture in the book then waits up to 3 seconds for the child to respond.</td>
<td>The child shifts attention to the picture in the book.</td>
<td>The caregiver provides verbal affirmation, or gives social praise.</td>
<td>If the child does not respond, the caregiver can assist the child to attend to the picture in the book, helping the child shift attention (i.e., placing the child’s hand on the picture) or modeling the expected child behavior.</td>
</tr>
<tr>
<td>The caregiver requests the child to point to a picture or label a picture or an object, then waits up to 3 seconds for the child to respond.</td>
<td>The child points to a picture or labels a picture.</td>
<td>The caregiver provides verbal affirmation, or gives social praise.</td>
<td>If the child does not respond, the caregiver can assist the child to attend to the picture in the book, helping the child shift attention (i.e., placing the child’s hand on the picture) or modeling the expected child behavior.</td>
</tr>
</tbody>
</table>

Adapted from Ryndak, Montgomery, & Barnitt (2007) and Snyder, Hemmeter, Sandall, & McLean (2007)
**Written description of interventions for caregivers.** Getting your child to engage with a book is the first step in creating a shared book reading routine. Engaging your child in a shared book reading routine might facilitate communication between you and your child. You can gain your child’s attend to the book by decreasing the number of distractions such as TV and radio noise, and arranging the environment so that you can see the book and your child’s face and your child can see the book and your face. As you read the book with your child, you should try to maintain this arrangement.

To increase your child’s interest in the book, label pictures and words on which your child is already focused. After you label the picture, wait 3 seconds for your child to respond. Your child can respond by either naming the picture, looking at the picture, or pointing to the picture. When your child names the picture, looks at the picture, or points to the picture, you can provide verbal affirmation, or give social praise. If your child does not respond you can either put your child’s hand on the picture or name the picture yourself.

Tapping pictures in the book can help your child shift attention to a different picture in the book. Tap the picture in the book a few times then wait 3 seconds. Your child can respond by looking at the different picture in the book, touching the picture or naming the picture. When your child looks at the picture, touches the picture or names the picture you can provide verbal affirmation or social praise. If your child does not shift attention after you have tapped the picture and waited 3 seconds, you can help your child by placing your child’s hand on the picture or naming the picture.

Requesting your child to point to a picture, name a picture, or turn a page of the book can provide an opportunity for your child to participate in the shared book reading
routine. After you request your child to point to a picture, name a picture, or look at a picture, wait 3 seconds for your child to respond. Waiting for your child to respond may allow him/her the opportunity to respond independently. Your child might respond by pointing to the picture, naming the picture, or looking at a picture. When your child points to the picture, names the picture, or looks at a picture, you can provide a verbal affirmation or social praise. If your child does not respond after you have waited 3 seconds you can help your child by placing your child’s hand on the picture, helping your child turn the page, or naming the picture. (Paparella & Kasari, 2004; Senechal, Cornell, & Broda, 1995).

Ideas: ________________________________________________________________
______________________________________________________________________
______________________________________________________________________
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______________________________________________________________________
______________________________________________________________________
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______________________________________________________________________
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______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
APPENDIX H
BOOK SELECTION CRITERIA

a) Contains vocabulary words and concepts familiar to and appropriate for children 12 to 36 months such as bath time and familiar objects such as a ball or spoon.

b) Sets the context for interactions during shared book reading using repeated words or phrases, songs, or themes or through manipulative features such as flaps (excluding books with alphabet letters and numbers).

c) Contains simple pictures or photographs not complicated by backgrounds that compete with the salient feature.

d) Contains pictures or photographs closely representing the object of interest.

e) Contains text closely related to the picture or photograph on the page and has limited words or phrases on each page.

f) Has a sturdy construction for independent exploration.

(Fletcher & Sabo, 2006; Fletcher & Reese, 2005; Schickedanz, 1999; Zeece & Churchill, 2001)
APPENDIX I  
LIST OF BOOKS USED

<table>
<thead>
<tr>
<th>Book title</th>
<th>Publication year</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dear Zoo</td>
<td>(1982)</td>
<td>Rod Campbell</td>
</tr>
<tr>
<td>From Head to Toe</td>
<td>(1997)</td>
<td>Eric Carle</td>
</tr>
<tr>
<td>One Duck Stuck</td>
<td>(2001)</td>
<td>Phyllis Root</td>
</tr>
<tr>
<td>Pat the Bunny</td>
<td>(2007)</td>
<td>Golden books</td>
</tr>
<tr>
<td>Bunny Kisses</td>
<td>(2007)</td>
<td>Golden books</td>
</tr>
<tr>
<td>Goodnight Moon</td>
<td>(1947)</td>
<td>Margaret Brown</td>
</tr>
<tr>
<td>Quiet Loud</td>
<td>(2003)</td>
<td>Leslie Patricelli</td>
</tr>
<tr>
<td>Biscuit</td>
<td>(2005)</td>
<td>Alyssa Satin Capucilli and Pat Schories</td>
</tr>
<tr>
<td>Very Hungry Caterpillar</td>
<td>(1994)</td>
<td>Eric Carle</td>
</tr>
<tr>
<td>Planes</td>
<td>(1998)</td>
<td>Byron Barton</td>
</tr>
<tr>
<td>Very Quiet Cricket</td>
<td>(1997)</td>
<td>Eric Carle</td>
</tr>
</tbody>
</table>
APPENDIX J
BOOK READING DATA COLLECTION SHEET

Participant: ___________________________  Week of: _____________________________

<table>
<thead>
<tr>
<th>Day of week</th>
<th>Time begin</th>
<th>Time end</th>
<th>Title of book(s) read</th>
<th>How did it go? What will you change for next time?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td></td>
<td></td>
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<td>Tuesday</td>
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<td>Wednesday</td>
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<td>Thursday</td>
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<td>Friday</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX K
VIDEO RECORDING PROTOCOL

The steps for using the digital video camera:

(a) I recommend making sure the battery is charged before using the camera. If the battery is low, you can charge the camera or plug it in to the wall socket while recording.

(b) Attach the tripod to the bottom of the camera by inserting the screw on the top of the tripod into the opening on the bottom of the camera.

(c) Connect wireless receiver into the adapter then into the external microphone jack on the left side of camera

(d) Connect microphone and microphone transmitter, then attach microphone to your collar about six inches from your mouth.

(e) Connect the adapter to the wireless receiver on one end and the camera on the other.

(f) Turn on the camera, wireless receiver, and microphone transmitter.

(g) Position the camera so that your face, your child’s face, and the book are in view. The camera should be out of your child's reach but close enough to capture you both clearly.

(h) When the camera is turned on, it is ready to record. Press the red stop/record button in the center and it will begin recording. Press it again and it will stop recording.

(i) To review your video, press the review button.

(j) When you have finished recording be sure to turn the microphone transmitter, receiver, and camera off.
APPENDIX L
CAREGIVER INSTRUCTION CHECKLIST

Participant: _____________________________ Date: ______________________

1) Discuss the benefits of shared book reading and the importance of communication for the child.

2) Define and model how to use each of the four intervention strategies how to use the prompting strategies when there is no response or an incorrect response within 3 sec, and how the parent should respond when the child’s response is correct (Rocha et al., 2007).
   a. Provide handout to the caregivers explaining of each intervention strategy and prompting strategy.
   b. Give the caregiver an opportunity to ask questions about and make comments to verify their understanding of the intervention strategies and prompting strategies.

3) Role-play the use of the intervention and prompting strategies during a 15 min shared book reading session.

4) The caregiver demonstrates their understanding of the intervention strategies and prompting strategies by using them while conducting a shared book reading session with the researcher. The researcher provides corrective feedback throughout the session.
1) *Set the environment:* The caregiver arranges the environment to promote interaction. (Paparella & Kasari, 2004).

- Explanation provided
- Researcher role-play
- Caregiver role-play
- Corrective feedback: ________________________________

2) *Label and wait:* The caregiver names pictures and words to which the child already is focused, then waits up to 3 seconds for the child’s response. (Paparella & Kasari, 2004; Rocha et al., 2007; Whalen & Schreibman, 2003).

- Explanation provided
- Researcher role-play
- Caregiver role-play
- Corrective feedback: ________________________________

3) *Tap and wait:* The caregiver touches the picture several times to shift their child’s focus to a new location, and then waits up to 3 seconds for the child’s response (Paparella & Kasari, 2004; Rocha et al., 2007; Whalen & Schreibman, 2003).

- Explanation provided
- Researcher role-play
- Caregiver role-play
- Corrective feedback: ________________________________

4) *Request and wait:* The caregiver asks the child to point to a picture, label an object or picture, or act on picture, then waits up to 3 seconds for the child’s response (Light et al., 1994; Paparella & Kasari, 2004).

- Explanation provided
- Researcher role-play
- Caregiver role-play
- Corrective feedback: ________________________________

5) *Helping:* Following an initial bid for communication (i.e., label-and-wait, tap-and-wait, and request-and-wait), if the child does not respond, the caregiver assists the
child to attend to a picture in the book by placing the child’s hand on the picture (Rocha et al., 2007; Whalen & Schreibman, 2003).

☐ Explanation provided
☐ Researcher role-play
☐ Caregiver role-play
☐ Corrective feedback: __________________________________________________________________________

_____________________________________________________________________________________

6) Modeling: Following an initial bid for communication (i.e., label-and-wait, tap-and-wait, and request-and-wait), if the child does not respond, the caregiver performs the expected child behavior such as labeling the picture (Paparella & Kasari, 2004).

☐ Explanation provided
☐ Researcher role-play
☐ Caregiver role-play
☐ Corrective feedback: __________________________________________________________________________

_____________________________________________________________________________________

______________________________________________
Signature of caregiver

______________________________________________
Signature of researcher
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Definition</th>
<th>Accuracy/Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Label and wait:</strong></td>
<td>The caregiver names picture or words to which the child already is focused, then waits up to 3 seconds for the child’s response (Rocha et al., 2007; Whalen &amp; Schreibman, 2003).</td>
<td></td>
</tr>
<tr>
<td><strong>Tap and wait:</strong></td>
<td>The caregiver touches several times the picture to shift the child’s focus to a new location, and then waits up to 3 seconds for the child’s response (Paparella &amp; Kasari, 2004; Rocha et al., 2007; Whalen &amp; Schreibman, 2003).</td>
<td></td>
</tr>
<tr>
<td><strong>Request and wait:</strong></td>
<td>The caregiver asks the child to point to a picture, label a picture, or act on a picture, then waits up to 3 seconds for the child’s response (Light et al., 1994; Paparella &amp; Kasari, 2004).</td>
<td></td>
</tr>
<tr>
<td><strong>Helping:</strong></td>
<td>Following an initial bid for communication (i.e., label-and-wait, tap-and-wait, and request-and-wait), if the child does not respond, the caregiver assists the child to attend to a picture in the book by placing their child’s hand on the picture (Rocha et al., 2007; Whalen &amp; Schreibman, 2003).</td>
<td></td>
</tr>
<tr>
<td><strong>Modeling:</strong></td>
<td>Following an initial bid for communication (i.e., label-and-wait, tap-and-wait, and request-and-wait), if the child does not respond, the caregiver performs the expected child behavior (Paparella &amp; Kasari, 2004).</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX N
SOCIAL VALIDITY QUESTIONNAIRE

Participant: ___________________________ Date: _______________

Please answer the questions below in a way that best describes your experience using the strategies provided.

1. How difficult was it to use the interventions during shared book reading with your child?
   
   not at all  somewhat  moderately  very
   1         2         3         4

2. How useful was the instructional session about the intervention?
   
   not at all  somewhat  moderately  very
   1         2         3         4

3. Did you see a change in your child’s use of communication?
   Yes       No

4. If you saw a change, please describe. ________________________
   ____________________________________________________________

5. Did you see a change in the amount of time your child engaged in shared book reading?
   Yes       No

6. If you saw a change, please describe. ________________________
   ____________________________________________________________

7. How likely are you to continue to use these interventions during shared book reading now that the study is over?
   
   not at all  somewhat  moderately  very
   1         2         3         4

8. How likely are you to use these strategies in other situations such as during bath time or when eating?
9. How likely are you to recommend these strategies to other caregivers?

<table>
<thead>
<tr>
<th>not at all</th>
<th>somewhat</th>
<th>moderately</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

10. Was there one component of the intervention you felt was more useful?

Yes  No

11. If so, please describe. _______________________________________________

____________________________________________
LIST OF REFERENCES


Early Intervention Program for Infants and Toddlers with Disabilities, 76 C.F.R. § 188 (2011).


Hollingshead, W. (1975). *The Hollingshead four-factor index of socioeconomic status*. Unpublished manuscript, Department of Sociology, Yale University, New Haven, CT.


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BIOGRAPHICAL SKETCH

Ann-Marie Dalrymple Orlando was born in Rota, Spain, but grew up mostly in Pensacola, Florida. She graduated from Escambia High School in 1980, and earned her Master of Science in Speech and Hearing Sciences from the University of South Alabama in 1987.

Upon graduation from the master's program, Ann-Marie worked in the public schools as a speech-language pathologist and educational audiologist, working with students with disabilities and students with severe emotional disturbances, providing instruction to the nursing and therapy staff in hearing screening procedures, and monitoring the amplification needs of students with hearing impairments. To improve her ability to serve this population, she attended numerous in-services on topics such as oral motor therapy, seating and positioning, and assistive technology.

Through her interest in assistive technology, specifically augmentative/alternative communication (AAC), her duties began to include providing AAC evaluations and services and overseeing low-incidence programs, including speech-language, occupational, and physical therapy, and services for students with vision and/or hearing impairment. In that position, she developed leadership skills and attended several workshops in the area of leadership including: Seven Habits of Highly Effective People and Formative and Summative Teacher Evaluation Tools.

After five years in that role, she took a position as technology resource specialist with the Florida Diagnostic and Learning Resources System in Reddick, Florida. In that position, she provided in-service and technical assistance in the areas of augmentative communication, assistive technology, and accommodation and modifications for school
districts, teachers, and parents. She also worked directly with students to evaluate their need for assistive technology devices and services in the classroom.

In August 2003, she joined the University of Florida’s Center for Autism and Related Disabilities (CARD), where she has worked with parents, teachers, and agency providers to develop home, educational, and employment services to meet the diverse needs of children and adults with autism spectrum disorders. In this position, she believes she has learned the most about serving individuals with disabilities from the constituents themselves and from their caregivers. The mission of CARD is to build the capacity of those who serve this population, in keeping with her own ideas of how to serve individuals with disabilities.

She chose to pursue her education at the University of Florida because of its reputation for creating leaders in the field of special education and its diverse and accomplished faculty. Upon completion of her doctorate in special education, she plans to continue to carry out research in the field of significant disabilities and to assist caregivers and professionals meet the unique needs of individuals with significant disabilities.