THE EFFECTS OF PARENT-CHILD LITERACY TRAINING USING CONTENT ACQUISITION PODCASTS WITH CHILDREN AT-RISK FOR READING DISABILITY

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APPROVAL OF THE DISSERTATION

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ABSTRACT

The purpose of this multiple baseline single subject study was to investigate the effects of Content Acquisition Podcasts (CAPs) to provide literacy training to parents of young children with or at-risk for disability. A total of three mother-child dyads participated in the 10-week study. The intervention focused on increasing parent-child interactions in the home through shared storybook reading and language interactions. During baseline each mother read to their child using books provided by the researcher. In addition, each child was asked to wear a digital language processor (DLP) for 8-12 hours at a time to record daily language interaction in the home. During the intervention phase, three mothers watched a CAP on shared storybook reading and language interaction each week for a total of five weeks. After watching the CAP, the mother received a book and was asked to read the book three times with the child throughout the week. Dependent variables included a shared storybook reading question scale (adapted from the ACIRI) and Digital Language Processor (DLP) language interaction recordings. The question scale focused specifically on the number of questions asked, the number of print or picture references, and the number of times the mother responded or expanded on the child's verbalizations.

Keywords: emergent literacy, early literacy, family literacy, shared storybook reading, dialogic reading

DEDICATION

This dissertation is dedicated to one of the most amazing educators I ever knew, my father, Malcolm Wray Cole. His patience, dedication, and advocacy as an educator and dad continue to inspire me daily, playing a huge role in my journey and decision to embark on this doctoral adventure. The memory of his joyous grin combined with his love for life and slick humor has helped me through many long nights of writing and research.

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CHAPTER I

INTRODUCTION

According to the National Assessment of Education Progress (NAEP), approximately one-third of America's fourth grade students fail to meet the basic levels of reading (National Center for Education Statistics [NCES], 2009). In a national student sample, 25% of eighth-grade students read at a below-basic level, and only 35% read at or above a proficient level (National Center for Education Statistics [NCES], 2009). Currently, 25% of adults in the U.S. lack the basic literacy skills required to hold a typical job (National Center for Education Statistics [NCES], 2009). These alarming statistics can contribute to numerous risk factors that are experienced as a child.

Risk Factors

Reading is a fundamental skill that is necessary for future success in academic content areas (Farrell & Cirrincione, 2011) and life. If a child does not learn the basics of reading at an early age then he or she is unlikely to learn these skills at all (Moats, 1999). Illiteracy leads to poor life outcomes, as studies show that it correlates with unemployment, delinquency, incarceration (Lerner, 2003), and poorer health outcomes. There are many risk factors that contribute to reading disabilities in children. These factors can be child-based, familial-based, or community-based (Snow, Burns, Griffin, 1998). Child-based factors include: cognitive deficits, hearing impairments, early language impairments, and attention deficit/hyperactivity disorder. These factors are determined by assessing the child and are thought to correlate with a child's learning difficulties. Familial-based factors include: family history of reading difficulties, the home literacy environment, parent-child language interaction, parents' level of education

and the family's socioeconomic status. These factors are both genetic and environmental. Risk factors that involve a child's community include: the neighborhood, family culture, and the school the child attends. Snow, Burns, and Griffin (1998) found that there is no single risk factor that can predict reading disability on its own. This means that it is important to consider multiple risk factors when predicting a child's future achievement. Furthermore, many of these factors, especially a child's genetics, cannot be altered, however; reading and language interventions can change the home literacy environment.

Moats (1999) found that 95% of all children can be taught to read, however, children that display more than one of the risk factors mentioned above, are likely to begin school less prepared to learn to read (Snow, Burns, Griffin, 1998). This indicates a need for interventions to begin early in a child's life.

Early Literacy

The National Association for the Education of Young Children (NAEYC) states that the infant, toddler, and preschool years are where "children take their first critical steps towards learning to read and write" (NAEYC, 1998). Literacy is conventionally defined as just that, the ability to read and write, but it involves complex skills that begin at birth and develop throughout childhood (Wasik & Herrmann, 2004). Studies show that these early literacy experiences and interventions play a large role in the academic success and outcomes of children (e.g., Cooper, Crosnoe, Suizzo, & Pituch, 2009; Wasik, Bond, & Hindman, 2006; and Whitehurst & Lonigan, 1998). Literacy develops on a continuum, starting at birth. The development that occurs before a child receives formal (in-school) reading and writing instruction is referred to as *emergent literacy,* specific interactions and experiences are necessary for this development.

The term, emergent literacy, is derived from Marie Clay's (1993) observational study of children's reading behavior; recognizing that preschool literacy skills are influenced by family literacy interactions and the environment at home. Emergent literacy is sometimes referred to as *early literacy* (Neuman & Dickinson, 2001), either way literacy exposure and activities during this time period have a large impact on future reading achievement (Velluntino, Scanlon, Small, & Fanuele, 2006).

Language and Literacy Techniques

Many children spend this formative literacy time period at home with family members. Thus, family members play an important role in the development of these social and cultural processes that a young child experiences; therefore, in-home or *family literacy i*s a crucial component to a child's future literacy outcomes. Wasik and Hermman (2004) define family literacy "as the literacy beliefs and practices among family members and the intergenerational transfer of literacy to children" (p. 3). Parents and caregivers often act as a child's first teacher as their interactions have a significant and early effect on a child's early literacy skills (e.g., Hart and Risley, 1995; Payne, Whitehurst, Grover, & Angell, 1994; Rush, 1999).

There are many factors involved in family literacy: socioeconomic status, culture, parenting style, home environment, adult education, intervention, and parent education. It is difficult to change or intervene on many of these family factors; however, interventions can be used to impact a parent's literacy knowledge and parent-child interactions.

Past research has focused on three main intervention types: shared storybook reading, parent-child language interactions, and awareness of print. The intervention of the proposed study will focus enhancing language interactions and shared storybook

reading, thus, these two intervention types are outlined below.

Shared storybook reading. One way to enhance a child's early literacy skills is through shared storybook reading. This idea is not revolutionary, beginning in the 1960s scholars began to stress the importance of family book reading in the home environment, indicating that adult-child book interactions are important factors in early literacy development (e.g., Goodman, 1986; Leichter, 1979). This type of research increased in the 1980s as several ethnographic studies gained the attention of policymakers and the government (Heath, 1983; Taylor, 1983; van Kleeck & Schuele, 2010).

In 1988, Whitehurst and colleagues coined the term *dialogic reading*. Dialogic reading is different from normal shared storybook reading because it shifts the role that an adult would normally play when reading a story to a child. The child is no longer only a listener and instead learns to take part in the storytelling, the role typically held by the adult. This is a gradual shift and happens when the adult begins to ask the child questions about the story. In the beginning, these questions might require yes/no responses but as the child becomes more comfortable with his or her role the adult begins to ask more open-ended questions, becoming an active listener. During this process the adult also learns to prompt the child to expand on his or her answers so that descriptions are included.

For example, transitioning from the dialogue; "Does Spot look sad?", to "How does Spot feel?", to "Why does Spot feel sad?", and then eventually to "Can you tell me what Spot is doing on this page?". Research indicates that dialogic reading is an auspicious tool for enhancing the quality of shared reading interactions and thus transmits early literacy knowledge to children through the reading of picture books (e.g.; Arnold,

Lonigan, Whitehurst, & Epstein, 1994; Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1988; Whitehurst et al., 1994).

Currently, there are several training programs that use the research-based dialogic reading technique to train teachers and parents on adult-child book reading interactions. One well-known program is called *Read Together Talk Together* (RTTT; Pearson Early Learning, 2002). The program is available for Toddlers (ages 2-3) and Preschool and Kindergarteners (ages 4-5). The program guide teaches adults to use dialogic reading strategies and includes a teacher training video and a separate parent training video. The approach is interactive and studies have shown that the program improves children's expressive language, sound and letter identification, emergent writing skills, and knowledge of print concepts (Blom-Hoffman, O'Neil-Pirozzi, & Cutting, 2006).

RTTT includes mnemonic devices to help parents remember a sequence of how to interact when reading with a child. The first is called the PEER sequence and stands for *prompt, evaluate, expand,* and *repeat.* The second sequence is called CROWD and aims to help parents determine the kinds of questions they should ask the child during the dialogic reading process. The letters in CROWD stand for *completion, recall, open-ended questions, wh (what, why, where)-prompts,* and *distancing.* The program includes a set of books with prompt cards for parents to use as a guide. The guide includes a summary of the book, directions for reading it, specific prompt examples, and a list of vocabulary terms that come from the books.

In addition to this program, there is another similar video training program called *Hear and Say* based on Whitehurst et al.'s (1988) dialogic reading program. *Hear and Say* is a community-based reading intervention, specifically geared towards training

parents of two and three year old children. It is a stand-alone video program that intends to promote the language skills of young children. The training is broken into two sessions. The first instructs parents to switch roles with their child and become the active listener while encouraging the child to become an active storyteller. In the second session, parents are shown how to increase verbal expansions and open-ended questions.

These are just two examples of specific shared storybook reading programs that are often used in family literacy interventions. Other adaptations exist and the level of guidance provided for the intervention depends on funding, resources, and overall focus of the family literacy intervention.

Language interaction. The adult-child language interactions that a child is exposed to prior to school can have a profound influence on the quality and quantity of his literacy experiences and knowledge (Snow, Burns, & Griffins, 1998). These language interactions can occur during all parts of the day and do not have to involve a book reading interaction. There are many different ways in which these learning opportunities occur. Research shows that singing songs, chanting nursery rhymes, answering and asking questions, story telling, and mealtime conversations are activities that help children develop and value oral language (e.g., Baker, Serpell, & Sonnenschein, 1995; Heath, 1983; Snow & Tabors, 1993). Studies of early oral language development show that parent-child interactions are reciprocal as children influence how adults behave toward them and adults influence children's learning opportunities (e.g., Belsky, Lerner, & Spanier, 1984; Lewis & Feinman, 1991). These learning opportunities are key components to a child's future reading success, yet they often do not occur in the homes of many children, due to the previously discussed risk factors. Parents can be taught how

to add or increase these language interactions throughout their daily home activities, particularly during book reading interactions. Again, the level of guidance given to parents depends on funding, resources, and overall intervention focus. Below you will find some examples of family literacy programs that exist or have existed in the United States.

Home Literacy Programs

Home visiting programs multiplied throughout the United States in the 1980s and 1990s (Bryant & Wasik, 2004), these home intervention trainings and visits are usually described as family-focused as they aim to build trust between the visitor and parent. Home visits can promote both adult and child literacy and help provide a better understanding of the family's home literacy environment. These interventions intend to increase the quality and quantity of the physical, social, and symbolic resources in the home.

Three well-known government funded home intervention programs include: the Parent as Teachers (PAT) model, Even Start family literacy program (Bryant & Wasik, 2004), and Early Head Start. The PAT model began in 1981 and currently serves about 300,000 children in over 3,000 programs. The PAT model consists of four components: personal visits, group meetings, screening, and a resource network. PAT is just a literacy program but has the philosophy that parents can serve as teachers if they become more aware of and involved in the home literacy environments of their children. The model has three main approaches in which parent educators offer research-based information and evidence-based practices in three areas: parent-child interaction, development-centered parenting, and family well-being. The goal is to educate parents in these areas so

that they will improve their knowledge of their child's health and development while also improving their actual parenting practices and parent-child relationships. Long term outcomes include prevention of child abuse, increased school readiness, and increased parent involvement in their child's care and education.

The Even Start program integrates early childhood education for low-income children and their caregivers. In 2000-2001, Even Start served approximately 32,000 families with $150 million in funding. The next year the budget for Even Start increased to $250 million (U.S. Department of Education, 2003). Even Start involves early childhood education, parenting education, adult education, and parent-child joint literacy activity components, like dialogic reading. It consists of both center and home-based interventions.

Early Head Start (EHS) is a community-based program for low-income families with young children. EHS deals with both prenatal and early childhood development as it strives to: 1) promote healthy prenatal outcomes for pregnant women, 2) enhance the development of very young children, and 3) promote healthy family functioning (EHS-NRC, 2013).

Difficulties with home intervention programs. While these programs do not focus solely on the home literacy environments, they deal with many aspects of emergent literacy development. These federally funded programs have served many families, but there are still many families that would benefit from intervention programs. There are also issues that arise when implementing these interventions, which might change the effectiveness of a program.

For example, these home-based intervention programs require substantial money,

organization, and resources. Bryant and Wasik (2004) explain that home intervention programs often face many difficulties and fail to consider the training and supervision of the home visitors. Visitors must have extensive and appropriate training in order to successfully engage families. The visitors must possess relationship-building skills, be knowledgeable of adult learners, and possess innovative problem-solving skills. The home visitors must also help the family understand how the home literacy environment can affect the literacy outcomes of their children. In reality, visitors are often undertrained and overworked (Wasik & Roberts, 1994) and the families that they work with have little time or energy to devote to literacy training. Olds and Kitzman (1993) studied home literacy programs and found that only six out of the 15 programs showed significant benefits for children. Similarly, Gomby, Culross, & Behrman (1999) reviewed six home-based intervention programs and found that their benefits were limited.

There is a definite disparity between the importance of home-literacy intervention and their ability to positively impact children and families. Effective home intervention programs must have clear models of behavioral change that both the home visitor and family can understand and embrace.

This study sough to improve these models by using a series of Content Acquisition Podcasts (CAPs) that focus specifically on enhancing language and literacy techniques (i.e., shared storybook reading and language interaction) in the home.

Content Acquisition Podcasts

In the study, the CAPs were used to develop clear behavioral models of change within a family's home literacy practices and environment. CAPs are multimedia-based

instructional modules created by Kennedy (2010), using Mayer's cognitive theory of multimedia learning [CTML], (2001, 2005, 2009). This learning theory relates to specific cognitive processing issues, stating that a person can learn better when he is able to pay attention to and organize words and graphics in working memory while also relating these ideas to his long-term memory (Mayer & Johnson, 2008). In other words, Mayer's model seeks to limit cognitive load while also maximizing human capacity to learn through visual and auditory channels.

CAPs are an extension of Mayer's learning theory and have shown success in promoting learning for undergraduate teacher candidates (e.g., Kennedy, Hart, & Kellams, 2010; Kennedy et al., 2012; Kennedy, Driver, Pullen, Ely, & Cole, 2013; Kennedy, Lloyd, Cole, & Ely, in press) and adolescents with and without a learning disability (Kennedy, 2010). Research shows that CAPs can successfully maximize student learning and retention in college courses that must cover a significant amount of content in a short amount of time.

Evidence suggests that home literacy programs also have a need to maximize learning with few resources, time or money. Studies indicate that family literacy interventions often fail because they are expensive, time consuming, complex, and require too much from already stressed family members (e.g., Bryant & Wasik, 2004; Old & Kitzman, 1993; Wasik & Roberts, 1994). The current study used CAPs to eliminate some of these issues. The CAPs were created by the researcher and included clear and concise modules that sought to enhance a parent's early literacy knowledge and skill. The CAPs content included evidenced-based research on early language and literacy techniques and strategies. The enhanced podcasts also provided examples of

behavioral change that families could both understand and embrace. In addition, CAPs are time and cost effective and can be viewed multiple times from any type of media tool (i.e.; IPod, Computer, DVD player).

In other words, this single-subject multiple baseline study explored the use of a literacy intervention using CAPs to improve home language and literacy knowledge and skill of parents with children who have or at-risk for a reading disability. Parents viewed a series of five CAPs, all related to shared storybook reading and parent-child language interaction. Parents were asked to incorporate the learned activities into their daily parent-child interactions. Parents were asked to record twelve hours of their own parent-child interactions two times each week using a digital language processor (DLP) and the Language Environment Analysis System (LENA) software system. Parents were also asked to engage in a shared storybook reading interactions on both of these days using the provided weekly book. In addition, the researcher conducted one in-person observation of the parent-child shared storybook reading interaction each week. This ensured that at least three shared storybook interactions occurred each week.

CHAPTER II

LITERATURE REVIEW

Reading Disability

Before discussing research on the risk factors that lead to reading difficulties in children, it is important to understand the theories and beliefs behind the definition of a "reading disability". As in many fields of research, there are different views of what constitutes a reading disability.

Historically, reading difficulties have been defined using a categorical approach that includes two types. The first type is when a reading disability, also called "dyslexia", is thought to be either a condition that a child has or does not have (Snow, Burns, and Griffin, 1998). Researchers believed that the condition has either biological or genetic roots and that it does not change over time. Using the IQ discrepancy model, a child whose aptitude is significantly different from his or her achievement often identifies dyslexia. In this model, readers who did not fit the IQ discrepancy criteria were considered to have a different type of reading difficulty, often referred to as the "garden-variety" type (or everything else). It is thought that this type stems from a variety of possible causes that include: poor classroom instruction, low intelligence, and weak motivation (Snow, Burns, & Griffin, 1998). The fear with this model is that the arbitrary cutoffs underestimate the number of children having difficulties in reading because it ignores students that just miss either side of the cutoff (Shaywitz et al., 1992).

More recently, researchers have challenged the categorical model citing a lack of evidence for qualitative differences between poor readers and those identified as having dyslexia (Snow, Burns, & Griffin, 1998). In addition, other studies indicate that there are

no true genetic differences between the two categories of reading disabilities, including data that shows when large representative samples are used in studies, even the gender difference gap fades away (e.g., Flynn & Rahbar, 1994; Shaywitz et al, 1992). These findings have led to a shift in views and the creation of a "dimensional" model of reading achievement (Snow, Burns, & Griffin, 1998). It is important to note that this model has been embraced by many researchers, but not by *all* educators (Shaywitz et al., 1992). This model views reading achievement on a continuum. Like the categorical model, the dimensional model assumes that biological, cognitive, and instructional factors influence a child's reading ability. However, unlike the categorical model, researchers who adopt this view believe that these factors can influence differences along the entire continuum of reading. Thus, there is no exact cutoff point or score that distinguishes a child with a reading disability. This means that a child that misses the cutoff by a few points is not immediately labeled as either a normal reader or reading disabled based on a single score. Instead this view helps educators meet the needs of children that have similar abilities, without having to worry about which side of the cutoff they fell on. In this model, a reading disability can be defined as any child that falls in the lower tail of the continuum or normal distribution of reading disabilities.

In order to serve children with reading disabilities, they must be identified at a young age so that interventions can be offered immediately. Under-identification of reading disabilities leads to an increase of children that are not receiving these crucial interventions. Therefore, it is also important to look at predictors of both reading failure and success, to help practitioners identify children before formal schooling. These predictors are often called risk factors.

Risk Factors

Reading problems are found among every group of children in almost every classroom in the United States; however, there are some children who have demographic characteristics that make them at greater risk for reading difficulties than others. There are many reasons that might lead to a child's failure to learn to read, researchers have used large-scale epidemiological studies to determine the prevalence, characteristics, persistence, and outcomes of individuals who have been identified as having reading disabilities or difficulties (e.g., Catts, Fey, & Tomblin, 1997; Ferrer, Shaywitz, Bennet, Holahan, Marchione, Karen, Shaywitz, 2010; Rutter & Yule, 1975; Rodgers, 1983; Shaywitz, Shaywitz, Fletcher, & Escobar, 1990; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992). These studies allowed researchers to examine patterns over time and help to gain insight as to how risk factors relate to outcomes.

While these large-scale studies provide valuable information about reading predictors, it is important to note that these risk factors are still *only* predictors and should not be considered direct causes of reading difficulty. This means there are often other variables that are not measured in particular studies that also contribute to the reading difficulty. When gathering research, the strength of the relationship, or correlation, between a predictor and an outcome should be considered. There are a vast array of risk factors associated with reading delays and disabilities. As previously mentioned, there are a variety of risk factors that can be categorized into three main groups: 1) child-based, 2) family-based, and 3) community-based. Research in each of these areas is described below.

Child-based risk factors. There are many different risk factors related to children

and their reading development. These risk factors include physical and clinical conditions like, cognitive delays, hearing impairments, attention deficit/hyperactivity disorder (ADHD), and specific early language impairments. These factors are usually considered to be medical or genetic conditions; however, there are also child-based factors that are described as developmental conditions. These conditions include acquired language proficiency and acquired knowledge of literacy (Snow, Burns, Griffin, 1998). Acquired language proficiency includes issues with verbal memory, lexical and syntactical skills, language development, and phonological awareness. Acquired knowledge of literacy includes issues with reading readiness, letter identification, and concepts of print. These developmental conditions in language and linguistic growth for children are broad and encompass many specific predictors of reading success.

All of these developmental skills encompass what is known as emergent literacy. The study of emergent literacy has grown rapidly over the last three decades. Changes in the lives of families and the increasing complexity of socioeconomic and sociocultural factors have led researchers to ask questions about the differences in home literacy environments and how they impact emergent literacy. Emergent literacy is defined as the skills, knowledge, and attitudes that develop before a child learns to read and write (e.g., Sulzby & Teale, 1991; Teale & Sulzby, 1989) and the environments that support their literacy development (e.g., shared storybook reading; Lonigan, 1994; Whitehurst et al., 1988).

The term derived from Marie Clay's (1993) observational study of children's reading behavior; recognizing, that the early reading skills of children preschool are influenced by family literacy interactions and the environment at home. Emergent

literacy is sometimes referred to as *early literacy* (Neuman & Dickinson, 2001). The idea of emergent literacy involves the view that children acquire literacy on a developmental continuum, which starts as early as birth. This means that there is no distinct boundary between "pre-reading" and "real" reading behaviors of children and from this perspective the literacy behaviors that are introduced in the preschool (meaning before formal schooling) years are highly influential and important (Whitehurst & Lonigan, 1998). In addition, the emergent literacy perspective assumes that reading, writing, and oral language develop together, in both home and social contexts. Other perspectives of reading often focus on "reading readiness" skills that a child must master before formal reading instruction and treat writing as a secondary component (Whitehurst and Lonigan, 1998). In general, the concept of literacy development is broad and various perspectives exist across the field. Recently, the term emergent literacy has also expanded and includes a variety of different environments through which a symbolic system might exist (i.e., map, grocery coupons) (Whitehurst & Lonigan, 1998).

Both quantitative and qualitative research exists to help explain the concept of emergent literacy. The quantitative research typically explains relationships between pre-literacy skills and a child's conventional literacy abilities, while the qualitative research helps explain the development and behaviors of children in response to early literacy tasks and interventions (Lonigan & Whitehurst, 1998).

In a literature review of emergent literacy research Lonigan and Whitehurst (1998) discovered that research in this field is often unique because it focuses on different components and forms of emergent literacy skills. To make this research easier to understand the authors broke emergent literacy into components that help one capture the

different measures that often exist within emergent literacy studies. The components include: early language acquisition, acquired knowledge of literacy, emergent reading, and emergent writing.

For this study, I designed an intervention that focused on a dialogic shared storybook intervention and the enhancement of parent-child language interactions. The child-based risk factors that are closely associated with these interventions are acquired language proficiency and acquired literacy knowledge.

Acquired language proficiency. Language is defined as a child's semantic, syntactic, and conceptual knowledge and is often measured using the PPVT-R (Dunn & Dunn, 1981), EOWPVT-R (Gardner, 1990); Reynell Developmental Language Scales (Reynell, 1985), or the CELF-Preschool (Wiig, Secord, & Semel, 1992). Language is an important component of emergent literacy skills because reading deals with translating visual codes into meaningful language (Lonigan & Whitehurst, 1998). In addition, vocabulary acquisition is related to a child's language use, as exposure and vocabulary knowledge help at different points in a child's reading development. The meanings of words are crucial to a child's understanding of literature. For example, if a child has no knowledge of a "*play"* (meaning: performance with actors) and an entire storybook is about going to see a play at school, it may be very difficult for a child to understand the storyline and other vocabulary words that are associated with the book. Another major finding in the area of early literacy and language research is that a child's early ability to make connections between reading and language relates to later reading proficiency in both typically developing children and those with reading and language delays.

In a longitudinal study, Bishop and Adams (1990) assessed the language and

literacy skills of 83 eight and one half year old children who had first been assessed at the age of 3:9 or 4:2 years old because of language impairments. The children in the study had language impairments that were not attributed to low intelligence, hearing loss, physical defect, or bilingual language development. The researchers found no deficits present, if the language problems had been resolved by age five and one half years old and their literacy development at age eight and one half was normal; however, if their language difficulties had not been resolved by age and five and one half, they continued to have verbal deficits and reading delays at age eight and one half years old. Specifically, these children had problems with reading comprehension and reading accuracy. Their data suggests that the time period of early literacy is crucial and that language development relates to future reading achievement.

Rescorla (2009) found a similar relationship in her study with 17 year olds that were late-talking toddlers. The toddlers were identified as late talkers at 24-31 months. About half of the sample of children (26) had normal nonverbal ability and normal receptive language at intake while 23 others were typically developing children and used as a comparison group and matched on age, SES, and nonverbal ability. At 17 years old the children were assessed and results indicated that although the late talkers scored in the average range on all language and reading tasks they obtained significantly lower Vocabulary/Grammar and Verbal Memory factor scores than the their control group peers. The Vocabulary/Grammar scores consisted of scores from the Vocabulary subtest of the Wechsler Adult Intelligence Scale-Third Edition (WAIS-III; Wechsler, 1997) and the Syntax Construction, Sentence Comprehension, Grammatical Judgment, and Ambiguous Sentences subtests of the Comprehensive Assessment of Spoken language

(CASL; Carrow-Woolfolk, 1999). The Verbal Memory factor score consisted of the Digit Span subtest of the WAIS-III and the Logical Memory and Verbal Paired Associate subtests of the Wechsler Memory Scale-Third Edition (WMS-III; Wechsler, 1997). Conclusions from this study show that while young children with language delays do not always have language impairments in adolescence, they do have language and reading deficits when compared with their typically developing peers.

Scarborough and Dobrich (1990) compared a control group of 12 children to four children with early language delays (ELD), looking at their preschool language abilities from age two and one half to five years of age and then their verbal skills at the end of second grade. They found that over time the children with language delays improved as their language became normal or close to normal by the time they were five years old. However, when they followed up a few years later in second grade they discovered that three of the four children with language delays had reading disabilities, again showing that there is a relationship between language acquisition and future reading achievement.

Shapiro et al. (1990) studied the early language and motor development of 240 children from the time they were babies until the age of seven and one half years old using data from their well child visits. At age seven and one half, the researchers administered the Woodcock-Johnson Psychoeducational Battery and classified children whose composite score was six months behind their chronological age as being reading impaired. Medical records were then examined and regression and discriminant analyses were used to evaluate how the children's developmental characteristics as infants contributed to later reading achievement. Results for the receptive language gradient looked at the following milestones: social smile, ability to orient to one's voice, gesture

games, one-step commands with a gesture, one-step commands without a gesture, and the naming of five body parts. The expressive language gradient looked at the child's first sounds, first words, four to six word vocabulary, seven to 20 word vocabulary, mature jargon, two-word combinations, 50 word vocabulary, and two-word sentences. Results indicated that the expressive language milestones of four to five words, seven to 20 words, 50 words, and two-word sentences showed significant differences ($p < .05$) in age of attainment for children with and without reading delays. The receptive milestone of pointing to five body parts showed statistically significant differences ($p < .05$) between those children with and without reading delays. A composite measure of infant achievement predicted reading status (disability or no disability) with .73 sensitivity and .74 specificity. Overall, this study suggests that expressive language milestones are more predictive of future reading success than receptive language milestones.

Walker, Greenwood, Hart, and Carta (1994) followed 29 children between the ages of five and 10 years old over the course of kindergarten through third grade. In both the fall and spring, students were assessed using The Wide Range Achievement Test (WRAT-R; Jastak & Wilkinson, 1984), Metropolitan Achievement Test (MAT; Prescott, Balow, Hogan, & Farr, 1984) (only in kindergarten), and the Comprehensive Test of Basic Skills (CTBS, 1987, 3d ed.) (in grades 1-3). In addition, students were given the Otis-Lennon School Abilities Test (OLSAT) (Otis & Lennon, 1989, 6th ed.) each spring to assess student verbal and nonverbal ability. The Peabody Picture Vocabulary Test-Revised (PPVT) (Dunn & Dunn, 1981) was used to assess students' receptive vocabulary. Correlation matrices were used to analyze the data and hierarchical regression was used to predict relationships. SES was used as a composite indicator and

results suggest that early language production significantly increases the variance accounted for, for the prediction of elementary language and academic competencies.

Overall, these studies suggest that there is indeed an important relationship between language and reading and show that they have much in common. The studies focus on children at different ages and use different predictors (i.e., ELD, mean length of utterance, phonological awareness, and vocabulary), suggesting that language development is a central component of children's future reading achievement.

Acquired literacy knowledge. Before children learn to read they have acquired some information about the task of reading. However, some children have limited opportunities to acquire this knowledge before entering formal schooling. Some children may enter kindergarten knowing their entire alphabet and have the skills needed to sound out words in print, while others may not even have the knowledge of how to hold a book. Research in this area looks at how a child's knowledge of letters, print, and basic book mechanics predict future reading achievement.

Scarborough (1998) looked at a longitudinal sample of 78 children in second grade that were followed since age two. Sixty-four of the children were directly tested again in second grade, of this group 31 were originally labeled as at-risk and 35 were not at risk at age two. The remaining 12 (three at-risk, nine typically developing) were unavailable for direct testing so parents and schools provided current performance information. Six years later, 68 of the second grade sample were again located. Sixty-four of these students were directly tested and the other four declined further participation. At second and eighth grade student scores were obtained using the word identification, word attack, and passage comprehension subtests of the Woodcock-Johnson Psychoeducational Battery

(1978). These scores were averaged using the Rasch-scaled W scores and then analyzed. Spelling and phonological awareness were also measured using a nonstandardized spelling dictation and a phoneme deletion task. Verbal memory and rapid serial naming tasks were also given to each student. Arc sine transformations were applied to the scores to account for distributional irregularities. Pearson correlations among the measures at each grade were determined to take socioeconomic status (SES) and other factors into account. Results from the study indicated that the phonemic awareness, verbal memory, and rapid serial naming speed are associated with a student's reading abilities at both second and eighth grade. These findings suggest that the acquired literacy skill of letter naming and general reading readiness may serve as good predictors of future reading achievement.

Using another longitudinal sample, Scanlon and Velluntino (1996) studied 1,407 children in kindergarten classroom located in upper-middle class neighborhoods. All students were given a comprehensive kindergarten assessment battery, which measures the following: skills and abilities (in general), linguistic ability, memory, conceptual ability, reading, and math. During the fall of first grade these students were assessed again on reading as their classroom teachers were asked to rate their reading progress on a scale of 1 to 5 (1 being extreme difficulty and 5 being progressing extremely well). In addition, they were reassessed using the Word Identification and Word Attack subtest of the Woodcock Reading Mastery Test-Revised (Woodcock, 1987). Classroom observations were also conducted every six to eight weeks throughout the school year. Stepwise multiple regression analyses were performed, using the group of predictor variables to predict reading performance at the end of first grade. Results indicated that a

child's ability to name letters in kindergarten was the strongest predictor of first grade reading achievement, showing that approximately 82 percent of grade one outcomes of the participants were correctly predicted. The researchers also found that measures of linguistic processing skills (i.e. phonological processing) accounted for the largest proportion of variance in first grade reading. These findings are important because they suggest that it is possible to identify children who are at-risk for reading failure shortly after they enter kindergarten by testing their acquired literacy knowledge (i.e., letter naming and phonological awareness).

Smith (1996) randomly recruited a sample of 64 children using the class lists of six different preschools in a mid-size mid-western city. She tested the students using eight informal measures within the first four weeks of preschool. In addition, she surveyed the parents to assess the frequency and type of literacy practices that occurred in the home with their children. Five years later she located 57 of the original participants and used their scores on the Iowa Tests of Basic Skills to determine their level of academic achievement. Results showed that almost all of the four year olds who entered preschool with advance knowledge about print and who had rich literacy experience at home were good readers, while the children that had little knowledge or experience with literacy prior to preschool struggled on the standardized measures five years later. Furthermore, about three-fourths of the preschoolers with scores in the lowest quartiles showed unsatisfactory performance in reading five years later (in third grade). This study focuses on the importance of acquired book knowledge and shows how it can relate to school outcomes.

Neuman and Roskos (1997) worked with 30 preschoolers from a collaborative

state-funded multicultural preschool project in Massachusetts and a federally funded Even Start program. The families were diverse and most lived in a low- to middle income communities. The program was designed for children from non-English speaking or bilingual homes and/or low-income families. Peabody Picture Vocabulary Test (PPVT) scores were obtained for all of the children and the preschool program environments were examined for literacy opportunities. During the intervention phase data was collected over a seven-month period via observation, videotape, and weekly informal conversations with the teachers and specialists. All of the preschoolers were observed once per week during this period. The object of this data collection was to examine the literacy knowledge of young children through play activities that were designed to reflect a child's real-world environment (e.g., post-office, restaurant, doctor's office). The researchers used a constant-comparative approach to analyze the data and results indicated that in the context of play children could demonstrate declarative knowledge about literacy (e.g., naming literacy objects), procedural knowledge (e.g. routines), and strategic knowledge (e.g., metacognition). The results suggest that a child's early literacy experiences and activities at home and in the community play an important role in a child's literacy knowledge.

Bryant, Bradley, Maclean, and Crossland (1989) examined longitudinal data of 64 children from the age of 3:4 to 6:3 years and tested the relationship between early knowledge of nursery rhymes and future success in reading and spelling development taking the differences in social background, IQ, and children's phonological skills into account. The results indicate that there is link between children's knowledge of nursery rhymes enhances children's phonological sensitivity, which then affects their future

reading achievement.

In a similar study, Bryant, Bradley, Maclean, and Crossland (1990) looked at how children's rhyming skills, alliteration abilities, and ability to detect phonemes (all aspects of phonological awareness) related to reading achievement. Again the results came from a longitudinal study in which 65 children were studied from the age of four years to six years old. The children were tested over this time period in four different sessions. To test the children's rhyme and alliteration skills a rhyme-oddity task was used in which children were given three words with pictures, two of which rhymed and one that did not. The children were also asked to determine which one of three words began with a different sound. Phoneme detection was studied using a phoneme deletion and phoneme tapping tasks. Regression analyses suggest that the rhyme oddity task and the joint rhyme/alliteration tasks predict children's future reading and spelling ability ($p < .001$). In addition, all three phoneme-detection tests were significantly related to the reading measures and two of them (first-phoneme deletion and phoneme tapping) were also significantly related to the spelling measure.

Overall, these studies show that a child can acquire literacy in different ways and that this acquisition of knowledge is related to his or her future literacy success. The aforementioned research also indicates that children come to school with varying degrees of acquired literacy knowledge. Showing, that although we have the ability to determine who is at-risk for reading failure at an early age (Scanlon and Velluntino, 1996), the gap is often too large to close within the formal schooling years. This once again, reiterates the need for early home intervention programs that focus on enhancing a child's acquire literacy knowledge before school.

Family-based risk factors. A child's family history, home literacy environment, verbal interactions, and socioeconomic status are factors that also relate to a child's risk for reading delay or disability. These factors sometimes relate to the research mentioned above, as their family and life at home often influence a child's acquired knowledge and language acquisition.

Family history. There is research that suggests that a child who has a parent or older sibling that has a reading problem is at a greater risk for having a reading disability. Defries and Alarcon (1996) examined results from the Colorado Twin Study of Reading Disability and used multiple regression analysis on a sample of 186 pairs of identical twins and 138 same-sex fraternal twins to determine that there is indeed a link between reading disability and genetics. Their results showed that on average over half of those with reading difficulties can be attributed to genetics. However, they were unable to determine the exact chromosomal locations for the deficits, instead labeling reading disability as genetically heterogeneous.

Volger, DeFries, and Decker (1985) looked at the self-reported reading ability of 174 parents of children with a reading disability and 182 control families. The researchers then used this data to predict the probability that a child will have a reading disability given their parent's disability. They found a significant relationship between the two variables using Bayesian inverse probability analysis and discovered that a child's risk for reading disability increase significantly (by a factor from about four to 13) if either parent has reading difficulties.

Home literacy environment. In 1984, Hess and Holloway studied ways in which the home literacy environment and overall function of the family influences a child's

reading development. They discovered that book reading with children, existing home literacy materials, parental expectations of achievement, verbal interactions, and parent value of literacy all impact a child's reading development.

Payne, Whitehurst, Grover, and Angell (1994) studied the role of the home literacy environment on the developmental language ability of low-income preschool children. In particular, the researchers looked at the frequency of shared picture book reading between children and their primary caregivers. The researchers examined different aspects of the shared reading experience, including the child's age when the activity began and the duration of the shared experience. Results from the study suggest that the home literacy environment and shared reading experience positively influence language and literacy development in children and enhance their reading enjoyment.

In 1999, Karen Rush examined the home environments of a group of low-income children enrolled in Head Start. The study focused on caregiver-child interactions observed in the home. Rush (1999) observed and reported on the rate of literacy activities in the home and found that caregiver involvement, rate of language interactions, and participation in these early literacy activities are closely related to future language and literacy skills.

Weigel, Martin, and Bennett (2006) used structural path models to study specific components of the home literacy environment. The researchers collected data from 85 parents and their children using questionnaires about parental literacy habits, parental reading beliefs, and parent-child activities. Results found that a) parental literacy habits were positively associated to their beliefs, b) parental reading beliefs were positively associated with parent-child literacy activities in the home, and c) parent-child literacy

activities were positively related to children's print knowledge and reading interest.

Phillips and Lonigan (2009) collected home literacy surveys from the primary caregiver of 1,044 two to five year old children from all different SES backgrounds. The home literacy questionnaire included questions about the home situation (e.g., income, caregiver education, and the presence of other children or adults in the home) and the home literacy activities (e.g., frequency of shared reading, literacy teaching, library visits, television watching, and child interests). Hierarchical cluster analyses revealed that a three-cluster solution best fit the data. Clusters differed on frequency of shared reading and literacy teaching activities. The caregivers scored either low or high on *all* behaviors or low on shared reading but high on literacy teaching behaviors. The relationships between the clusters were significantly related to SES, family living conditions, caregiver stress, and caregiver reading ability, thus suggesting that home literacy environments are affected by knowledge, resources, and parental beliefs.

In 2005, Roberts, Jurgens, and Burchinal studied maternal sensitivity; along with, shared book reading frequency, enjoyment of reading, and maternal book reading strategies in the homes of 72 preschool-aged African American children from low-income families. These children's home literacy environments had been followed since infancy using the HOME assessment, a 45-item semi-structured observation/interview that measures the overall responsiveness of the home environment. Roberts et al. (2005) found moderate to large correlations between all four home literacy practices but only a few significant associations with language and literacy outcomes. Instead the HOME assessment was the most consistent and strongest predictor of children's language and literacy skills. While Roberts et al. (2005) did not find strong associations between the

specific home literacy practices and future literacy outcomes, other researchers have found that there is a relationship between specific home literacy practices and literacy skills (e.g., Scarborough & Dobrich, 1994; Landry et al., 2000). Roberts et al. (2005) suggests that the inconsistency in research on specific home literacy practices may have to do with the complexities of both emergent literacy and the home environment.

The research mentioned above and that of others (e.g., Schieffelin & Cochran-Smith, 1984; Snow, 1987; Taylor & Dorsey-Gaines, 1988) clearly links these important emergent literacy skills with the quality of home literacy environments. These findings have led policymakers, researchers, and teachers to create home intervention programs that focus on improving children's home literacy environments.

Language interactions. The most common measure of verbal interactions in the home deals with the quantity of interactions. Research shows that poor and uneducated families provide similar language experiences as middle-class families but that the quantity of interaction is much less.

Hart and Risley's (1995) longitudinal study on the relationship between home and family on children's language and word learning studied the vocabularies of 42 children from they time they first began to talk (around one year) until they were approximately three years old. They found that the quantity of verbal interaction in the homes of poor and uneducated families is much less than the interactions found in middle-class educated families. The research suggests that this low quantity of verbal interaction correlates with lower vocabulary scores. This is important because vocabulary scores are related to reading outcomes, which indicates that having low levels of verbal interactions in the home leads to greater risk for reading delay or disability. In addition, Hart and Risley

(1995) found that the relationship between verbal interaction and vocabulary means that this risk factor sometimes does not show up until later in the primary grades when vocabulary is required for higher-level comprehension skills. Like other studies, Hart and Risley discovered that the SES of families is another major factor in determining a child's ability to acquire language and vocabulary.

Whitehurst et al. (1988) compared the verbal interactions in the homes of 28-month old children with expressive language disorder (ELD), 28-month old normal children that had the same receptive ability of the ELD children, and 17-month old normal children with the same expressive ability as the ELD children. A total of 41 children and their families were studied; all were White middle-class intact families in Long Island, New York. The families were all given audio tape recorders, tapes, and instructions that asked them to tape their family interactions at least four days a week during dinnertime. A total of four hours of tape were recorded for each family and the meals that occurred during the second and third hour of taping were analyzed. The researchers measured maternal mean length of utterance, intervals of silence (SIL), and total parent behavior (TOT). There were 17 behavior categories in the observation code (e.g., correction, wh-questions, praise, answer). MANOVAs indicated significant differences in the frequency of child and parent behaviors between the ELD group and the receptive/chronological-age control group, as the researchers found that parents in the ELD group produced more labels, gave fewer answers, had less silences, provided more imitative directives, and had more total speech than parents in the receptive/chronological age group. However, MANOVAs indicate that parent and child frequency variables did not differ significantly between the ELD group and the 17-month old expressive group.

The most apparent single difference between the ELD group and the two control groups was that ELD parents used more imitative directives. Overall findings show that in middle class families, parents of children with ELD and younger children spend more time than parents of older typically developing children at non-contingent attempts to teach vocabulary, showing that parents talk to children with limited speech differently than children with more mature expressive skills.

Socioeconomic status. In educational studies, SES of families is often recorded using household income, parents' education and occupation, and the socioeconomic level of a child's school or school district (Snow, Burns, Griffin, 1998). This formula means that families who have a low SES are less educated and live in communities where nutrition and health services are less adequate, including prenatal and pediatric care. The low SES leads to a wide variety of risk factors that effect the development of children living in these communities, including reading development. It is extremely hard to determine exactly which factors among the low SES categories directly relate to reading difficulties, however; there are studies that, like Hart and Risley (1995) that show links between SES factors and reading development.

White (1982) used meta-analytic techniques to study the correlation between SES and academic achievement. Noting that the weak and moderate correlations that are often reported between these two items, he analyzed 101 studies looking at the relationship between SES and achievement. In his meta-analyses he found that SES is weakly correlated (r=.22) with academic achievement. However, he found that using aggregated units of analysis (rather than individual student analysis) made the correlation of SES and academic achievement jump to .73. This shows that is important to look at

SES as a unit of group analysis rather than at the individual child level because it is complex and involves many factors.

Pungello, Kupersmidt, & Burchinal (1996) followed 1,253 children for 2-4 years, tracking their achievement in elementary and middle school. They used the multiplicative risk factor model and the cumulative risk model to study the effects of low SES and stressful life events on both math and reading achievement. These two models are part of the hierarchical linear model (HLM) approach and allow the researcher to examine individual patterns of development and differences. When looking at reading achievement scores using the multiplicative risk factor they found that children living in low SES homes obtained lower reading scores than those living in higher SES homes, with a significant main effect of $F(1, 3388) = 134.58$, $p < .0001$). When using the cumulative risk model Pungello et al. (1996) again found a significant main effect for the reading achievement variable, $F(3, 3387) = 127.10$, $p < .0001$.

In 2006, Roel van Steensel tried to understand some of these intricacies by studying the relationships among sociocultural factors, the home literacy environment, and children's literacy development. In his study, van Steensel (2006) identified three different home literacy profiles (rich, child-directed, and poor home literacy environment) and recruited 116 children and their parents to participate in a survey study. He used a home literacy questionnaire consisting of information about the literacy activities of family members and information about joint literacy activities involving each child. He related the profiles to the ethnicity and SES of each family and found that children from the high SES category had the most stimulating home literacy environment. He found that most ethnic minority families have child-directed home

literacy environments. Roel van Steensel (2006) also discovered that as parent education level increases, the share of families with rich home literacy environments also increases. The percentage of families that fell into child-directed home literacy environments was comparable in all three educational levels; suggesting that in every SES group there are parents who value literacy for their children, even if they do not value it for themselves. After controlling for background characteristics he concluded that the home literacy environment has an effect on children's future reading achievement scores in the first and second grade.

Community-based risk factors. A child's neighborhood, cultural and economic community, and school district are all important factors when studying risk for reading difficulty. As mentioned above, family-based factors (especially SES) are difficult to tease apart, therefore, some studies have focused on school-based factors.

One of the largest longitudinal studies dealing with reading achievement and school based factors is called the Louisiana School Effectiveness Study (Stringfield & Teddlie, 1998, 1991; Teddlie & Stringfield, 1993).

Stringfield and Teddlie (1987) used data from the Louisiana School Effectiveness Study to examine 76 elementary schools in a three phase process that consisted of a (1) pilot study, (2) data-gathering phase with a stratified sample, and (3) detailed analysis of eight matched pairs of schools. Their results suggest that there are many factors that determine the effectiveness of a school; including the school climate, focus of leaders, student variance, and teacher behavior. The results also suggest that a system within a school can have a significant impact on the schools effectiveness and in turn a students' success.

In another study, Teddlie, Kirby, and Stringfield (1989) found that classrooms in ineffective schools led to less on task student behavior, less presentation of new material, lower teacher expectations, fewer instances of positive teacher support, frequent classroom interruptions, increased discipline problems, and low positive classroom climate. These findings suggest that students in these schools will learn less each year and are more likely to fall behind, indicating a greater risk for reading difficulty.

Summary of Risk Factors

Snow, Burns, and Griffin (1998) point out that we must be cautious when looking at risk factors or predictors of reading delays or disability. The previously mentioned studies clearly show that there are relationships between risk factors and reading achievement, but these correlations must be interpreted carefully, as they are not all causal relationships. When reviewing these studies it is clear that there is no single factor that can predict risk for reading disability on its own. However, when we examine and think about the individual, familial, and community-based factors combined, we can make successful and valuable predictions of future reading achievement in children.

The factors that do contribute to a child's reading success or failure are often comorbid and may occur at different points in a child's life. The current study focused on children who have not yet entered formal schooling and their families. Therefore, it is important to understand research on multiple factors, as it provides evidence of the need for early family literacy interventions. In addition, it offers insight into the theory behind the current intervention study.

Home Literacy Programs

Home-visiting programs multiplied throughout the United States in the 1980s and

1990s (Bryant & Wasik, 2004). Home intervention plans are family-focused and help build trust between the visitor and parent. Home visits can promote both adult and child literacy and help provide a better understanding of the family's home literacy environment. Home literacy interventions can increase the quality and quantity of the physical, social, and symbolic resources in the home.

Carter, Chard, and Pool (2009) took a family strengths approach to early language and literacy development by creating guidelines and tools for helping families create language and literacy opportunities in their home environment. They suggest that modeling reading and language, increasing interactions with children, enhancing literacy opportunities, and recognizing the importance and value of literacy can improve both literacy skills (e.g., oral language, vocabulary growth, print awareness, letter knowledge) and literacy beliefs (e.g., shared enjoyment of literacy, positive attitudes toward literacy).

In a recent review of parent language and literacy intervention programs for preschool children, Reese, Sparks, and Leyva (2010) looked at experimental studies that used various intervention and training techniques over different periods of time. Conclusions from their review suggest that three types of parent-training methods effectively improve early language and literacy skills of young children. These interventions include the methods of shared-book reading, conversations, and writing interactions. When parents were trained to use these activities in the home, children's vocabulary, story telling, and writing skills improve.

Home literacy models. Three of the most widely used and well-known home literacy programs use some of the above methods. The intervention programs are the Parent as Teachers (PAT) model, the Even Start family literacy program (Bryant &

Wasik, 2004), and Early Head Start.

PAT model. The PAT model began in 1981 and currently serves about 300,000 children in over 3,000 programs. The PAT model consists of four components: personal visits, group meetings, screening, and a resource network. PAT is not strictly a literacy program but has the philosophy that parents can serve as teachers if they become more aware of and involved in the home literacy environments of their children.

Even start model. The Even Start program integrates early childhood education for low-income children and their caregivers. In 2000-2001, Even Start served approximately 32,000 families with $150 million in funding. The next year the budget for Even Start increased to $250 million (U.S. Department of Education, 2003). Even Start involves early childhood education, parenting education, adult education, and parent-child joint literacy activity components. It consists of center and home-based intervention. Both PAT and Even Start focus on home literacy environments along with other aspects of emergent literacy development.

Early head start model. Early Head Start (EHS) is a community-based program for low-income families with young children. EHS deals with both prenatal and early childhood development as it strives to: 1) promote healthy prenatal outcomes for pregnant women, 2) enhance the development of very young children, and 3) promote healthy family functioning (Early Head Start National Resource Center (EHS-NRC, 2013).

These federally funded programs have served many families, but there are still many families that would benefit from intervention programs. There are also issues that arise when implementing these interventions, which might change the effectiveness of a

program.

Home Literacy Interventions

Home-based intervention programs often have implementation problems because they require substantial money, organization, and resources. Bryant and Wasik (2004) explain that home intervention programs often face these difficulties because they fail to consider the training and supervision of the home visitors. They suggest that effective home intervention programs must have clear models of behavioral change that both the home visitor and family understand and embrace. Visitors must have extensive and appropriate training in order to successfully engage families. The visitors must possess relationship-building skills, be knowledgeable of adult learners, and possess innovative problem-solving skills. The home visitor must help the family understand how the home literacy environment can affect the literacy outcomes of their children.

Wasik and Roberts (1994) found that only 40% of home visiting programs require visitors to have a bachelor's degree. Olds and Kitzman (1993) found that only six of 15 home literacy programs showed significant benefits for children. In 1999, Gomby, Culross, & Behrman reviewed six home-based intervention programs and found that their benefits were limited as well.

Do these issues and the research findings indicate that parenting behaviors and home environments cannot be changed in ways to show significant and lasting effects? Bryant and Wasik (2004) would most likely answer 'no' to this question. Instead of believing that these home interventions are not effective, they would argue that researchers, policymakers, and program directors need to focus on four broad issues pertaining to home-based emergent literacy intervention programs: (1) staffing and

credentials of the staff, (2) training and supervision of the home visitors, (3) the intensity of services provided, and (4) identification of service populations. Staff members need to have proper educational backgrounds, and they must be able to connect with or relate to the families in some way. Factors such as culture and language must be considered when matching home visitors with families. Home visitors need training and continuous supervision to ensure reliability and fidelity of the interventions. The intensity of programs varies due to budget and family schedules.

Results from one PAT program showed more positive outcomes for families who received more visits. Federal programs like Even Start and PAT often require programs to serve the neediest families; however, it is difficult to truly determine who most deserves such services based on income or SES. Instead Wasik and Bryant (2004) suggest that interventions should focus on families that are ready and willing to learn and should reach out to many family types. The aforementioned risk factors can also be used to identify families in need of intervention.

Research indicates that there are a wide variety of interventions that occur in the home and some are more family focused than others. Shared storybook reading and the enhancement of parent-child language interactions are two family friendly interventions because they focus on increasing language and literacy throughout the family's daily routines.

Shared storybook interventions. As mentioned, the concept of shared storybook reading gained attention in the 1960s as scholars began to stress the importance of family book reading and the home environment, indicating that adult-child book interactions are important factors in early literacy development. The concept of shared storybook reading

was formally introduce in 1979 by Don Holdaway, when he began to build on research related to child's experiences with bedtime stories. He suggested that shared storybook reading interactions can begin starting at birth and allow a child to observe a parent or caregiver reading with both fluency and expression. This type of research increased in the 1980s, as several ethnographic studies gained the attention of policymakers in the government. The research began with several studies of literacy in the home, which then led to more quantitative research in this area.

In her book *Ways with Words: Language Life and Work in Communities and Classrooms,* Shirley Heath (1983), studied and lived with families in the Piedmont Carolinas from 1969-1978, conducting an ethnography and social history. She compared the communities of *Roadville* (white working-class), *Trackton* (black working-class), and *Townspeople* (mainstream black and whites). Heath collected field notes, identified patterns of communicative interactions, defined communication problems, and began to search for solutions during her time in the Carolinas. Her findings gained attention because she discovered that language development is often dependent upon the culture, roles, and social intricacies of communities. These qualitative findings were important because they (1) brought a new understanding to the need for educators to have cultural knowledge about their students and families and (2) suggested that family practices had a direct influence on children's future school reading achievement.

Taylor (1983) studied six families and focused on family interactions. She found that family literacy styles and values, the social organization of a family's life, the relationship between the adult and child awareness of written language, the culture, and approach to learning in school all influence the reading and writing activities that a child

experiences at home. This study was influential because it once again indicated that a child's book and literacy experiences at home are important aspects to future school success.

Taylor and Strickland (1986) used qualitative research to gather information from the experiences of families to show how shared storybook reading helps to promote language and literacy development. Their book contains stories and real-world experiences of parents and their children reading books together. It includes photographs, discusses reasons to read storybooks with children, discusses how to incorporate this type of reading into everyday family life, and gives suggestions of to find and choose appropriate books. It serves as a great hands-on learning tool for parents.

Cochran-Smith (1983) also reviewed studies on shared storybook reading and the role of literature in children's lives and found that the frequency and nature of parent-child shared storybook reading experiences affect future differences in children's academic achievement. Shared book reading exposes children to grammatical forms of written language and shows them discourse rules that are usually absent in conversations.

This initial research encouraged policymakers to take action and brought attention to national policies on reading development. *Becoming a Nation of Readers* became the major literacy policy in the U.S., as government programs encouraged Americans to value the virtue of family reading activities. This growth sparked new research as Whitehurst and colleagues coined the term *dialogic reading*.

Dialogic reading interventions. Dialogic reading is different from normal shared storybook reading because it shifts the role that an adult would normally play when reading a story to a child. The child is no longer only a listener and instead learns to take

part in the storytelling, the role typically held by the adult. This is a gradual shift and happens when the adult begins to ask the child questions about the story. In the beginning, these questions might require yes/no responses but as the child becomes more comfortable with his or her role the adult begins to ask more open-ended questions, becoming an active listener. During this process the adult also learns to prompt the child to expand on his or her answers so that descriptions are included. Whitehurst and colleagues created a line of dialogic book reading research, adding many new studies to the field.

Whitehurst et al. (1988) studied 29 children, with normal development and linguistic abilities, and their families. All of the children were between the age of 21 and 35 months and were from middle-class families in New York. The children were randomly assigned to either an experimental or control group. The Denver Developmental Screening Test (Frankenburg, Dodds, & Frandal, 1973) and the Early Language Milestones Scale (Coplan, 1982) were used as pretests. Following the pretests, the experimental group participated in a 4-week treatment program that instructed parents to alter their reading practices during story time with their child. The control families were asked to read to their children but were not instructed to change any of their behaviors. After the 4-week intervention, families returned for post testing. Results showed that participants in the experimental group were about 8.5 months ahead of those in the control group on the ITPA-VE ($p = .0005$) and six months ahead of those in the control group on the EOWPVT ($p = .009$), but not on the PPVT ($p = .495$). In addition, the researchers used the audiotapes to analyze the mean length of utterance (MLU), frequency of phrases, and frequency of single words of the participants. Like the

standardized test scores, the children in the experimental group performed higher on all of these measures.

In 1992, Valdez-Menchaca and Whitehurst expanded this dialogic book reading research to Mexican Day Care centers with 20 Mexican two year olds from low-income families. In the study, children were randomly assigned to either an intervention or control group. The intervention group consisted of being read to individually by a teacher using dialogic reading techniques. The children in the control group received individual arts and crafts instruction with the same teacher. All of the parents in the intervention were literate and all of the children were typically developing according to the Denver Developmental Screening Test (DDST, Frankenburg, Dodds, & Fandal, 1973). However, their linguistic abilities were low according to two standardized measures of vocabulary (i.e., PPVT-R, EOWPVT). It is important to note that both of these measures were translated into Spanish and that two items on the EOWPVT (pumpkin and chimney) were excluded because they are unfamiliar in the Mexican culture. The intervention occurred in a low quality daycare center, as determined by the Early Childhood Environment Rating Scale (Harms & Clifford, 1980), which showed that the only language-related literacy activity that occurred in the center was singing. The researchers provided five books for use in the experimental condition as well as puzzles, small coloring books, Play Doh, paper, crayons, scissors, and glue for the control group. An audiotape recorder was used to record the children's verbalizations so that their language could be assessed during book reading. Two-tailed *t* tests were used to analyze the children's standard scores for both the experimental and control group. Each of the analyses revealed a significant group effect which indicated that the children in the

experimental group outperformed those in the control group, $t(18) = 2.57$, $p = .019$, for the PPVT; $t(18) = 3.06$, $p = .007$, for EOWPVT, and $t(18) + 3.38$, $p = .003$ for ITPA. Cohen's d effect sizes were also large, $d = 1.3$ (PPVT-R), $d = 1.29$ (EOWPVT), and $d = 2.08$ for ITPA). An analysis of variance (ANOVA) was used to analyze the verbal production data. The results showed once again, that children in the experimental group produced a significantly greater number of utterances than children in the control group, $F(1, 18) = 4.7$, $p < .001$. This study is important because it shows that Whitehurst et al.'s (1988) research can also extend to children who are not native English speakers, showing once again that shared-story book reading effects *all* children's language development.

Arnold, Lonigan, Whitehurst, and Epstein (1994) taught 64 mothers how to use dialogic reading techniques with their preschool children (24 months to 34 months). Unlike many studies, all of the children had average or above average expressive and receptive language skills and were from middle- to upper-SES homes. The children and their mothers were randomly assigned to one of the following groups: a direct training condition, a video training condition, or a control group. Families were asked to come to a university laboratory for all testing and training. Pretests included the Reynell and the PPVT-R, after pretesting the mothers were asked to read with their children, without any specific instructions, at least four times throughout the course of a week. After this week parents in the book reading conditions were trained for four weeks using the direct training or the videotape method. Both groups were given written instructions on the dialogic reading method. After the four-week intervention children's language skills were reevaluated. Covariate-adjusted comparisons were used to compare the video and the control group and results showed that the video group outperformed the control group on

the EOWPVT and the ITPA-VE measures, F (1, 59) = 7.35, p = .009 and F (1, 59) = 6.83, p = .01, respectively. When compared with the control condition, those in the direct training condition also outperformed the control group, but only on the ITPA-VE measure, F (1,59) = 5.39, p = .02. When comparing the video condition and the direct training condition researchers found that the video group's scores were significantly higher than the direct training group on the EOWPVT (F (1, 59) + 7.36, p = .009) and the PPVT-R (F (1, 58) = 7.39, p = .009, but not on the ITPA-VE (F (1, 59) = .40, p = .53. Overall, the results reiterate the effects of previous studies, showing that mothers who use dialogic reading techniques increases children's language. Furthermore, this study indicates that videotape training provides a cost-effective means of implementing dialogic reading training, as it proved more effective than direct training methods.

Whitehurst et al. (1994) studied the effects of interactive shred book reading with low-income families in New York. Participants included 73, three year olds who attended preschool and whose vocabulary and language expression were about 10 months behind their chronological age. All participants were randomly assigned to one of three experimental conditions. The conditions included a school reading intervention, a school plus home reading intervention, and a control group. Teachers were trained to read to the children using dialogic shared storybook techniques using a videotape training method that included a set of rules along with examples and non-examples of adult-child book reading. Following the tape, the trainers and teachers engaged in roleplaying to show how students might act during shared book reading interactions. The same training method was used to train parents in the school plus home condition. Children in the control condition engaged in small group play activities with a teacher or teacher aide at

school. All of the participants were pretested using the PPVT-R (Dunn & Dunn, 1981), the EOWPVT-R (Gardner, 1990), the expressive subscale of the ITPA (Kirk, McCarthy, & Kirk, 1968), and a researcher created test of expressive vocabulary called the *Our Word.* The same instruments were used at posttest, which occurred immediately after the end of the 6-week intervention period. Follow-up testing occurred six months after post testing. Results showed that children in reading conditions (school plus home and school-only) gained approximately double the number of words between pretest and posttest than those in the control condition, $F(1, 50) = 2.74$, $p = .031$. Children in the school plus home condition performed better than children in the school-only condition, however; differences between the home plus school condition and the school-only condition were not significant, $F(1, 50) = 2.74$, $p = .104$. The researchers hypothesized that this was because of the study design, suggesting the need for a comparison condition with a parent only reading intervention.

In 1998, Lonigan and Whitehurst studied the effects of an interactive shared-reading intervention with 91 children from four different childcare centers in Tennessee. The children were assessed on three different standardized measures of oral language ability and were then randomly assigned to one of four different experimental conditions: school reading, home reading, school plus home reading, and a no treatment control condition. Parents and teachers were trained in dialogic reading using a videotape training method (e.g., Arnold et al., 1994; Whitehurst et al., 1990) that presented specific guidelines and vignettes (example and non-example) of adult-child reading interactions. The teachers watched an additional session on how to use dialogic reading in groups. No specific instruction or activities were provided for the children in the control group. In

addition, teachers were not informed if the child was participating in the home reading condition. Specific books were used during the intervention and parents were asked to fill out daily reading logs to indicate when the dialogic reading occurred and which books were used. The PPVT-R, EOWPVT-R, and the PPVT-R were used to assess oral language at both pre and posttest. In addition, the ITPA-VE was used to test verbal fluency. At the conclusion of the intervention only 60% of parents returned their reading logs and there were significant differences between how often the centers conducted the intervention sessions, making the results difficult to interpret. However, the effects were apparent on the EOWPVT and the ITPA-VE in centers with high intervention compliance, with an overall intervention effect size of .41, .30 for the school only group, and .74 for the school plus home group, and 1.19 for the home group. Overall, this study supports the use of shared reading interventions for children from low-income backgrounds, as it seems to increase the development of oral language skills. In addition, this study brought attention to some of the difficulties when conducting this type of research, as there are many variables that cannot be controlled by the experimenter (e.g., lack of center compliance).

Bus, van Ijzendoorn, and Pelllegrini's (1995) findings show that storybook interactions can also increase children's knowledge of written language, which can effect later reading achievement. Bus et al. used meta-analytic techniques to study this multitude of research and focused on frequency of parent-preschooler book reading as it relates to language growth, emergent literacy, and reading achievement. They found that parent-preschooler reading is related to language growth, emergent literacy, and reading

achievement, with an effect size of *d* =.59. Specifically, they found that book reading affects acquisition of written language as well.

Research also suggests that shared storybook reading provides children with the opportunity to acquire new vocabulary. Senechal and Cornell (1993) designed a study in which 160 children (80 four year old and 80 five year olds) listened to a story read by their parents who were trained on conversational devices to enhance vocabulary growth during shared book reading time. The children were randomly assigned to one of four reading conditions that focused on a different interactive book reading strategy; (1) questioning, (2) recasting (3) word-repetition, and (4) verbatim-reading. Prior to listening to the book all of the children were pretested for their knowledge of 10 target vocabulary words along with overall expressive and receptive vocabulary ability. They were then post tested for knowledge of the target words immediately after the reading session and then again a week later. Using a 2 x 4 factorial design, analyses of variance (ANOVAs) indicated that requesting active participation in the book-reading interactions did not directly boost the child's vocabulary learning as there was no difference between the two conditions. However, results were significant and showed that even a single reading of a storybook could boost a child's receptive vocabulary knowledge.

In another vocabulary related study, Robbins and Ehri (1994) examined kindergartners who were not yet reading. The students listened to an adult read the same storybook two times (2-4 days apart) and then completed a posttest that measured their knowledge of 22 unfamiliar words. Some of these words occurred throughout the story either two or four times while others were not heard in the story at all. The results of the study showed that the children recognized the words in the story more than words not

found in the story. Statistical analyses revealed a significant difference between storybook words and non-storybook words (p <.001). Again, these results suggest that storybook reading is an effective tool for building vocabulary.

Overall, the research on shared storybook reading is overwhelmingly positive as study results suggest that book reading can influence children's future literacy development and enhance their success in the areas of vocabulary, written language, and oral language skills. This research indicates that dialogic reading is an auspicious tool for enhancing the quality of shared reading interactions because it helps transmit early literacy knowledge and skills to children who engage in these shared interactive reading activities.

Parent-child language interventions. There is not a large amount of research on parent-child language interventions that is separate from the aforementioned studies on how shared-storybook reading influences a child's oral language development (e.g., Whitehurst et al. 1988; Lonigan and Whitehurst, 1998; Whitehurst et al., 1994). This gap or lack in research is most likely due to difficulties with capturing and analyzing home language interactions. The current study utilized a DLP and the LENA software in hopes of successfully increasing this area of research. There is indeed evidence that shows how important early language skills are to future reading outcomes (e.g., Whitehurst et al., 1988; Scarborough & Dobrich, 1990; Hart & Risley, 1995) but home visiting programs and interventions often fail to meet their goals of increases parent-child language interactions.

For example, Peterson, Luze, Eshbaugh, Jeon, and Kantz (2007) created a two-part study that examined the use of language interactions in home visiting interventions. The

first study included 28 families that had a child with a disability, who was receiving Part C services. The second study included 92 families receiving Early Head Start services. The researchers used the Home Visiting Observation Form (HVOF, McBride & Peterson, 1993) to collect data on the home visitor during their home visits. The home visitors were scored on when they facilitated direct teaching, modeling, and coaching of parent-child interactions. In addition, the research examined when and how the home visitor facilitated the child's play. Results showed that very little intervention time is focused on enhancing parenting behaviors through coaching or modeling. Furthermore, the observations revealed that the families' actual intervention time often did not match the program's stated goals. The researchers suggest that these results are due to lack of training and inability to clearly articulate and evaluate their program designs. These results are important because they identify a need for the understanding and development of evidence-based strategies related to increasing language in the home during all parts of the day (e.g., mealtime, bath time, playtime).

This research was designed to create an evidence-based home literacy intervention with easy implementation fidelity. The intervention involved easy to use, research and theory based technology (i.e. CAPs) paired with clearly defined and standardized measurements of parent progress (e.g., ACIRI, LENA software (number of conversational turns). However, like previous studies, problems with data collection of language samplings existed and no language enhancement conclusions can be made at this time. Parents watched the CAPs and read the books but failed to turn the DLP recording devices on throughout the day, leaving little data to analyze beyond the shared storybook sessions.

Content Acquisition Podcasts

Content Acquisition Podcasts (CAPs) are multimedia-based instructional modules created by Kennedy (2010), using Mayer's cognitive theory of multimedia learning [CTML], (2001, 2005, 2009). This learning theory relates to specific cognitive processing issues, stating that a person can learn better when he is able to pay attention to and organize words and graphics in working memory while also relating these ideas to his long-term memory (Mayer & Johnson, 2008). In other words, Mayer's model seeks to limit cognitive load while also maximizing human capacity to learn through visual and auditory channels. CAPs are an extension of Mayer's learning theory and have shown success in promoting learning for undergraduate teacher candidates and adolescents with and without a learning disability (Kennedy, 2010). Research shows that CAPs can successfully maximize student learning and retention in college courses that must cover a significant amount of content in a short amount of time.

Kennedy, Hart, and Kellams (2011) used CAPs in an experimental two-group posttest design study using 79 undergraduate pre-service teacher candidates. The participants were randomly assigned to one of two groups, a typical podcast versus and enhanced podcasts (CAPs). The podcasts were used in a university education course and covered content that had not yet been taught. Two sets of podcasts were shown and the content included information on the No Child Left Behind (NCLB) policy and Traumatic Brain Injury. A pretest was given to all students prior to viewing the podcasts. Following the intervention, students were given a posttest that included open-ended recall items (similar to the pretest) and open-ended transfer items. Results for the NCLB podcasts showed that the CAPs group significantly outperformed the typical podcast

group for the recall test items ($p < .01$); however, differences were not significant for the transfer test items. Cohen's *d* effect size ($d = .82$) showed a large effect for learning about the NCLB concepts. The students that viewed the CAPs on TBI scored significantly higher than those in the typical podcast group on both the recall ($p = .01$) and transfer ($p = .01$) items, with a moderate effect size ($d = .64$). While this study had limitations, including the use of a convenience sample and the lack of a true control group, the study supports the use of CAPs and indicates a reason for further research.

Kennedy and Thomas (2012) decided to look at the use of CAPs further by conducting a follow-up study that used CAPs to teach 164 pre-service teachers about school wide positive behavioral interventions and support (SW-PBIS). Like the previous study, the teacher candidates were given a pretest and randomly assigned to either watch a podcast (CAPs) or read a chapter (Lewis et al., 2006) and take notes on SW-PBIS. Following the intervention the participants were given a posttest directly after and then another posttest a few weeks later to look at maintenance. Once again, the CAP group scored significantly higher than the text-only group in both the posttest and maintenance phase with large effect sizes, $d = .98$ and .97, respectively.

Kennedy et al. (2012) continued this research and studied 168 preservice teachers' knowledge of characteristic of students with learning disabilities (LD) and high-functioning autism (HFA). This study differed slightly as it looked at the use of text-only and CAPs paired with text to determine whether the use of CAPs with supplemental materials was more effective before or after watching the CAPs. Students were given a researcher-created multiple-choice pretest for both LD and HFA. Students in both CAPs groups significantly outperformed students in the text-only group, with a large effect size

for the LD test (*d*= 1.24) and moderate for the HFA test (*d*= .63). However, there were no significant differences on the posttests between the two CAPs group suggesting that it does not matter whether students watch a CAP before or after reading text. Again, this study suggests that students who watch CAPs on a topic learn more than those students who read a textbook chapter and take notes.

Additionally, Kennedy, Driver, Pullen, Ely, & Cole (2013) looked at pre-service teachers' knowledge of phonological awareness (PA) and how to teach it. Participants included 155 undergraduates enrolled in an introductory special education course. The students had different backgrounds (e.g., general education majors, special education majors, non-education majors, previous reading coursework) so the sample was stratified and then students were randomly assigned to either participate in a CAPs-only or text-only group. Like previous studies, the students were given a researcher-created pretest a posttest, and maintenance test to examine their knowledge of PA. Results once again suggest that CAPs increase a person's ability to retain and learn information as the CAPs group significantly outperformed the text-only group at both posttest and maintenance with a large effect size both times.

While these studies all had limitations, namely being that convenience samples were used and that the test instruments were researcher-created, evidence supports the use of CAPs in teacher preparation programs. This is important because CAPs can provide important information and knowledge gain, that students may otherwise miss due to time constraints in courses that must cover a vast amount of content.

Similarly, home literacy programs also try to cover large quantities of content, but have a need to maximize parent learning with few resources, time, and money. This study

used CAPs to eliminate some of these issues. Like previous studies, the CAPs were researcher-created following Mayer's CTML and included clear and concise modules that sought to enhance a parent's early literacy knowledge and skills. The CAPs design used evidenced-based research on early language and literacy techniques and strategies. The enhanced podcasts provided clear examples of behavioral change that families could both understand and embrace. The study is unique, in that I combined two different types of early literacy research (i.e. shared storybook reading and language interactions), used a unique adapted version of the ACIRI scale that included counting of parent behaviors, and I used CAPs with families for the first time.

Research Questions

The alarming reading achievement statistics that currently face our nation and the aforementioned research in the areas of risk factors for reading disability, language and literacy development, home literacy, shared storybook and language interventions, and content acquisition podcast technology lead me to the following multi-part research question:

1. Does an ongoing intervention on shared storybook reading using CAPs increase the overall quality and quantity of shared book reading practices? Specifically, does it increase: (a) parent questioning? (b) parent referencing to picture or text? and (c) parent response to child verbalizations during shared book reading interactions?

CHAPTER III

METHODS

The purpose of this study was to determine whether the use of an early language and literacy training using CAPs enhances a parents' literacy knowledge, skills, and interactions with children who are at-risk for reading delays or disability.

Setting

The study took take place in a medium size college town in Central Virginia. The assessments, baseline phase, CAPs training sessions, shared book reading, and observations took place in the homes of two of the three families. The assessments, training sessions, and observation of the third family occurred in the researcher's office while the on-going shared storybook reading occurred at home. All three mothers implemented the intervention in their natural home environment.

Participants

I identified five participants (I use the term "participants" throughout the dissertation because the primary targets of the intervention were the parents even though each so-named participant consisted of a parent and child.) who met the at-risk criteria for inclusion in the study. Two of the participants, however, dropped out in the early stages of the baseline condition so I am reporting on the three who remained for the duration of the study. The participants resided in a medium size college town in Central Virginia. The mothers ranged from 17-24 years old, and the children ranged in age 20 to 46 months at the start of the study. Two of the three mothers had one additional younger child. Families were recruited because they met the criteria of having at least two risk factors that indicate their child will be at-risk for reading and language delays. The risk

factors include: (a) low receptive and/or expressive language skills, (b) a developmental delay, (c) less than adequate/late prenatal care, (d) low birth weight (<2500 grams), (e) prematurity, (f) a parent with a disability, (g) sibling with a disability, (h) high maternal stress levels, (i) maternal depression, (j) low socioeconomic status, (k) low maternal age, and (l) homelessness.

The first family included an African-American, 23-year old single mother and her three-year old daughter and her 4 month old son. The mother lived alone with her two children in government-subsidized housing and she was unemployed. The family displayed the following risk factors: (1) low socioeconomic status, (2) low maternal age, (3) high maternal stress level, and (4) late prenatal care. The second family included a 17-year old African-American mother and her 20-month old son. The mother attended high school during the day and lived with both her mother and father. The child's dad was mentioned during several sessions, but did not reside with the child. The family qualified for the study by meeting the following risk factors: (1) low socioeconomic status, (2) low maternal age, and (3) high maternal stress level. The third family included a 24-year old African-American mother and her three-year and one-year old sons. The mother resided with her mother, sister, and children and was unemployed until the end of the study. The family qualified for the study by meeting the following risk factors: (1) low socioeconomic status, (2) high maternal stress level, and (3) prematurity.

The study was approved by the University of Virginia Institutional Review Board for the Health Sciences (HSR Number: 16971). All three parents gave informed consent for their children to be tested during the screening phase using the Peabody Picture Vocabulary Test (PPVT-4) (Dunn & Dunn, 2007) to measure receptive language skills.

In addition, they agreed to (a) participate in the baseline and intervention phases of the study, (b) answer and literacy beliefs survey, and (c) participate in future follow-up observations. Parents had the option to participate in the intervention sessions in their own home or at the researcher's office. The parents were paid $50 for their participation in the study.

The researcher, a doctoral student and master's level special educator with eight years teaching experience served as the moderator and observer at all intervention sessions.

Design

A multiple baseline across subjects design was employed to evaluate the effects of the parent literacy training using CAPs. Data were graphed and used for visual comparison of change resulting from the intervention over time. Specifically, immediacy of the effect, lasting effect, change in mean, trend, and overlapping data points were examined.

Pre-baseline phase. Prior to baseline parents completed a survey on their in-home literacy beliefs and practices and their children were assessed using the Peabody Picture Vocabulary Test (PPVT-4) (Dunn & Dunn, 2007). The PPVT is an individually administered, norm-referenced test that provides an assessment of a child's English receptive vocabulary. It is used for children age 2 to 90+ years old. The PPVT is commonly used in studies that examine the effectiveness of dialogic reading interventions. During the test the examiner presents a series of illustrations that depict objects, actions, or concepts. The child is presented with four at a time and the examiner names one of the four and asks the child to point to the said illustration. The test

typically takes 15 to 20 minutes to administer. The PPVT-4 provided information on the general receptive vocabulary level of the children in order to gauge at what level of storybooks to use in the study.

Baseline phase. During the baseline phase of the study, parents read provided books with their child. The parents read each book three times, once being observed and two times at home while their child wore the DLP to record each session.

The first participant had a minimum of three sessions during the baseline phase. When the stable baseline was indicated, the second participant moved to the intervention phase. After the second participant reached a stable baseline, the third entered intervention.

Intervention phase. During the intervention phase, the mother watched one CAPs each week based on her own schedule. All CAPs were viewed on the researcher's laptop. After viewing the CAPs, the families received a new book to read with their child during the week and a new reading log to fill out. The families were reminded to read the book a minimum of three times before the next visit, once during the in-person observation and twice when their child wore the DLP.

Dependent Measures

The dependent measure was an adaptation of the observation measures of the Adult/Child Interactive Reading Inventory (ACIRI) (DeBruin-Parecki, 2007). Three of the components from this inventory were chosen, providing a total of three different dependent variable measures. The ACIRI has strong inter-observer agreement (97%) and concurrent validity. It is one of the most commonly employed instruments used by researchers to measure whether or not a parent engages in certain literacy-related

behaviors. The three categories chosen from this scale were: (1) parent questioning, (2) parent picture or print reference, and (3) parent response to child verbalization.

A strength of the ACIRI is that its format makes it easy to use. The observer simply marks whether the behavior in question has occurred at any time during the shared storybook reading. Although this format is appealing for some situations, for my purpose the typical administration of the ACIRI was a limitation because it didn't lend itself to a more fine-grained analysis necessary to detect change attributable to the intervention. Therefore, I converted the ACIRI so that the observer counted each time the parent engaged in one of the three behaviors. In other words, rather than checking a "yes" if the behavior was observed once or any number of times during each shared book reading, the observer recorded each instance of the target behaviors: (1) parent questioning, (2) parent picture or print referencing, and (3) parent response to child verbalizations. Therefore, rather than a score of 0 or 1 for each session, theoretically, the score could range from 0 to infinity. (In actuality, the range was from 0 to 23.)

Inter-Observer Agreement

The Language Environment Analysis System (LENA) was used to measure inter-observer agreement. Given the fact that the three families were chosen on the basis of being at-risk, I decided that having two observers present during the parent-child sessions might be too disruptive and diminish the naturalness of parent-child interactions. LENA is a hardware/software system inspired by the work of Hart and Risley (1995). It is a natural language environment system for infants, toddlers and young children. The system includes a Digital Language Processor (DLP) that captures up to 16 hours of a child's natural audio environment and specialized LENA clothing with pockets that hold

the DLP, allowing the child to move and play freely. The DLP records the language that occurs in the home and the analysis software creates a feedback report that provides information regarding the child's natural language environment. The DLP also records everything the child and any other person (within six feet of the child) speak during the recording session. The audio file can be converted into a .wav audio file and transcribed for further analysis.

A second observer listened to 20% of the sessions, using LENA to record the number of instances of each of the three target behaviors: parent questioning, parent picture of print reference, and parent response to child verbalizations.

Intervention

The independent variable was the literacy training provided using content acquisition podcasts (CAPs). Only one researcher showed all of the CAPs to the parent participants to maintain treatment fidelity.

CAPs are enhanced podcasts that pair visuals with text and audio and were used as a parent-training tool in the intervention. During the intervention phase parents watched a series of five CAPs related to enhancing language and literacy interaction in the home. The first podcast included an overview of the importance of early language and literacy and gave a brief introduction to dialogic shared storybook reading interactions. The remaining podcasts taught parents how to implement shared storybook reading and how to increase the quality and quantity of language interaction in the home. As such, the second CAPs reiterated the shared storybook technique using a specific example and also focused on increasing language during mealtime. The *Read Together Talk Together* program was used as a guide for the CAPs (i.e., use of the mnemonic devices, PEER and

CROWD) (see Table 1). The CAPs can be viewed on a DVD player, computer, or IPod), but all parents watched them on the researcher's laptop. All CAPs followed the CAP Production Steps for Delivery of Content (Kennedy, 2011) (see Appendix A).

Table 1

CAPs Content

Podcast Number	Shared storybook	Language	Book/Materials
Week 1	Introduction: PEER & CROWD	Importance	Book 1
Week 2	Recap & Example Focus: PEER	Mealtime	Book 2
Week 3	Recap & Example Focus: CROWD	Bath time	Book 3 & bath toys
Week 4	Recap & Example Focus: Open-ended Questioning	Playtime	Book 4 & puzzle
Week 5	Recap & Example Focus: Picture and print referencing	Mealtime	Book 5

Materials. The following materials were used throughout the intervention.

CAPs. The CAPs align with best practices in teaching early language and literacy and combine some of the *Read Together Talk Together* dialogic reading program strategies. The CAPs were all 10-15 minutes in length.

Read together talk together. This evidence-based program was used as guide when creating the CAPs. It is available for Toddlers (ages 2-3) and Preschool and Kindergartener (ages 4-5). The program guide teaches adults to use dialogic reading strategies and includes a teacher training video and a separate

parent training video. The approach is interactive and studies have shown that the program improves children's expressive language, sound and letter identification, emergent writing skills, and knowledge of print concepts (Blom-Hoffman, O'Neil-Pirozzi, & Cutting, 2006). The training video and guide were not shown to the parents.

Books and literacy materials. Children's books were provided to each family for use during the baseline and intervention phases. The same books were used for each participant during both baseline and intervention phases. The book titles and corresponding weeks can be found in Table 2 below. Books were chosen with the help of a literacy expert in the field of education to ensure a balance of text type, genre, and topic.

Table 2
Book Titles

Baseline	In the Small, Small Pond By: Denise Fleming
Baseline	Silly Sally By: Audrey Wood
Baseline	The Eensy-Weensy Spider By: Mary Ann Hoberman
Baseline	Clifford's the Big Red Dog By: Norman Birdwell
Week 1	Touch and Feel Farm By: DK Publishing
Week 2	Busy Toes By: C.W. Bowie
Week 3	I Love You Because You're You By: Lisa Baker
Week 4	It's My Turn By: David Bedford
Week 5	My Crayons Talk By: Patricia Hubbard

Reading log. Families received a reading log to record *all* instances of shared storybook reading that occur between the parent and child (see Appendix B).

Gift cards. Families received gift cards throughout the study as they complete the reading tasks. The families that completed the entire study received an amount totaling $50.

Social Validity

Social validity was addressed through the use of a parent survey (see Appendix C), given to determine whether the mother felt that the intervention was beneficial and effective.

Treatment Fidelity

Treatment fidelity was conducted through use of the same researcher for all intervention sessions, the same CAPs recordings and books for each week of intervention. In addition, the researcher used a checklist to ensure fidelity of the steps given and language used when interacting with the parent during each session (see Appendix D).

Data Analysis

To assess the effectiveness of the CAPs intervention, I used three data analysis techniques: (1) visual inspection of the data, (2) the percentage of non-overlapping data (PND), and (3) comparison of mean levels of performance between the baseline and intervention phase. Visual inspection is the time-honored method of determining

existence of treatment effects in single-subject research (Kazdin, 2010[1]; Sidman, 1960[2]). Visual inspection can be used to determine stability, abrupt changes after implementation of the intervention, and direction and level of trend lines. Research indicates that visual inspection holds up very well when compared with statistical analysis of single-subject data. Using hypothetical scenarios of results from A-B-A-B designs, Bobrovitz & Ottenbacher (1998)[3] found good agreement between visual and statistical analysis (.86), as well as high sensitivity (.84), specificity, (.88), and positive predictive ability (.91). Some have noted that visual inspection tends to be a more conservative indicator of treatment effects (Paronson & Baer, 1978[4]).

Even though visual inspection remains a popular method of analyzing single subject data, in recent years single-subject researchers have increased their use of statistical methods to determine treatment effects. One of the most popular, especially in special education, is the percentage of non-overlapping data (PND; Scruggs, Mastropieri, & Castro, 1987). I, therefore, also calculated PND to measure effectiveness of intervention. The table of mean levels helps reiterate the information collected and reported by both the visual inspection and the PND.

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[1] Kazdin, A.E. Single-case research designs: Methods for clinical and applied settings (2nd ed.). New York: Oxford University Press, 2010.

[2] Sidman, M. (1960). *Tactics of scientific research.* New York, NY: Basic Books.

[3] Brobrovitz, C. D., & Ottenbacker, K. J. (1998). Comparison of visual inspection and statistical analysis of single-subject data in rehabilitation research. *American Journal of Physical Medicine and Rehabilitation, 77, 94-102.*

[4] Paronson, B. S., & Baer, D. M. (1978). The analysis and presentation of graphic data. In T. R. Kratochwill (Ed.). *Single subject research: Strategies for evaluating change* (pp. 101-165). New York: NY: Academic Press.

CHAPTER IV

RESULTS

The results are presented in three figures. Figures 1-3 pertain to parent questioning, picture or text referencing, and response to child verbalizations, respectively.

Research Question 1: Does an on-going shared storybook reading intervention using Content Acquisition Podcasts (CAPs) increase parent questioning during parent-child shared book reading interactions?

In this study, a parent question was defined as any verbalization that warranted an answer/response from the child, including open and close-ended questions that began with the words, “who”, “what”, “when”, “where”, “why”, and “how”, etc. In addition, parent questions included phrases that prompted the child to respond, even if they did not begin with a typical question word. For example, phrases like “you say?” or “can you?”.

Visual Inspection of Data: Parent Questioning

As depicted in Figure 1, in the baseline phase, Family 1 showed a high degree of stability with the same data point of 0 questions asked for each of the three book sessions. Once intervention began, the number of questions rose immediately creating an upward trend.

Family 2 also displayed a high degree of stability in baseline with only slight variation between data points of 0 and 1, ending with a slight upward trend of 1 question asked during each book session. Like Family 1, upon intervention, Family 2’s data exhibited an immediate increase. At Session 3, this increase declined showing a medium degree of variability ranging from 7 to 23. After the initial dip, the data consistently rose again displaying an upward trend, ending with 23 occurrences of parent questioning.

The mother in Family 3 asked more questions in baseline than either of the other participants, with a range of 2-4 questions per session. Although the baseline showed some variability, it stabilized and ended with a slight downward trend. During the intervention phase, Family 3 displayed immediate increases in questioning and ended with a steep upward trend line.

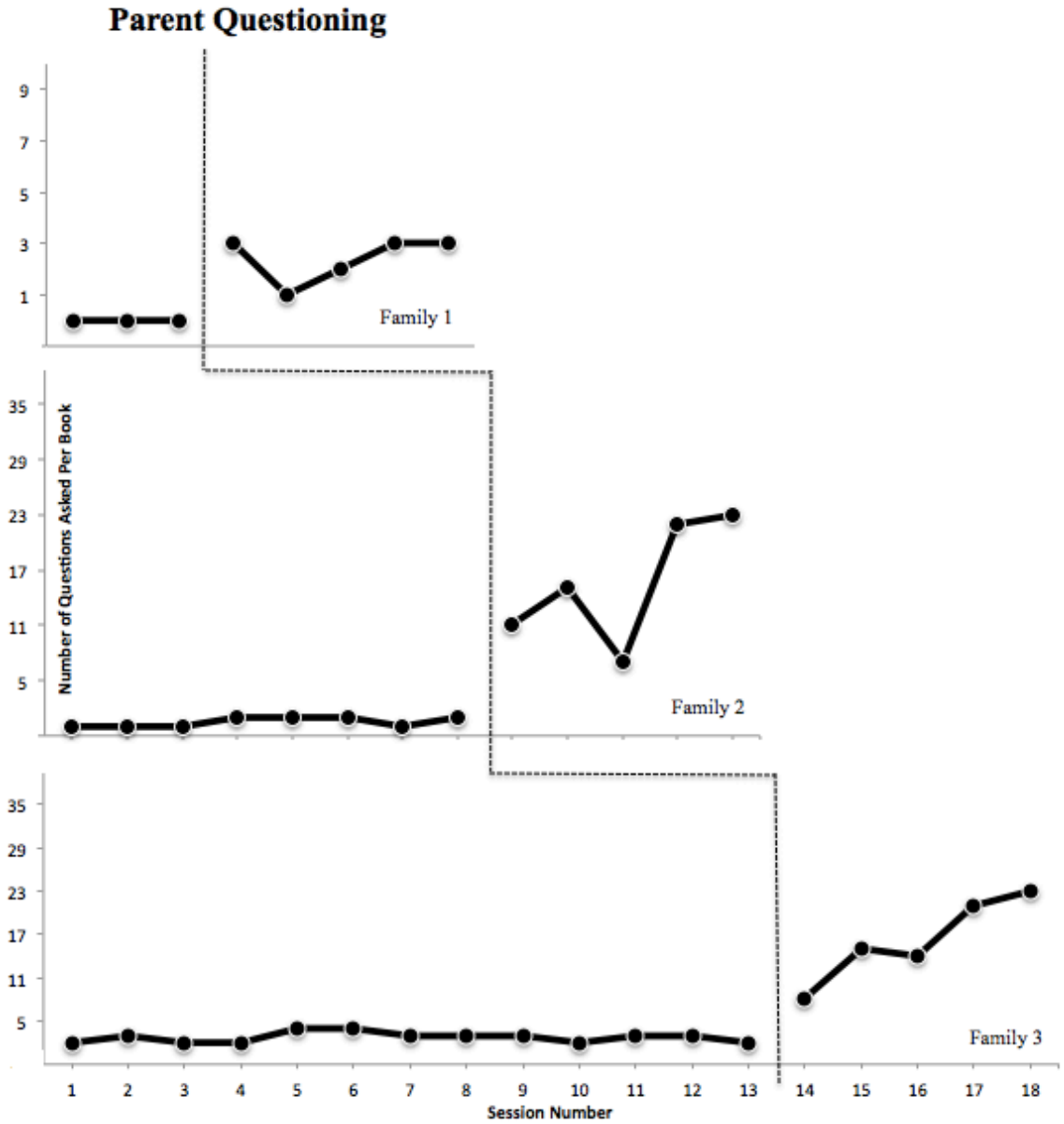

Figure 1. Rate of parent questioning during shared book reading sessions

Research Question 2: Does an on-going shared storybook reading intervention using Content Acquisition Podcasts (CAPs) increase parent referencing of pictures or text during parent-child shared book reading interactions?

Parent referencing of picture or text in this study was defined as any moment when the mother pointed to or talked about a picture or the text in the given book. These instances sometimes included questions, e.g., "Can you point to the _____"; however, it is important to note that such questions were only counted as picture or print references.

Visual Inspection of Data: Picture or Text Referencing

Family 1 displayed a high degree of stability during baseline with the same data point of 0 parent references to picture or text for each of the three book sessions. Once the intervention began, the number of questions immediately rose and then dipped for the next two sessions before rising again and stabilizing to a level higher than baseline.

Family 2 displayed a slight upward trend in baseline ending with a high degree of stability, displaying data points of 1 for the last 5 sessions. When beginning intervention, Family 2's data exhibited an immediate increase. At Session 3, this upward trajectory declined showing a medium degree of variability with data ranging from 4 to 13. After falling, the data never reached the highest point again but consistently rose during the remainder of the intervention.

Once again, the mother in Family 3 made more picture or text references in baseline than either of the other participants, with a mean of 1.92 references made per session. Although the baseline was higher than the other two families, it displayed a great degree of stability. During the intervention phase, Family 3 displayed a slight but immediate increase in referencing, ending with a steep upward trend line.

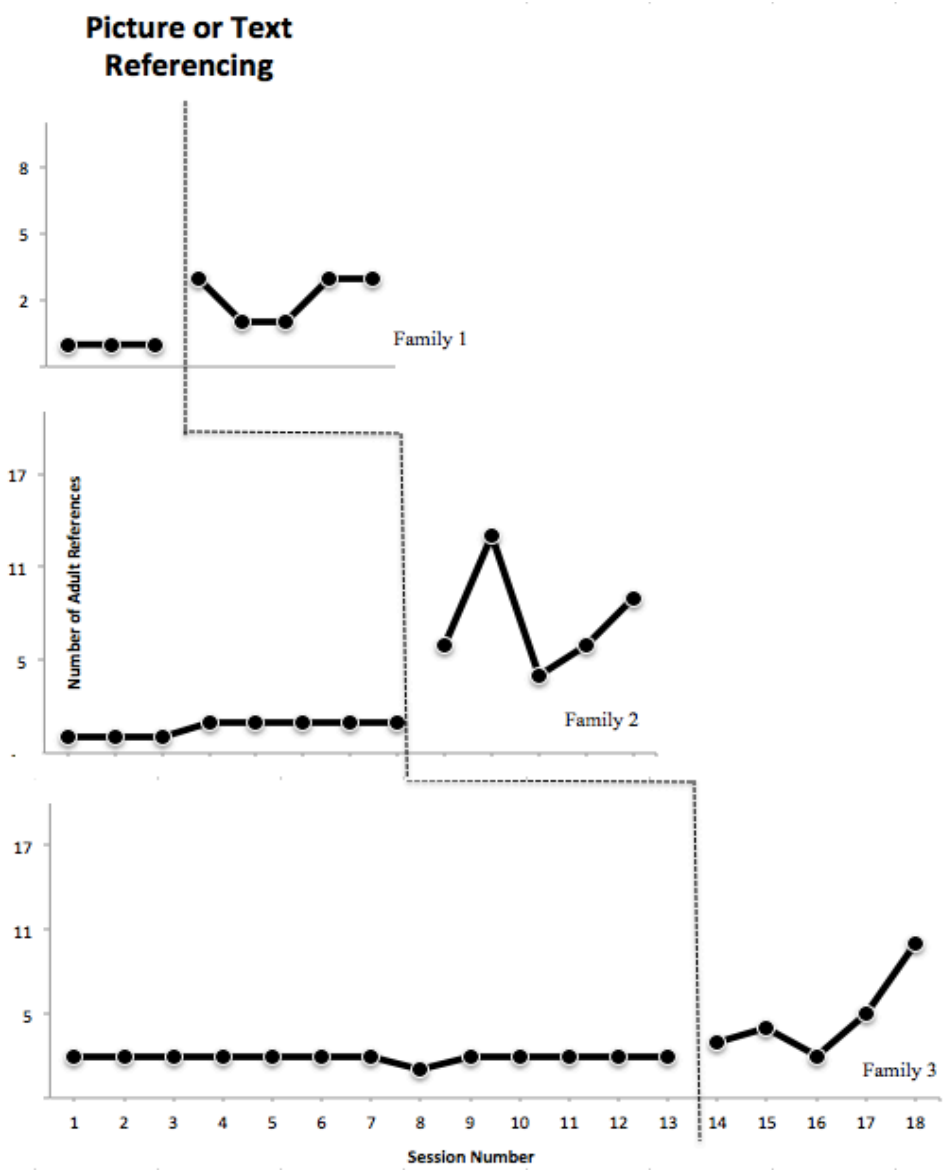

Figure 2. Rate of parent referencing picture or text during shared book reading sessions

Research Question 3: Does a shared storybook reading intervention using Content Acquisition Podcasts (CAPs) increase positive parent response to child verbalizations during parent-child shared book reading interactions?

In this study, positive parent responses to child verbalizations were defined as any instance in which the parent responded to a child's verbalization about the book. These instances were only counted if they were positive responses that either verified or

expanded on the child's utterance. Expansions of the child's language and responses of "mmhmm", "yes", or "uhhuh" were counted as positive verifications, but responses like "shh", "be quiet", and "not now" were defined as negative or discouraging responses to child talk and were not counted.

Visual Inspection of Data: Response to Child Verbalizations

Family 1 displayed a high degree of stability during baseline with the same data point of 0 parent references to picture or text for each of the three book sessions. Once the intervention began, the number of questions jumped immediately and then dipped slightly before rising to an upward trend.

In baseline, Family 2 displayed slight variability with data points varying between 0 and 1, but baseline ended with stability, displaying data points of 0 for the last three sessions. When beginning intervention, Family 2's data gradually increased and then dipped slightly, showing a small degree of variability, with data points ranging from1-8. After dropping, the data steadily increased with the last session displaying the highest data point on the upward trend.

Once again, the mother in Family 3 gave more positive responses during baseline than either of the other participants, with a mean of 2.15 positive responses made per session. Although the baseline was higher it displayed a high degree of stability, with the last four data points holding a value of 2. During the intervention phase, Family 3 displayed a slight but immediate increase and then displayed an upward but variable trend.

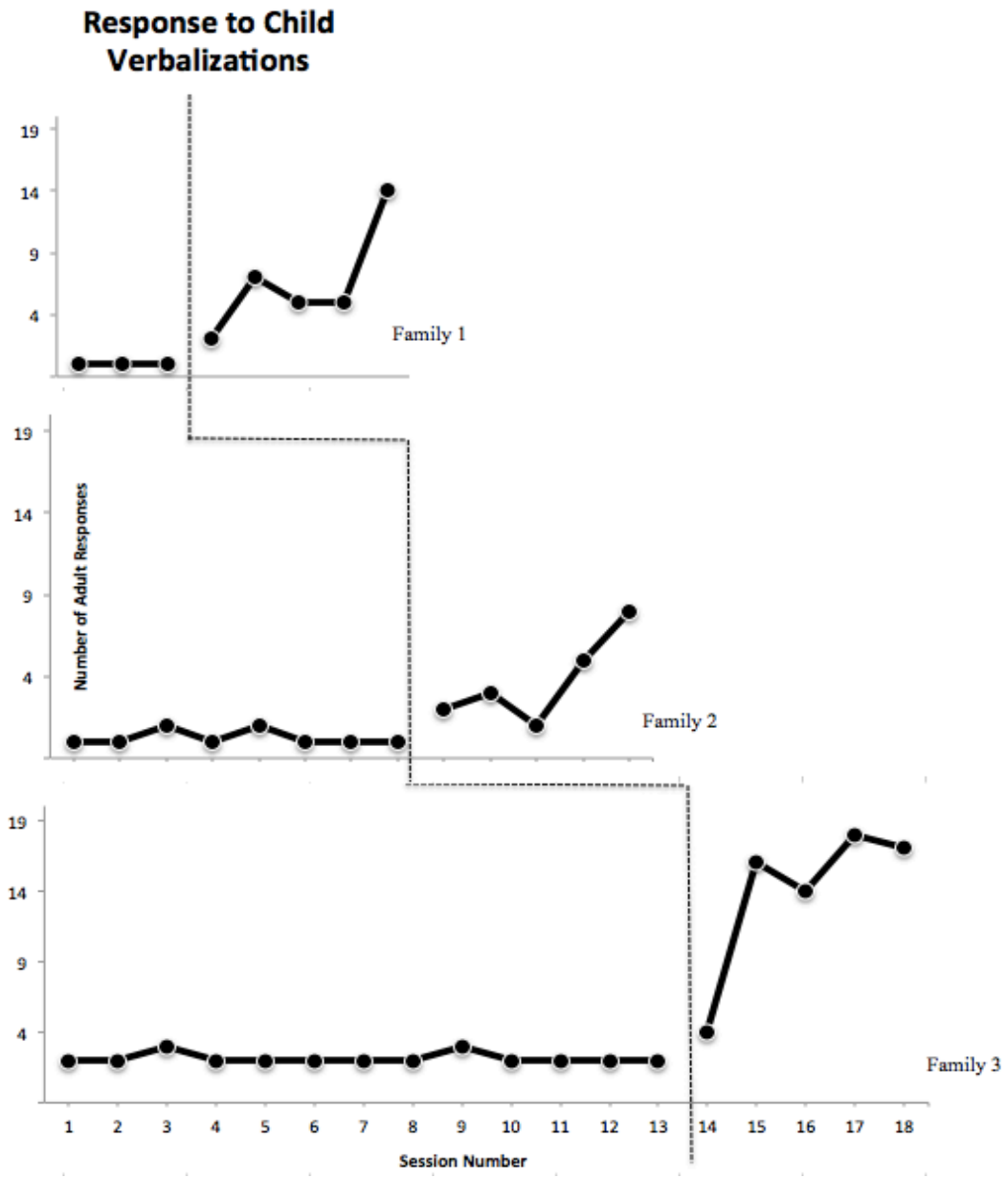

Figure 3. Rate of positive response to child talk during shared book reading sessions

Percentage of Non-Overlapping Data (PND)

The PNDs were exceedingly high, indicating a very strong treatment effect. There were a total of nine PNDs calculated: three research questions X three families. Seven of the nine PNDs were 100%. There were only two PND not to reach complete non-overlap between baseline phase and intervention phase. First, was Family 3's data for Research

Question 2: Picture or Text Referencing. Here one of the five intervention data points overlapped with the baseline phase data, resulting in a PND of 80%. Second, was Family 2's data for Research Question 3: Rate of Positive Response to Child Talk. Here one of the five intervention data points overlapped with baseline phase data resulting, again in a PND of 80%.

It's important to emphasize that these two instances of data overlap between intervention and baseline for Family 2 and Family were, in fact, the only instances of overlap for all data points for all three families over all three dependent variables. In other words, there were only two overlaps out of a total of 45 dependent variable data points, resulting in a PND of 96%.

Comparison of Baseline Versus Intervention Means

Table 3 displays each family's means for each question during baseline and intervention conditions. As was the case for visual inspection of the graphs and PND, differences between means demonstrate dramatic intervention effects. For each family, for each dependent variable, differences between baseline and intervention means were dramatic. Furthermore, taking into account all three families' baseline and intervention means for all three dependent variables, the difference between the grand total baseline and intervention mean was striking: 0.91 (baseline); 7.53 (intervention).

Table 3

Means in Baseline versus Intervention

Family One		
Research Question	*Baseline*	*Intervention*
1	0	2.40
2	0	2.20
3	0	6.60
Total	0	3.73
Family Two		
Research Question	*Baseline*	*Intervention*
1	0.50	15.60
2	0.62	7.60
3	0.25	3.80
Total	0.46	9.00
Family Three		
Research Question	*Baseline*	*Intervention*
1	2.77	16.20
2	1.92	4.80
3	2.15	13.80
Total	0	11.60

Inter-Observer Agreement

Inter-observer agreement was scored on 20% of all data points by two different researchers using an agree/disagree scale on each of the measures. The researchers listened to the LENA recordings during this process. The frequency ratio was calculated using the following formula: Frequency Ratio = Smaller total/Larger total x 100. The average percentage of agreement was calculated for the parent questioning, parent referencing, and parent positive response behaviors. Agreement percentages were 96.9%, 82.6%, and 93% respectively.

Kazdin (2011) suggests that percentages of 90% or higher indicate high reliability. The inter-observer agreement for both parent questioning and parent positive response meet this criteria. However, the percentage of agreement (82.6%) for parent referencing of pictures or text indicates a lower level of reliability. This is most likely due to the method of observation. Observer 1 was present for all book-reading sessions, whereas Observer 2 listened to recordings of the sessions (via LENA). It is likely that being able to see the parent point to the book versus not being able to see this influenced the score for this particular measure as it focused on picture and/or text referencing. Future studies should incorporate either video or in-person observations for both observers.

Treatment Fidelity

Family 1 and 2 were consistent in completing weekly reading logs, while family three did not complete any of the weekly logs. However, the weekly observations with the researcher and the DLP recordings were most useful in establishing fidelity. All three families read with their child while being observed and while their child wore the DLP.

The observations and recordings indicated that each family read and completed every book after each of the five intervention sessions. Furthermore, each mother reported that she enjoyed the study and did not want it to end. In addition, the children in family one and two showed evidence of reading the books at home, making comments during the observation session like "We get to read this again" or "When we read this last night I…", this provided confirmation that the mother was following the protocol and implementing weekly readings at home.

The intervention fidelity was high because the same researcher led all intervention sessions using the same CAPs for each week of the intervention phase. In addition, a checklist (see Appendix D) was used to ensure that the researcher introduced the content with high fidelity. The protocol was to state the topic for the week, hand the mother the headphones, start the CAPs, and then ask for questions at the end. There was only one instance when a parent asked a question and that was to make sure she didn't have to memorize the sequence of questioning provided in the podcast.

Social Validity

Each participant was asked to complete a survey pre and post-intervention. The pre-intervention survey asked about parent literacy beliefs and practices and the post-survey asked the same questions but also included questions about whether the parent felt the study was useful, enjoyable, and beneficial (see Appendix C). All three mothers completed the surveys; however, the mother in Family 1 did not fully complete the pre-baseline assessment. Social validity was measured by looking at both change in literacy beliefs and practices and by determining the parents overall view of the intervention upon completion of the study.

The Family 1 mother had one change in belief after the study. She changed her disagree to agree, indicating that that she now knew how to help her child learn. She did not complete the literacy practices part of the survey prior to intervention but did indicate that she read to the child once or twice a week post-intervention. In addition, she indicated that the training was useful, that her child enjoyed reading with her now, that she felt the intervention had a positive influence on her child's reading and language development, and that she would continue to use the books and reading strategies at home.

The mother in Family 2 indicated one slight change in belief after the intervention—she changed her response form agree to strongly agree for the belief that when she reads with her child she wants him to help her tell the story. Furthermore, her literacy practices of reading, playing games and drawing or writing with her child increased. Post-intervention she answered yes to all of the questions related to the perceptions of the study, showing that she felt the training was useful and effective. In addition, she stated, "even though her child didn't always sit down when she read the books, she knew that reading to him was still really helping him learn".

The literacy beliefs and practices of the mother in Family 3 did not change from the pre to post-survey. The mother indicated that she thought reading was extremely important and her reported home literacy practices were high pre and post-intervention. However, she did indicate that she thought the study was useful and that she learned from the CAPs. She also agreed that her child found the reading to be enjoyable, but did not answer the final question, asking if the study had a positive influence on her child's language and reading abilities.

CHAPTER V

DISCUSSION

The purpose of this study was to evaluate the effects of an early language and literacy training using a multimedia-based intervention (CAPs) on parents' literacy knowledge, skills, and interactions with their children who are at-risk for reading delays or disability. Specifically, whether the use of the CAPs increased parent questioning, parent picture and/or text referencing, and positive parent response to child verbalizations during shared storybook reading interactions.

Conclusions

The results from the single subjects multiple baseline design indicated changes in parental behavior following the CAPs intervention. Each of the three data analytic methods (visual inspection, percentage of non-overlapping data (PND), and comparison of baseline versus intervention means) demonstrated strong validation of guiding parents to use three important means of increasing parent-child verbal interaction during storybook reading.

However, there are extraneous variables that may have influenced data during baseline and treatment. The variables are different for each family. Family one participated in all baseline and intervention sessions in the natural environment, however, it was clear that when being observed the mother felt self-conscience and was often distracted by her infant son or other guests in the home. While her questioning, referencing, and response behaviors all increased from baseline to treatment, her overall mean scores for each behavior were much lower than the other two families. However, when compared to family two and three, the mother's level of response reached a much

higher level than her questioning and referencing strategies. This trend is most likely due to her child's behavior, as her daughter was very verbal and asked many questions throughout the story, lending more opportunities for parent response. The opposite was true of the child in family two, who was younger and less verbal than the two other children in the study. His lack of verbalizations gave the mother fewer opportunities to respond and thus, her mean score for this behavior is lower than the questioning and referencing scores. In addition, the television was on during every single visit, which often led to child and parent distraction. Extraneous variables for family three included the distraction of the mother's younger child and the inconsistency of natural environment as the parent requested that some of the observations be held in the home and some at the research center. This inconsistency may have influenced results.

For all families there were additional naturally occurring, but extraneous variables, that may have influenced the results of some sessions. First, sickness and time of day may have affected the outcomes, as sometimes the children or mother were more visibly sick or fatigued. In addition, book choice may have also influenced results of the study; the researcher was advised by a literacy expert on how to choose books for the study so that there was a balance in text type, genre, and topic. However, it was clear that some children and parents were more motivated by certain topics or genre. This motivation and interest level most likely affected the child's attention and the parents' behaviors during the reading session.

It is hypothesized that all of these extraneous variables may account for some of the variability seen in the data. Despite these minor inconsistencies and extraneous variables, overall results, suggest that the CAPs intervention has positive effects on

parents' literacy knowledge and ability to use research-based strategies during shared storybook reading. The visual inspection of graphs, PND, trend lines, and increase in means suggests that there is a relationship between using multimedia instruction (CAPs) on shared book reading strategies and a mothers' ability to enhance her child's reading experience through questioning, referencing, and response behaviors. However, there is not sufficient evidence to indicate that these changes in parent behavior directly affect the child's language and literacy abilities. Since language and literacy skills of children develop overtime, a longer treatment period is needed to accurately determine the relation to the mothers' change in behaviors and the child's expressive and receptive language skills.

Theoretical and Research Connections

The theoretical assumptions in this study are related to previous research on language, literacy, shared storybook reading, cognitive learning, and multimedia instruction (CAPs) and sought to answer the research question: Does the use of theoretically based multi-media instruction about evidence-based parent-child reading strategies support parents' ability to read interactively with their child who is at-risk for reading disability? And does this ability influence or support the child's language and literacy development?

The results of this research are novel in that CAPs were used with parents for the first time. However, the findings are similar to previous studies using CAPs (e.g., Kennedy, Hart, & Kellams, 2010; Kennedy et al., 2012; Kennedy, Lloyd, Cole, & Ely, 2012; Ely, Kennedy, Pullen, Williams, & Hirsch, 2013; Ely, Pullen, Kennedy, Hirsch, & Williams, 2014) and show positive and significant effects of CAPs with parents.

These results indicate an improvement of learning using the CAP intervention and help to solve a few problems commonly found in family home intervention studies. Bryant and Wasik (2004) explain that home intervention programs often face difficulties with organizing feasible training sessions that do not take up too much time for already overburdened families, Unorganized and time consuming intervention lead to a high attrition rate of families participating. In addition, lack of funding for resources and training of parent educators can also be a challenge, many fail to consider the training and supervision of the home visitors. Bryant & Wasik (2004) also suggest that effective home intervention programs must have clear models of behavioral change that both the home visitor and family understand and embrace.

CAPs are a positive solution to such challenges, as they do not require a lot of time, money, or training of parent educators and provide clear models of behavioral change. The sessions are short and easy to organize. In addition, they allow the parent to participate in the training on their own, which eliminates organization difficulties involving schedules and transportation.

Previous research shows that the same dialogic reading strategies parents learned and used during this study influence children's future language and literacy outcomes at home and in school (e.g., Heath, 1983; Taylor & Strickland, 1986; Whitehurst et al., 1988; Valdez-Menchaca & Whitehurst, 1992; Lonigan & Whitehurst, 1998; Justice et al., 2011). Further research and a longer intervention phase or follow-up is needed to determine if the children would show significant growth in this area.

The overall results from this study provide preliminary evidence that the theories of shared storybook reading and multimedia based learning can be combined to create a

more feasible, effective, and enhanced form of instruction for parents with children who are at-risk for disability.

Limitations

The short length of intervention (5 weeks) is one of several limitations to this study. A longer intervention would allow for a means of not only determining child benefits but also would allow for a more definitive assessment of parent growth in dialogic reading strategy behaviors. Continued use of CAPs would allow for repetition of the skills taught (questioning, referencing, and response) and would enable parents to learn other evidence based shared storybook reading practices (e.g., concept of print, predictions, and text to self connections).

The use of the researcher's headphones and laptop to view the CAPs may be a potential limitation for future studies. While the CAPs can be viewed on a variety of multimedia equipment (e.g., DVD, computer, ipod), if the study is designed on a larger scale, access to such resources could potentially affect future feasibility and results.

The small sample size also limits the generalizability of the results. While three participants is an appropriate sample size for a single subject design, the effects of the study can only be generalized to the greater population if families from different backgrounds and geographic regions had participated in the study.

In addition, the measurement tool used to assess parent knowledge and skill with shared storybook reading is a limitation. The dependent measure was adapted from the ACIRI, which is a standardized observation scale, however, the adapted tool is not and was designed to specifically measure the concepts targeted in the CAPs intervention, making it an informal and non-standardized instrument.

The use of different books during the baseline and intervention phases limits the findings in this study. Although the book selection was purposeful and aimed to balance genre, length, and topic, there are clearly differences between the books. These differences may have affected parent or child motivation, discussion, and overall performance during the shared reading experiences.

Finally, the CAPs tools and the CAP production steps (see Appendix A) were designed using theoretical research and the content followed evidence-based dialogic reading practices and before use, experienced professionals in the field reviewed the CAPs for accuracy, however; the researcher created all of the CAPs, a limitation for future replications of this study.

Future Research

The initial findings of this study are promising and have implications for future research. First, this is the only study that has explored the impact of CAPs on parents and future studies focused on parents would be beneficial and necessary in proving that the tool is effective with parents. In addition, experimental studies with greater sample sizes will be important to investigate in order to generalize this study to the greater population.

Beyond replication studies, further research should explore the use of CAPs focused on other content that is beneficial in improving parent-child interactions and outcomes. For example, using CAPs to teach parents about other important home practices like behavioral support strategies (Delanye & Kaiser, 2001) or healthy nutrition habits can extend the use and study the effectiveness of CAPs for parent learning.

Another potential area to pursue is the use of CAPs on shared storybook reading combined with video modeling of such strategies, which have been used in previous

literacy studies (e.g., Whitehurst et al., 1988). Studies may include comparisons between stand alone CAPs and video modeling interventions versus conditions that combine the two techniques. This will allow researchers to identify whether video modeling alone has the same effect as the multimedia-based learning tool.

Finally, future longitudinal studies using these tools will allow researchers to examine how similar interventions affect children's academic growth and achievement. A follow-up maintenance phase of this study will be conducted to begin this process of further research.

Summary

This single subject multiple baseline design study suggests that the CAPs intervention is an effective parent-learning tool for instruction on early literacy practice in the home, specifically dialogic shared storybook reading. The findings are important to the field of special education and early intervention as a child's literacy skills begin at birth with their parent(s). The effectiveness of the CAPs used in this study indicate that families who exhibit specific risk factors that may increase their child(ren)'s risk for disability can learn evidence-based practices that aid in their child(ren)'s success. Importantly, they can learn these strategies in a timely and cost effective manner. While the results of this study indicate positive effects, supplementary research using this tool with parents needs to be conducted with additional families and by other researchers in the field to further explore the overall effectiveness of the intervention tool and potential long-term effects on children's achievement.

REFERENCES

Arnold, D. H., Lonigan, C. J., Whitehurst, G. J., & Epstein, J. N. (1994). Accelerating language development through picture-book reading: Replication and extension to a videotaped training format. *Journal of Educational Psychology, 86,* 235-243.

Baker, L., Serpell, R., & Sonnenschein, S. (1995). Opportunities for literacy learning in the homes of urban preschoolers in *Family Literacy: Connections in Schools and Communities,* L.M. Morrowo, ed. Newark, DE: International Reading Association. p 236-252.

Belsky, J., Lerner, R. M., & Spanier, G. B. (1984). *The Child in the Family*. Reading, MA: Addison-Welsey Publishing Co, Inc.

Bishop, D. V. M., & Adams, C. (1990). A prospective study of the relationship between specific language impairment, phonological disorders and reading retardation. *Journal of Child Psychology and Psychiatry, 31,* 1027-1050.

Blom Hoffman, J., O'Neil, Pirozzi, T. M., & Cutting, J. (2006). Read together, talk together: The acceptability of teaching parents to use dialogic reading strategies via videotaped instruction. *Psychology in the Schools, 43*, 71-78. doi: 10.1002/pits.20130.

Bryant P. E., Bradley, L., Maclean, M., & Crossland, J. (1989). Nursery rhymes, phonological skills, and reading. *Journal of Child Language, 16*.

Bryant P. E., Bradley, L., Maclean, M., & Crossland, J. (1990). Rhyme and alliteration, phoneme detection, and learning to read. *Developmental Psychology, 26,* 429 438.

Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes

For success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research, 65,* 1-21.

Carter, D. R., Chard, D. J., & Pool, J. L. (2009). A family strengths approach to early language and literacy development. *Early Childhood Education Journal*, *36*, 519-526. doi: 10.1007/s10643-009-0312-5.

Carrow-Woolfolk, E. (1999). CASL: Comprehensive assessment of spoken language. American Guidance Services.

Catts, H. W., Fey, M., & Tomblin, B. (1997). Language basis of reading disabilities. In *Fourth Annual Meeting of the Society for the Scientific Study of Reading, Chicago, IL.*

Clay, M. M. (1993). *Reading Recovery: A guidebook for teachers in training.* Portsmouth, NH: Heinemann.

Cochran-Smith, M. (1983). Reading to children: A model for understanding texts. In B. B. Schieffelin & P. Gilmore (Eds.), *The acquisition of literacy: Ethnographic perspectives* (pp. 35-54). Norwood, NJ: Ablex.

Coplan, J. (1982). The early language milestone scale. Pro-ed.

DeFries, J. C., & Alarcon, M. (1996). Genetics of specific reading disability. *Mental Retardation and Developmental Disabilities Research Reviews, 2,* 39-47. doi: 10.1002/(SICI)1098-2779.

Delaney, E. M., & Kaiser, A. P. (2001). The effects of teaching parents blended communication and behavior support strategies. *Behavioral Disorder, 26,* 93.

Dunn, L., & Dunn, L. (1981). PPVT-R Manual. *Circle Pines, MN: American Guidance Service*.

Early Head Start National Resource Center. (2013). EHS-NRC. Washington, DC: Administration for Children and Families.

Frankenburg, W. K., & Dodds, J. B. (1967). The Denver developmental screening test. The Journal of pediatrics, 71(2), 181-191.

Fuchs, L. S., Fuchs, D., & Deno, S. L. (1982). Reliability and validity of curriculum based informal reading inventories. *Reading Research Quarterly, 18,* 6-26.

Gardner, M. F. (1990). *Expressive One-Word Picture Vocabulary Test.* Revised. Novato, CA: Academic Therapy Publications.

Goetze, S. K., & Burkett, J. A. (2010). Progress monitoring with whole text: A Comparison study of running records and curriculum-based measures. *College Reading Association Yearbook, 31,* 295-316.

Gomby, D. S., Culross, P. L., & Behrman, R. E. (1999). Home visiting: Recent program evaluations-analysis and recommendations. *Future of Children, 9*, 4-26.

Goodman, Y. M. (1986). Children coming to know literacy. Emergent literacy: Writing and reading, 1-14.

Ferrer, E., Shaywitz, B. A., Holahan, J. M., Marchione, K., & Shaywitz, S. E. (2010). Uncoupling of reading and IQ over time empirical evidence for a definition of dyslexia. *Psychological Science*, *21*, 93-101.

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

Harms, T., & Clifford, R. M. (1982). Assessing preschool environments with the early childhood environment rating scale. *Studies in Educational Evaluation, 8*, 261-269.

Hasbrouck, J. E., & Tindal, G. (1992). Curriculum-based oral reading fluency norms for students in grades 2 through 5. *Teaching Exceptional Children, 24,* 41-44.

Heath, S. (1983). *Ways with Words: Language Life and Work in Communities and Classrooms.* Cambridge: Cambridge University Press.

Hess, R. D., & Holloway, S. D. (1984). Family and school as educational institutions. In R. D. Parke (Ed.), *Review of research in child development* (Vol. 7, (pp. 179–222). Chicago: University of Chicago Press.

Holdaway, D. (1979). The foundations of literacy (Vol. 138). Sydney: Ashton Scholastic.

Jastak, S. R., & Wilkinson, G. S. (1984). Wide Range Achievement Test: WRAT-R. Western Psychological Services.

Justice, L. M., & Ezell, H. K. (2000). Stimulation children's print and word awareness through home-based parent intervention. *American Journal of Speech-Language Pathology, 9,* 257-269.

Kazdin, A. E. (2011). Single-case research designs: Methods for clinical and applied settings. Oxford University Press.

Kennedy, M. J., Hart, J. E., & Kellems, R. O. (2010). Using enhanced podcasts to augment limited instructional time in teacher preparation. *Teacher Education and Special Education,* pp. 1-19.

Kennedy, M. J., & Thomas, C. N. (2012). Effect of content acquisition podcasts to develop preservice teachers' knowledge of positive behavioral intervention and supports. *Exceptionality, 20,* 1-19. doi: 10.1080/09362835.2011.611088.

Kennedy, M. J., Lloyd, J. W., Cole, M., & Ely, E. (2012). Specially designed vocabulary instruction in the content areas: What does high quality instruction look like?

Teaching Exceptional Children Plus, 45(1), 7. Retrieved from http://tecplus.org/articles/article/1/0.

Kennedy, M. J., Ely, E., Thomas, C. N., Pullen, P. C, Newton, J. R, Ashworth, K, Cole, M, T., & Lovelace, S. P. (2012). Using multimedia tools to support teacher candidates' learning. *Teacher Education and Special Education, 35*, 243-257. http://dx.doi.org/10.1177/088840641245115.

Kennedy, M. J., Driver, M. K., Pullen, P. C., Ely, E., & Cole, M. T. (2013). Improving Teacher candidates' knowledge of phonological awareness: A multimedia approach. *Computers and Education, 64*, 42-51.

Kirk, S. A., McCarthy, J. J., & Kirk, W. D. (1968). Illinois test of psycholinguistic abilities (pp. 1-136). Urbana: University of Illinois Press.

Landry, S. H., Smith, K. E., Swank, P. R., & Miller-Loncar, C. L. (2000). Early maternal and child influences on children's later independent cognitive and social functioning. *Child Development, 71,* 358-375. doi: 10.1111/1467-8624.00150.

Lewis, M., and S. Feinman, eds. 1991. *Social Influences and Socialization in Infancy.* New York: Plenum Press.

Leichter, H. M. (1979). A comparative approach to policy analysis: health care policy in four nations. CUP Archive.

Lerner, J. (2003). *Learning disabilities: Theories, diagnosis, and teaching strategies* (9th ed.). Boston: Houghton Mifflin.

Lonigan, C. J., & Whitehurst, G. J. (1998). Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly, 13*, 263-290. doi:

10.1016/S0885-2006(99)80038-6.

Mayer, R. E. (2001). *Multimedia Learning.* New York: Cambridge University Press.

Mayer, R. E. (2005a). Cognitive theory of multimedia learning. In R. E. Mayer (Ed.), *Cambridge handbook of multimedia learning* (pp. 31– 48). New York: Cambridge University Press.

Mayer, R. E. & Johnson, C. I. (2008). Revising the redundancy principle in multimedia learning. *Journal of Educational Psychology, 100*(2), pp. 380-386.

Mayer, R. E. (2009). *Multimedia learning* (2nd ed). New York: Cambridge University Press.

Mercer, C. D., & Pullen, P. C. (2005). *Students with Learning Disabilities.* New York, NY: Merrill Prentice Hall.

Moats, L. C. (1999). *Teaching reading is rocket science: What expert teachers of reading should know and be able to do.* Washington, DC: American Federation of Teachers.

National Association for Education of Young Children. (1998). Learning to read and write: Developmentally appropriate practice for young children: A joint position statement of the International Reading Association and the National Association for the Education of Young Children. *Young Children, 53,* 30-46.

National Center for Education Statistics (NCES, 2005). *The Nation's Report Card.* Washington, DC: Institute of Education Sciences.

Nueman, S. B., and D. K. Dickinson, eds. 2001. Handbook of Early Literacy Research. New York: The Guildford Press.

Neuman, S. B., & Roskos, K. (1997). Literacy knowledge in practice: Contexts of participation for young writers and readers. *Reading Research Quarterly, 31,* 10

32. doi: 10.1598/RRQ.32.1.2.

Olds, D. L., & Kitzman, H. (1993). Review of research on home visiting for pregnant women and parents of young children. *The Future of Children*, *3,* 53-92.

Payne, A. C., Whitehurst, G. J., Grover, M., & Angell, A. L. (1994). The role of home literacy environment in the development of language ability in preschool children from low-income families. *Early Childhood Research Quarterly, 9*, 427-440. doi:10.1016/0885-2006(94)90018-3.

Pearson Early Learning (2002). *Read Together, Talk Together.*

Phillips, B. M., & Lonigan, C. J. (2009). Variations in the home literacy environment of preschool children: A cluster analytic approach. *Scientific Studies of Reading, 13,* 146-174. doi: 10.1080/10888430902769533.

Prescott, G. A., Balow, I. H., Hogan, T. P., & Farr, R. C. (1984). *Metropolitan Achievement Tests (MAT-6).* San Antonio, TX: Psychological Corp.

Pungello, E. P., Kupersmidt, J. B., Burchinal, M. R., & Patterson, C. J. (1996). Environmental risk factors and children's achievement from middle childhood to early adolescence. *Developmental Psychology, 32,* 755-767. doi: 10.1037/0012.

Reese, E., Sparks, A., & Leyva, D. (2010). A review of parent interventions for preschool children's language and emergent literacy. *Journal of Early Childhood Literacy, 10,* 97-117. doi: 10.1177/1468798409356987.

Reynell, J. *Reynell Developmental Language Scales.* Windsor: NFER Publishing, 1985.

Rescorla, L. (2009). Age 17 language and reading outcomes in late-talking toddlers: Support for a dimensional perspective on language delay. *Journal of Speech, Language, and Hearing Research, 52,* 16-30.

Robbins, C., & Ehri, L. C. (1994). Reading storybooks to kindergartners helps them learn new vocabulary words. *Journal of Educational Psychology*, *86*, 54-64. doi: 10.1037/0022-0663.86.1.54.

Roberts, J., Jurgens, J., & Burchinal, M. (2005). The role of home literacy practices in preschool children's language and emergent literacy skills. *Journal of Speech, Language, and Hearing Research, 48,* 345. doi:10.1044/1092-4388.

Rodgers, B. (1983). The identification and prevalence of specific reading retardation. *British Journal of Educational Psychology, 53,* 369-373.

Ross, J. A. (2004). Effects of running records assessment on early literacy achievement. *Journal of Educational Research, 97,* 186-194.

Rutter, M., & Yule, W. (1975). The concept of specific reading *retardation. Journal of Child Psychology and Psychiatry, 16,* 181-197.

Rush, K. L. (1999) Caregiver-child interactions and early literacy development of preschool children from low-income environments. *Topics in Early Childhood Special Education, 19,* 3-14. doi: 10.1177/027112149901900101.

Scarborough, H. S. (1998). Predicting the future achievement of second graders with reading disabilities: contributions of phonemic awareness, verbal memory, rapid naming, and IQ. *Annals of Dyslexia*, *48,* 115-136.

Scarborough, H. S., & Dobrich, W. (1990). Development of children with early language delays. *Journal of Speech and Heading Research, 33,* 70-83.

Scanlon, D. M., & Velluntino, F. R. (1996). Prerequisite skills, early instruction, and success in first-grade reading: Selected results from a longitudinal study. *Mental Retardation and Developmental Disabilities Research Reviews, 2*, 54-63.

Scruggs, T. E., Mastropieri, M. A., & Castro, G. (1987). The quantitative synthesis of single-subject research: Methodology and validation. Remedial and Special Education, 8, 24-33.

Senechal, M., & Cornell, E. H. (1993). Vocabulary acquisition through shared reading experiences. *Reading Research Quarterly, 28,* 360-374.

Shapiro, B. K., Palmer, F. B., Antell, S., Bilker, S., Ross, A., & Capute, A. J. (1990). Precursors of reading delay: Neurodevelopmental milestones. *Pediatrics,* 416-420.

Shaywitz, S. E., Shaywitz, B. A., Fletcher, J. M., & Escobar, M. D. (1990). Prevalence of reading disability in boys and girls: Results of the Connecticut Longitudinal Study, *Jama, 264(8),* 998-002.

Shaywitz, B. A.; Fletcher, J. M.; Holahan, J. M. (1992). *Journal of Learning Disabilities, 25,* 639-648. doi: 10.1177/002221949202501003.

Snow, C. E., Barnes, W. S., Chandler, J., Hemphill, L., & Goodman, I. F. (1991). *Unfulfilled expectations: Home and school influences on literacy.* Cambridge: Harvard University Press.

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children.* National Academies Press.

Snow, C. E., & Tabors, P. O. (1993). Language skills that relate to literacy development. *Language and literacy in early childhood education*, 1-20.

Snow, C., & Tabors, P. (1996). Intergenerational transfer of literacy. *Family Literacy: Directions in Research and Implications for Practice,* L.A. Benjamin and J. Lord, eds. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Stecker, P. M., Fuchs, L. S., & Fuchs, D. (2005). Using curriculum-based measurement to improve student achievement: Review of research. *Psychology in the School, 42,* 795-819.

Stringfield, S., & Teddlie, C. (1987). A Time to Summarize: Six Years and Three Phases of the Louisiana School Effectiveness Study.

Sulzby, E., & Teale, W. (1991). Emergent literacy. In R. Barret al. (Eds.), *Handbook of reading research* (Vol. 2, pp. 727-758). New York: Longman.

Teale, W. H., & Sulzby, E. (1989). Emergent literacy: New perspectives. Emerging literacy: Young children learn to read and write, 1-15.

Teddlie, C., Kirby, P. C., & Stringfield, S. (1989). Effective versus ineffective schools: Observable differences in the classroom. *American Journal of Education*, *97,* 221-236.

Taylor, D. (1983). Reflections on parenting: A multigenerational perspective. *Family Process, 22*, 341-346.

Taylor, D., & Dorsey-Gaines, C. (1988). Growing up literate.

Taylor, D., & Strickland, D. S. (1986). Family storybook reading. Portsmouth, NH: Heinemann. doi:10.1111/j.1545-5300.1983.00341.x

Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special Education, 25,* 252-261.

United States Department of Education. (2003). *State administration of the even start family literacy program: Structure, process, and practices.* (DOE Document No. 2003-14). Washington, DC: U.S. Government Printing Office.

Valdez-Menchaca, M. C., & Whitehurst, G. J. (1992). Accelerating language

development through picture book reading: A systematic extension to Mexican daycare. Developmental Psychology, 28, 1106-1114. doi:10.1037/0012-1649.28.6.1106.

Van Steensel, R. (2006). Relations between socio‐cultural factors, the home literacy environment and children's literacy development in the first years of primary education. *Journal of Research in Reading*, *29*, 367-382. doi: 10.1111/j.1467-9817.2006.00301.x.

Velluntino, F. R., Scanlon, D. M., Small, S., & Fanuele, D. P. (2006). Response to intervention as a vehicle for distinguishing between children with and without reading disabilities: Evidence for the role of kindergarten and first-grade interventions. *Journal of Learning Disabilities, 39*, 157-169.

Volger, G. P, DeFries, J. C., & Decker, S. N. (1985). Family history as an indicator of risk for reading disability. *Journal of Learning Disabilities, 18,* 419-421. doi: 10.1177/002221948501800711

van Kleeck, A., & Schuele, C. M. (2010). Historical perspectives on literacy in early childhood. *American Journal of Speech-Language Pathology, 19*, 341-355. doi: 10.1044/1058-0360(2010/09-0038).

Walker, D., Greenwood, C., Hart, B., & Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development, 65,* 606-621.

Wasik, B. H., & Roberts, R. N. (1994). Survey of home visiting programs for abused and neglected children and their families. *Child Abuse & Neglect*, *18*, 271-283. doi: 10.1016/0145-2134(94)90111-2.

Wasik, B.A., Bond, M.A., & Hindman, A. (2006). The effects of language and literacy intervention on head start children and teachers. *Journal of Educational Psychology, 98*(1), 63-74. doi: 10.1037/0022-0663.98.1.63

Wasik, B. H., & Herrmannn, S. (2004). Family literacy: History, concepts, services. In B. H. Wasik (Ed.), *Handbook of family literacy* (pp. 3-22). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Weigel, D. J., Martin, S. S., & Bennet, K. K. (2006). Contribution of the home literacy environment to preschool-aged children's emerging literacy and language skills. *Early Child Development and Care, 176,* 357-378. doi: 10.1080/03004430500063747.

Wechsler, D. (2008). Wechsler Adult Intelligence Scale-Third Edition (WAIS-III). San Antonio, TX : NCS Pearson.

Wechsler, D. (2008). Wechsler Adult Intelligence Scale–Fourth Edition (WAIS–IV). San Antonio, TX: NCS Pearson.

White, K. R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin*, *91*, 461. doi: 10.1037/0033-2909.91.3.461.

Whitehurst, G. J., Falco, F. L., Lonigan, C., Fischel, J. E., DeBaryshe, B. D., Valdez Menchaca, M. C., & Caulfield, M. (1988). Accelerating language development through picture book reading. *Developmental Psychology, 24,* 552-558.

Whitehurst, G. J., Arnold, D. S., Epstein, J. N., Angell, A. L., Smith, M., & Fischel, J. E. (1994). A picture book reading intervention in day care and home for children from low-income families. *Developmental Psychology, 30,* 679-689. doi: 10.1037/0012.

Wiig, E. H., Secord, W., & Semel, E. (1992). CELF-Preschool. Clinical Evaluation of

Language Fundamentals—Preschool. Examiner's Manual. The Psychological Corporation, San Antonio.

Woodcock, R. W. (1987). Woodcock reading mastery tests, revised. Circle Pines, MN: American Guidance Service.

Appendix A

CAP Production Steps for Delivery of Content

Phase 1: Preparation
Step 1.0 Identify ONE clear topic or concept to be taught in each CAP. For Example: What is are the characteristics of students with specific learning disabilities? 1.1 Brainstorm the most important information to include in your CAP.
Step 2.0: Create 'standard' PowerPoint slides (heading and bulleted supporting points) for your topic. 2.1 Create a clear PowerPoint title page slide 2.2 Put only one detail or piece of information on each slide. 2.3 Make sure you have a slide at the beginning and end that gives the exact definition you want people to remember. Give at least one clear example that illustrates the meaning of the term. 2.4 Type speaker notes for each slide (under the slide where it says: Click to add a note); print a copy of your slides and speaker notes to use when recording narration later on. 2.5 Remember to keep it simple--eliminate extra content from slides and your planned comments.
Phase 2: Production
Step 3.0 Replace most of the slides you created in step 2 with images that represent your topic as closely as possible (keep the title slide). ***For example: A slide that introduces the concept of alliteration might contain a picture showing that 'Bill Bounced a Ball'.*** 3.1 Select one eye-catching image per key idea. Use google.com/images, bing.com/images or another internet search engine to find copyright-free photos or other images. Save the image to a folder you create for this project. Store all of your saved pictures in the same folder. 3.2 Select medium to large images that fill most of the available slide space but don't let them get fuzzy or distorted. 3.3 Avoid cluttered images with words or distracting details. The pictures you select should have a central focal point that limits the need for viewers to move their eyes across the screen. 3.4 For slides where you plan to insert text over a picture to emphasize key terms or ideas, make three copies of that slide.
Step 4.0: Insert text over images by using 'insert text box' on the second of the three slides. The first and third slide should be free of text. 4.1 Select one word or a short phrase (3-4 words) that demonstrates the key idea for the slide and type it into the text box. Using full sentences is not advised. Be clear and concise. 4.2 Use 40 point or larger font size; select text color that is easy to read given the contrast with the background images and colors. [NOTE: The text box "fill color" tool make be used to ensure good contrast between images and text.] 4.3: Place text boxes either in the middle of the slide or near a major part of the picture without covering it up.

Step 5.0: Prepare and time your slide narration so it coincides with any on-screen text.
For example, when recording a presentation about making pizza:

5.1 Create three identical slides using the steps above. Insert a text box (See Steps 3.0-4.3 above) in the second of three identical slides that has the words "add cheese".
5.2 Begin narrating these slides (See Step 6.0). With Slide 1 of 3 on the screen say, "The next step in making pizza is…", then hit "Enter" to advance to the second slide which is already prepared with the text box and say, "add cheese," (narration will match text on the screen), hit "Enter," and finish narration on this part of making a pizza while slide 3 (without any text, but same picture) is on screen.
5.3 Repeat this process for every key piece of information to be addressed in the CAP.
VERY IMPORTANT: Not every picture needs additional text—reserve use of text for the most essential concepts/pieces of information within your CAP.

Step 6.0: Finalize slides and familiarize yourself with the written narrative before recording narration. Save your file.

6.1 Under PowerPoint pull-down menu, click 'Slide Show', and then, 'Rehearse Timings."
6.2 Rehearse narration using your printed slides and speaker notes—they are your "script"; hit enter to advance through the slides. Note the total length of your narration when done.
6.3 PowerPoint will ask if you want it to automatically link the amount of time you spent on each slide for later use. CLICK YES.
6.4 Practice recording podcast several times until comfortable and confident. If it is longer than 3 minutes (shorter is fine), or if more than three-five concepts are presented, divide the CAP content into two or more podcasts (part I, part II).
6.5 Save the file as a movie. Select the quality of playback (highest quality is recommended)

Step 7.0: Import saved .ppt movie file into your choice of iMovie (MAC) or Windows MovieMaker (PC).

7.1 There are several options for recording narration and linking to your movie—there is no 'correct' way. Recording narration within PowerPoint is possible, but is frequently unreliable (based on experience with Office 2011 or previous versions). An easy way for novices to record narration following the preceding steps is Apple's iMovie or Window's Movie Maker programs.
7.2 Drag the file into the video production timeline (at bottom of screen in both iMovie and Movie Maker).
7.3 Ensure your computer's built in microphone or external mic is functioning properly and at an appropriate volume. Record a test statement to confirm audio level prior to narration.
7.4 Record narration in a room free from background noise or other distractions. Preview your recording. If sound is distorted or otherwise imperfect, diagnose the problem (you were too close to microphone, etc.) and re-record.
7.5 Speak in a clear, engaging voice; record in front of a mirror or with another person to

create a more natural-sounding recording. Use good posture, smiling, and hand gestures can also improve the quality of vocal recordings. 7.6 Listen to your recording for unnecessary pauses (um's or other dead air). If they are noticeable/distracting, re-record your CAP. 7.7 Save/Export your finished video as a quicktime or windows media file.
Phase 3: Publishing
Step 8.0 Upload your saved video to the web 8.1 Upload your CAP to course management websites (e.g., BlackBoard) or other file-sharing sites (e.g., www.vimeo.com; www.youtube.com).

Appendix B

Daily Reading Log

Reading Log

Today's Date:
_____

Title of Book(s) Shared:
_____

_____

Time of Book Sharing (3:35pm):

_____

Hours DLP was worn (10am-6pm):
_____

Check the box to indicate yes or no:

My child took a nap today.	□ Yes	□ No
My child wore the DLP during mealtime.	□ Yes	□ No
My child wore the DLP during playtime.	□ Yes	□ No
My child wore the DLP outside today.	□ Yes	□ No
I do not want today's DLP data used.	□ Yes	□ No

If yes, please indicate the exact hours and time of day that you do not want used.

Appendix C

Parent Survey

Pre-Intervention and Post-Intervention Versions

Parent Literacy Beliefs and Practices Questionnaire
(Adapted from: DeBaryshe & Binder, 1994 and Bennett et al., 2002)
(Pre-Intervention)

Please read the following statements about literacy beliefs and circle whether you strongly disagree, disagree, agree, or strongly agree with each statement.

1) As a parent, I play an important role in my child's development

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

2) I find it boring or difficult to read to my child

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

3) When we read, I want my child to help me tell the story

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

4) My child is too young to learn about reading

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

5) Reading helps children learn about things they never see in real life

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

6) I don't teach my child to read because there is no room and no quiet place in the house

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

7) Children inherit their language ability from their parents, it's in their genes

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

8) I would like to help my child learn, but I don't know how

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

9) When we read I try to sound excited so my child stays interested

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

10) I don't need to spend a lot of time reading with my child at home, he or she will learn to read at school

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

Please answer the following questions about your literacy practices in the home:

1)How often do you or another family member read to your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

2) How often do you or another family member tell stories with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

3) How often do you or another family member play games with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

4) How often do you sit down at the table and eat a meal with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

5) How often do you or another family member color, draw, or write with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

Parent Literacy Beliefs and Practices Questionnaire
(Adapted from: DeBaryshe & Binder, 1994 and Bennett et al., 2002)
(Post-Intervention)

Please read the following statements about literacy beliefs and circle whether you strongly disagree, disagree, agree, or strongly agree with each statement.

1) As a parent, I play an important role in my child's development

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

2) I find it boring or difficult to read to my child

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

3) When we read, I want my child to help me tell the story

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

4) My child is too young to learn about reading

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

5) Reading helps children learn about things they never see in real life

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

6) I don't teach my child to read because there is no room and no quiet place in the house

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

7) Children inherit their language ability from their parents, it's in their genes

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

8) I would like to help my child learn, but I don't know how

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

9) When we read I try to sound excited so my child stays interested

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

10) I don't need to spend a lot of time reading with my child at home, he or she will learn to read at school

1	2	3	4
(strongly disagree)	(disagree)	(agree)	(strongly agree)

Please answer the following questions about your literacy practices in the home:

1) How often do you or another family member read to your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

2) How often do you or another family member tell stories with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

3) How often do you or another family member play games with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

4) How often do you sit down at the table and eat a meal with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

5) How often do you or another family member color, draw, or write with your child?

1	2	3	4	5
(hardly ever)	(once or twice/month)	(once or twice/week)	(once/day)	(two or more times/day)

Please answer the following questions about your participation in this study.

1) Did this study help you learn about reading with your child?
   ☐ Yes ☐ No

2) Did you find the videos you watch in the study useful?
   ☐ Yes ☐ No
3) Do you plan to continue reading books with your child using the techniques you learned?
   ☐ Yes ☐ No

4) Did you enjoy reading with your child?
   ☐ Yes ☐ No

5) Do you think your child enjoyed reading with you?
   ☐ Yes ☐ No

6) Do you think participating in this study has a positive influence on your child's reading and language skills?
   ☐ Yes ☐ No

   Additional comments:

   _____

   _____

Appendix D

Treatment Fidelity Checklist

Treatment Fidelity Checklist

1)

□ Researcher introduces the CAP for the week. “Today you will watch a podcast about _____” (i.e. a shared storybook reading strategy called PEER).

2)

□Researcher sets up the headphones and laptop for the parent.

3)

□ Researcher begins the CAP by pressing play.

4)

□ Researcher engages the child(ren) so that the mother can focus on the CAP.

5)

□ Upon completion of the CAP, the researcher asks the parent if she has any questions on the content seen in the podcast.

6)

□ The research present the family with the new book for the week, reading the title one time.

7)

□ The researcher reminds the parent to read the book three times with the child over the course of the week using the strategies learned in the CAPs. Stating “Remember to read this book three times this week using the open-ended questioning strategy that you just learned about in the podcast”.