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A Head Start to Learning: Exploration of a Parent-Directed Intervention to Promote Early Literacy Skill Development

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A Head Start to Learning: Exploration of a Parent-Directed Intervention to Promote Early Literacy Skill Development

by

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Dedication

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Abstract

This study examined the effects of a parent-led intervention focused on developing children's early literacy skills within the home setting. The lesson plans contain scripted steps for completing activities to teach letter names and phonological awareness skills. Archival data were analyzed from a study conducted with 26 families from three Head Start centers. Thirteen families completed the intervention and thirteen families were enrolled in a control condition which provided information on shared reading strategies. Children in the intervention group performed at statistically significant higher levels on measures of letter naming, phonological awareness, vocabulary/oral language, and comprehension. Parents rated both the intervention and control conditions as highly acceptable. Most parents (n= 10) within the intervention group completed the vast majority of the lesson plans. Changes within the home revealed that parents in both groups engaged in the same types of early learning activities, but that parents in the intervention group reported engaging in these activities more frequently than the control group. This study contributes to the literature by creating a method of parental involvement in preschool targeting phonological awareness and letter naming abilities.

Chapter One: Introduction

Statement of the Problem

The development of literacy by adulthood has become a national concern within the United States. Statistics from a national study commissioned by the U.S. government revealed that 14% of American adults possess below basic literacy skills (National Center for Education Statistics [NCES], 2005). Adults with this level of literacy are likely to struggle with simple reading tasks such as completing a job application or understanding a TV guide (NCES, 2005). The NCES (2007) also found that when compared to the population living in households, prisoners were significantly more likely to possess lower levels of literacy. An examination of the impact of illiteracy on health care has found high costs due to patients not being able to accurately read and interpret instructions for their personal medical care or medication schedule (Cho, Lee, Arozullah, & Crittenden, 2008). These results clearly indicate the need to prioritize the creation of a literate population as a major issue for the U.S. government.

To begin to address the literacy concerns within the nation, legislation has been enacted to set standards for achievement levels of children (e.g., No Child Left Behind Act, NCLB) and to increase parent involvement in their child's education (e.g., Section 1118). The NCLB mandates that children's achievement in reading and math be regularly monitored and that all students perform at state standard levels by the 2013-2014 school year. Section 1118 within NCLB outlines the school's role in fostering

active parent involvement. Schools are now expected to include parents in assisting a child's learning and making educational decisions about their child.

The importance of parental involvement in a child's education stems from numerous studies documenting the positive relationship between involvement and academic achievement (Epstein, 2002; Fantuzzo, McWayne, Perry, & Childs, 2004). Parental involvement has been found to be a factor which increases a child's reading abilities and can have a greater impact on a child's learning than factors such as socioeconomic status, racial background, and parental education (Arnold, Zeljo, Doctoroff & Ortiz, 2008; Epstein, 1996). Many empirical studies have examined the influence that parental involvement has during formal schooling, but there is a paucity of research at the preschool level. It is essential to focus on the potential ways parental involvement can be facilitated to promote children's early literacy development and prevent later learning difficulties.

Prevention and Early Intervention in Literacy Skills

Preventative efforts are appearing more frequently in research and legislation in order to lessen the problems with literacy in the United States. A strong foundation in early literacy skills can prevent the "Matthew Effect" where students who struggle with early reading skills continue to master later skills at a slower rate, resulting in a gap that widens over time between the child and his/her peers (Stanovich, 1986). One potential method to prevent the "Matthew Effect" is to assist children in developing strong pre-reading skills to improve their chances of being successful when they enroll in formal schooling. The National Early Literacy Panel (NELP; 2008) has confirmed the importance of phonological awareness and letter knowledge in predicting future reading

success among other skills. Phonological awareness and letter naming skills begin to develop during the preschool years and therefore can be targets for prevention of later reading difficulties. Although preschool teachers can focus a portion of their instruction on these skills, children may benefit from continued exposure to develop these skills when not in a school setting. Children spend much of their time with their parents during the preschool years (U.S. Census Bureau, 2002), making parents an ideal resource for the implementation of interventions.

To promote parental involvement in early learning, providing guidance and structure for learning activities can ensure that the experience between the parent and child is positive and likely to continue. In addition, guidance from professionals in education allows for parents to focus their efforts on activities that will teach important skills for later development. Interactions that result in positive changes in children's skills are an essential outcome to consider for families that may have numerous time demands. Parents are more likely to continue interacting with their child around early learning activities if the child is making progress. Finally, although some parents may be "natural" teachers, other parents may need to be given the tools to teach children specific skills or to feel comfortable in this role (Heriot, 2009).

Parent Involvement in Preschool

Limited research is available examining parent involvement at the preschool level. A review of the extant literature found only four studies that explored the relationship between parent involvement and preschool children's early literacy skills (Arnold, Zeljo, Doctoroff, & Ortiz, 2008). However, three of these studies had key flaws such as inclusion of a limited range of items assessing parental involvement, having

teachers rate both child skills and parent involvement, and analyzing only correlations between the teacher ratings of parent involvement and ratings of children's skills (Mantzicopoulos, 1997; Marcon, 1999; Taylor & Machida, 1994). The fourth study directly measured children's skills through assessments and examined parental involvement by having parents rate the frequency they engaged in specific involvement-related behaviors in the home, at the preschool, and in communicating between the home and school environments (Fantuzzo et al., 2004). The results of this study found a strong positive relationship between receptive vocabulary and frequency of engagement in home-based parent involvement activities.

One predictor of the level of parent involvement within the home is socioeconomic status. There is less parent involvement in households where the overall income falls below the poverty threshold (Rush, 1999). Parents within these types of households often have lower levels of education which results in fewer resources to teach their children (Zill et al., 2003). In addition, parents with incomes below the poverty line are more likely than parents of higher incomes to have greater time demands outside of the home (Burchardt, 2008), resulting in less time available to devote to child rearing and parent involvement activities. Research has repeatedly documented that children who grow up in impoverished environments are at increased risk for poor outcomes, especially related to learning (Epstein, 2002). Longitudinal studies have documented negative influences that poverty has on children's academic achievement, cognitive development, and socio-emotional well-being (Allhusen et al., 2005; Brooks-Gunn & Duncan, 1997). Households falling in the lower socioeconomic range typically observe more violence, have less supervision and contact with parents, have less structure, and are

less socially supported (Evans, 2004). The factors above lead to many families with lower socioeconomic status requiring intervention and prevention efforts to assist children's early learning, develop critical skills for early school success, and prevent these children from entering formal schooling unprepared.

Previous Parent-Led Early Literacy Interventions

Parents have been involved in children's early literacy development in a number of ways, including shared reading experiences (Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994) and teaching letter-sound correspondences (Kraft, Findlay, Major, Gilberts, & Hofmeister, 2001). A review of the literature by the National Early Literacy Panel (NELP, 2008) found 32 studies which examined the impact of interventions where parents were involved in learning activities with their child. The meta-analysis conducted revealed that in general, these types of interventions which included parents resulted in moderate to large improvements in children's language and thinking abilities. However, of these intervention studies, only three examined the key early literacy outcomes of alphabetic knowledge and phonological awareness (NELP, 2008). A potential way to best utilize parents' time with their children may be to provide activities for parents to complete with their children that are likely to improve the child's early literacy development in the areas of phonological awareness and alphabetic knowledge.

A pilot study of the intervention program applied within the current study was conducted in the Spring and early Summer of 2009 using a multiple baseline across participants design (Sundman, 2009; Sundman, Bradley-Klug, & Ogg, 2010; Sundman-Wheat, Bradley-Klug, & Ogg, 2012). A group of six parent-child dyads enrolled within

Head Start completed the intervention and effectiveness was examined through both visual analyses and hierarchical linear modeling. For phonological awareness, the children's scores increased an average of 9.20 sounds correct in a minute on the DIBELS First Sound Fluency measure. Although this increase was not statistically significant, it is clinically significant since this increase puts these children as being on benchmark for kindergarten entry. Assessments using the DIBELS Letter Knowledge measure revealed statistically significant increases for child letter naming skills, with five of six children achieving at or above benchmarks for kindergarten entry. Further details of the pilot study are discussed in Chapter Two of this proposal. These results provided support for further examination of this intervention program.

In March of 2009, a research study of a similar model of intervention within the home was published. This study exposed children (ages 4-6 years old) in England to an early literacy intervention within the schools and allowed parents of a subset of children to observe sessions conducted by a trained professional for four weeks (Drouin, 2009). Parents were then allowed to continue the intervention while in the home setting. Follow-up measures up to three years later revealed significant differences between the children who received the intervention with parents observing and children who only received the intervention. This study provides further support due to the potential lasting effect for providing parents with skills to teach their children skills, particularly in the area of early literacy.

Theoretical Foundations of the Early Literacy Intervention Program

The intervention program investigated within this study has its design and implementation rooted in several theories associated with child development and

learning. The intervention is primarily based in the prevention model, which emphasizes providing layers of support to address risk factors which will reduce or eliminate deficits in skills and promote healthy development (Kazak, 2006). The intervention program is designed to be delivered to children who are at-risk for skill deficits in early literacy due to their impoverished background. Provision of a targeted intervention such as the one within this study allows for advancing a child's early literacy skill development and a narrowing of the gap in skills between at-risk children and their "typical" peers.

This intervention program developed also has roots in cognitive-behavioral approaches and ecological systems theory (Bronfenbrenner, 1979). To facilitate skill development of the child, parents scaffold support of both the learning of letter names and the identification of the onset of a word (i.e., phonological awareness). These scaffolding techniques provide support as a child is acquiring skills and reduce support from the adult as the content is mastered. This structure results in enhanced learning and the ability to independently retain and manipulate the information (Vygotsky, 1978). In addition to the use of scaffolding to promote a successful interaction between the parent and child, the incorporation of praise throughout the lesson integrates reinforcement for the child. By reinforcing the child throughout the lesson for both correct answers and effort, the experience is more likely to be perceived as pleasant by both the child and the parent making it more likely that the two will engage in similar interactions around learning again (Cooper, Heron, & Heward, 2007). Establishing this positive interaction around learning at an early age can promote a positive view toward school for both the parent and child, resulting in continued involvement as the child matures.

Consistent with the theoretical foundation for Head Start, the early literacy skill intervention program also draws from ecological systems theory by facilitating learning-based activities within the home environment (Bronfenbrenner, 1979). By integrating parents into the child's life as a teacher, parents learn skills to continue teaching and providing academic support for their children in non-academic settings in later years. Parents may also feel more comfortable participating in their child's education at school, and participating in their child's education through activities such as volunteering in the classroom or communicating with the child's teacher. Engaging in this type of parent involvement has been associated with positive academic and social outcomes for children (Marcon, 1999). In addition, the early literacy intervention program is designed to create positive parent-child interactions around learning which can later serve as a protective factor for children possessing risk factors such as poverty.

Within the framework informed by the prevention model, cognitive-behavioral theory, and ecological systems theory, the intervention program employs two evidence-based practices for teaching the essential early literacy skills of phonological awareness (Sindelar, Lane, Pullen, & Hudson, 2002) and letter naming (Raschke, Alper, & Eggers, 1999). These skills have been identified as key building blocks for reading success at older ages (NELP, 2008; NRP, 2000). By combining early literacy research which informs important skills to target with an intervention framework that promotes parental engagement in education, the goal is that this intervention program results in both short- and long-term positive educational outcomes for the child and family.

Purpose

The purpose of this study was to examine the changes in children's early literacy skill acquisition after receiving an intervention delivered by the child's parents in the home. A second purpose was to examine any changes in the home environment centered around early learning that may have occurred during intervention implementation that could be associated with continued improvements in the child's skills prior to kindergarten entry. With adult literacy statistics showing more than one in ten adults with below basic reading skills (NCES, 2006) and legislation promoting greater parent involvement in education, it is essential to investigate potential avenues for parental involvement that lead to increases in early literacy skills. Greater literacy skills in preschool may lead to a higher likelihood of becoming literate later. This study examined the influence of a parent-led intervention on preschool children's literacy development when compared to children who received only minimal intervention (control condition). In addition, intervention integrity and intervention acceptability were explored since these factors may relate to child outcomes in early literacy. The results of this study contribute to the literature on the creation and implementation of parent-led programs to develop early literacy skills.

Research Questions

The following research questions were examined:

1. What is the level of intervention integrity for the intervention condition? Is there a relationship between intervention integrity and outcomes for the children the intervention condition?

2. Is the intervention program an effective method for improving children's early literacy skills (phonological awareness, letter naming, comprehension and vocabulary/oral language) when compared to a control condition?
3. Is there a relationship between the use of the intervention program and the variety of early learning activities parents engage in with their children?
4. Is there a relationship between the use of the intervention and the frequency that parents engage in early learning activities with their children?
5. Are there differences in ratings of intervention acceptability across intervention and control conditions?

Significance of the Study

Difficulties in reading are common among children in early elementary school resulting in a poor prognosis for future learning. Research has shown that the two most significant predictors of kindergarten success upon entry into school are phonological awareness and letter-naming ability (Blachman, 1994; Daly, Wright, Kelly, & Martens, 1997; Ehri & Roberts, 2006; NELP, 2008; National Reading Panel [NRP], 2000; Share, Jorm, MacLean, & Matthews, 1984). A prevention perspective aims to intervene prior to problems occurring and can assist children to enter school ready to read. Therefore, prevention theory points to beginning interventions early on, such as during preschool. Programs such as Head Start serve as initial prevention efforts to improve child outcomes academically, but increasing parent involvement can provide further support to establish a solid foundation in early literacy skills. Effective interventions can increase parent involvement and children's skills to better prepare children for kindergarten (NELP, 2008). It is essential that strategies, such as the early literacy intervention package

employed in this study, be evaluated for effectiveness prior to recommending further use of this intervention over other parent involvement methods that focus on early literacy skills.

Chapter Two: Review of the Related Literature

Introduction

Literacy is a national concern. A report by the National Center for Education Statistics (NCES) revealed that only 33% of students in the U.S. were at or above a proficient level in reading (NCES, 2009). Beyond this, only 67% of children had achieved a basic level of reading achievement (NCES, 2009). These statistics indicate that the current educational system is not meeting the literacy needs of students, with one-third of students not performing at grade level in reading. Literacy is an essential skill for successful living and fully participating in society (National Early Literacy Panel, 2008). Illiteracy correlates positively with extensive increases in health care costs, likelihood of imprisonment, likelihood of receiving government assistance, and negatively with pay, and consistent work (Arkansas Literacy Council, 2005; Haigler, Harlow, O'Connor, & Campbell, 1994; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993). Therefore, the issue of ensuring that schools provide children with the learning experiences needed to become literate has garnered government attention.

Government Initiatives on Literacy

Legislation addresses the concerns over literacy with a three-pronged approach, by setting expectations for achievement (e.g., No Child Left Behind Act, NCLB), focusing on parent involvement in education (e.g., Section 1118), and promoting prevention efforts (IDEIA, 2004). The NCLB mandates that all schools monitor the

acquisition of basic skills in reading and math to ensure that all children are progressing in their learning. Included in this mandate is a goal that all children will achieve grade level benchmarks in both reading and math by the 2013-2014 school year. This goal was created in the belief that setting high expectations and establishing measurable goals can improve individual outcomes for students. Within the NCLB also is a mandate to encourage and facilitate parent involvement. Section 1118 of NCLB states that schools are responsible for encouraging parents to: (1) assist in their child's learning, (2) be actively involved in education, and (3) be included in making decisions about their child's education.

Focus on Prevention

An additional focus within legislation has been the delivery of prevention activities to all children (U.S. Department of Education Office of Special Education and Rehabilitative Services, 2002). Education law such as the Individuals with Disabilities Education Improvement Act (IDEIA; 2004) have included Response to Intervention (RtI) allowing for prevention efforts to be delivered within a tiered model to alleviate problems. This prevention focus is based upon numerous studies demonstrating a need for skill development efforts to begin prior to formal schooling to allow children to begin kindergarten ready to learn (Barnett, Young, & Schweinhart, 1998; Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 1994; Guralnick, 1997; Reynolds, 2004).

Prevention is a necessary action to address the current standing of literacy in U.S. schools. The National Reading Panel (NRP; 2000) reported that 17.5% of children will experience difficulties in learning to read during the first three years of formal schooling. Children who initially struggle to read are likely to continue to struggle in mastering

higher order literacy skills and also to master these skills at a slower rate, leaving them to fall farther and farther behind their peers. This trend is known as the "Matthew Effect" and this set of circumstances often results in these children avoiding reading due to the stress and frustration associated with reading (Stanovich, 1986). Avoiding literacy activities further reduces these children's opportunities to engage in reading, making it less likely they will become literate later (Duncan, Dowsett, Claessens, Magnusson, Huston, & Klebanov et al., 2007; Torgesen & Burgess, 1998). Further supporting this trend is research which concluded that of all children who experience reading difficulties in third grade, up to three-quarters will continue to demonstrate reading deficits in later grades (Lyon, 1995).

To address concerns regarding children's reading skills, prevention has been proposed as a focus in literacy development. Often, prevention efforts are divided into three levels of prevention, ranging from low intensity to high intensity efforts that prevent problems from becoming worse or prevent related problems from developing (Kazak, 2006). Primary prevention efforts require little time and effort from professionals and typically are available at a low cost to everyone in the community. These efforts focus primarily on promoting child achievement of developmental milestones and may include brochures provided to families with information on important milestones or a book exchange program where families can replace books in their homes. Prevention efforts at the secondary level focus on particular populations that possess risk factors for limited development of early literacy skills. These prevention efforts are more intensive than primary efforts but may prevent families from needing more intensive and costly services in the future. Examples of secondary prevention efforts may include parent education

programs delivered by professionals to groups of families or providing free preschool enrollment for families living in poverty. Finally, tertiary prevention services are reserved for families who have not had success with previous efforts or for children whose skills are significantly behind. Services at this level are typically more costly and should be reserved for only a small portion of the population. These tertiary services may include professionals working individually with families to address specific concerns. An example is the IDEA Part C funding programs which provide services in the home and day care settings to address children's specific developmental delays. By organizing prevention efforts in this tiered manner, resources can be best allocated to meet the early literacy needs of young children.

The Need for Secondary Prevention Efforts

Children who meet criteria to qualify for Head Start have been repeatedly documented to have deficits in early literacy skills compared to same age peers from higher income homes (Mendez, 2010; Zill et al., 2001, 2003). Extensive research has documented a relationship between socioeconomic status and early literacy experiences. Evans (2004) reviewed literature related to parents' income, profession, and education level and consistently found that no matter how the socioeconomic variable was defined, children who live in homes where parents have low socioeconomic status, low professional placements, or less education had poorer environments for learning early academic skills at home as compared to families with average or above average socioeconomic status or education. Children who grow up in families with these factors go to the library less frequently, have fewer words addressed to them, are engaged in conversation less often, are read to less often, and are more likely to be ordered to do

tasks (Federal Interagency Forum on Child and Family Statistics, 2000; Hart & Risley, 1995; Hoff, Laursen, Tardiff, 2002; Kagan & Tulkin, 1971). Over time, these factors combine to detrimentally impact children's exposure to language and print. An additional concern with this limited literacy and language stimulation in the early years is that exposure to literacy activities within the home may have a stronger relationship with children's early literacy success than stimulation provided by the early school environment (Al Otaiba & Fuchs, 2006).

An investigation of families in the Baltimore, Maryland region examined the relationship between income and the types of early literacy activities families engage in with their children (Metsala, 1996). Families who had children in prekindergarten during the 1992-1993 school year composed the sample, drawing from four neighborhoods in the Baltimore area. The neighborhoods had the following compositions: (1) low-income African American families, (2) low-income European Americans, (3) a mix of low-income African-Americans and European Americans, and (4) a mix of middle-income African-Americans and European Americans. Parents in each family were asked to maintain a diary over one week that recorded the activities their child engaged in related to early literacy. In addition to these records, each family was interviewed to probe for engagement in activities that might be related to early literacy that were not recorded within the diary. The language used within the home was examined anecdotally and children from the low-income homes more often heard improper grammar and words used incorrectly than children from middle-income homes. Metsala (1996) hypothesized that this type of exposure to language early on could be related to difficulties in learning to read proper English in the future. Results of the more structured analyses revealed that

early literacy activities were more consistent when families were grouped by socioeconomic status than when they were grouped by race. This may indicate that the socioeconomic status of the home a child is raised in has more of a relation to their early literacy activities than race or cultural factors. In general, middle-income families were found to engage in reading and literacy-related activities as a source of entertainment for their children. However, families with lower socioeconomic status often engaged in activities that may be seen as less engaging and more structured such as reciting the alphabet or using flashcards. Parents in these families also viewed these activities as tasks instead of as enjoyable pursuits.

Rush (1999) examined the early literacy skills of children enrolled in Head Start. Thirty-nine families completed questionnaires and were observed at home. The early literacy skills of children were measured with a number of assessments, including the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981), the Expressive One-Word Picture Vocabulary Test (EOWPVT-R; Gardner, 1990), letters named within one minute, initial sounds of words generated within one minute, and blending individual sounds together. On average across all assessments, children in Head Start were found to score about two-thirds to a full standard deviation below the mean on the standardized measures and also scored below other children on the letter naming and phonemic awareness activities. This is consistent with the findings of national studies using the Family and Child Experiences Survey (FACES), which surveyed children's early academic abilities. Children from low-income homes performed two-thirds to one full standard deviation below the national norms in vocabulary, writing ability, emergent reading skills, and letter identification (Zill et al., 2001, 2003). In addition, Rush (1999)

found that children from low-income homes spent more time in unstructured activities. This is significant because children who were more often engaged in structured activities and played with a caregiver tended to score higher on literacy and vocabulary skills.

An additional study that examined the literacy activities of Head Start families was the Stony Brook Family Reading Survey (SBFRS; Whitehurst, 1992). Parents completed a nine-item multiple choice questionnaire assessing how frequently parents read to their children, the child's interest in reading or being read to, the number of books in the home, and other literacy activities that take place within the home. The Code for Interactive Recording of Caregiving and Learning Environments-2 (CIRCLE-2; Atwater, Montagna, Creighton, Williams & Hou, 1993) was used to assess the home learning environment. The CIRCLE-2 assesses three domains within the home environment: (1) the caregivers' behavior, (2) the ecology of the caregiving environment, and (3) the child's engagement with people and objects within the caregiving setting. The home observation found that a majority of children were rarely engaged in structured activities and spent most of their time watching television, wandering from activity to activity, or engaging in non-interactive play. Additionally, for at least half of the observation period, the caregiver was present while the child continued in unstructured activities around the home. A second notable finding within this study was that despite Head Start preschools offering many literacy-enhancing activities, no parents within the sample indicated that they used these materials within the home. This indicates that a more interactive approach with parents, such as providing training, may be needed to ensure that parents implement the strategies and tools that Head Start programs provide.

Early Literacy Skills

The National Early Literacy Panel (NELP, 2008) defines early literacy skills as those that are predictive of later important literacy skills such as decoding, oral reading fluency, reading comprehension, writing, and spelling. Therefore, these early literacy skills are critical to progress in school and to the achievement of early school success. Success in the early grades, particularly in reading, provides children with the opportunity to continue acquiring skills and learning. However, difficulties in early schooling are problematic since "success in the early grades does not guarantee success in later schooling, but failure in the early grades virtually *ensures* failure in later schooling" (Slavin, 1999,p. 105).

The National Reading Panel (2000) and the National Early Literacy Panel both reported on skills related to later reading achievement. These reports identified phonological awareness and the ability to name letters as predictors of literacy achievement when children enter kindergarten (Blachman, 1994; Daly et al., 1997; Ehri & Roberts, 2006; NELP, 2008; NRP, 2000; Share et al., 1984). Children who have developed these skills before or during the first part of their kindergarten year are less likely to have difficulties in later school years (Stevenson & Newman, 1986). Furthermore, measures on these skills taken prior to kindergarten evidenced strong correlations with fifth grade reading comprehension (r=.60) and decoding (r=.61), and comprehension scores in tenth grade (r=.60; Stevenson & Newman, 1986).

Phonological Awareness. Phonological awareness is the ability to distinguish between the different sounds of spoken language. This early literacy skill develops

through a four-step progression known as word awareness, syllable awareness, onset/rime awareness, and phoneme awareness (Sindelar et al., 2002). The word level of phonological awareness develops very early in children's lives as they learn to separate individual words from the stream of spoken language. The next level of phonological awareness, syllable awareness, develops around the age of three years when most children can detect the "beat" of language, or the separate parts within the word. In the pre-kindergarten years, children develop the third level of phonological awareness, known as onset/rime awareness. At this stage, syllables or words can be divided into smaller parts by separating the first one or two sounds of the word (the onset) from the last sounds within the word (the rime). The highest level of phonological awareness is phonemic awareness, where children can break words or syllables into individual sounds or phonemes and then manipulate them (Daly et al., 2005). Phonemic awareness typically emerges and fully develops throughout the kindergarten year. By the end of the kindergarten year, most children who learn to read easily will show some success if not mastery on tasks assessing this level of phonological awareness (Sindelar et al., 2002).

Teaching Phonological Awareness. Children can complete a variety of activities to learn different levels of phonological awareness and show mastery of this skill. To show division of sounds within language at any level, children can clap their hands or walk to the "beat" within a set of words (Sindelar et al., 2002). Teaching the onset/rime level of phonological awareness can involve having children play "word games" by matching rhyming words (find all the pictures that rhyme with "hat"), or identify whether words begin with the same sound (sat and sip, phone and fun; Sindelar et al., 2002). Other activities used to teach the onset-rime level may include providing the onset and

rime of a word in short segments (i.e., /sh/ - /oo/) and having the child blend the two parts together to make a word or select a picture that the word represents (Lundberg, Frost, & Petersen, 1988). Evidence-based activities that teach phonemic awareness can be quite varied (Vandervelden & Siegel, 1997), but children master these activities in a specific progression (Vandervelden & Siegel, 1995). Developmentally, children who are successful readers in later grades initially master activities that require simple segmentation (e.g., /dog/ to /d/ /o/ /g/) and then simple blends (e.g., /stop/ to /s/ /t/ /o/ /p/). At later stages of phonemic awareness, children can complete activities that require them to practice deletion and substitution of specific phonemes. For example, being able to respond with /soop/ when asked to say /skoop/ without the /k/ sound or changing /kat/ to /hat/ by changing the /k/ to a /h/ sound (Vandervelden & Siegel, 1995).

Letter Naming. The ability to name letters is a skill within the broader area of alphabetic knowledge. Alphabetic knowledge encompasses a number of skills that ultimately lead to children matching spoken labels and sounds with printed letters, or graphemes. Separate skills within alphabetic knowledge include the ability to name graphemes (both upper- and lower-case), the ability to match letters with the sounds they produce, learning that specific sounds require more than one grapheme (e.g., /sh/), and eventually, to understand that letters can be combined to make words, which are constructed of a specific orders of sounds. However, the order that these skills should be taught, and whether learning letter names is an important skill, have been the source of some debate (Adams, 1990). However, most researchers agree that learning letter names is important since research supports a link between knowledge of letter names and future success in reading (National Early Literacy Panel, 2008; National Reading Panel, 2000).

In terms of skill mastery, knowledge of letter names should be taught first as a prerequisite skill to learning letter-sound correspondence (Adams, 1990; Ehri & Roberts, 2006). Several benefits emerge from teaching letter names prior to letter sounds (Treiman & Kessler, 2003). First, the letter name provides children with 26 separate categories to place information about letters, such as the look of both the upper- and lower-case graphemes for each. In addition, this label allows children to talk about letters when reading or spelling words, a task that may be more difficult when using letter sounds as descriptors. A third advantage to teaching letter names first is that many letters produce multiple sounds (e.g., long and short /a/), and some letters can produce the same sound (e.g., s and c). When using the letter name as a category, multiple sounds can be paired with the single label. Fourth, Share (2004) found that children who learned letter names first can learn letter sounds more quickly than children who do not have this knowledge. One explanation for this is that many letter names have the common sounds they produce embedded within the name (e.g., the letter "Z" is pronounced with /z/ at the beginning). Finally, the category of letter names are easier to hear as a label instead of letter sounds (Treiman & Kessler, 2003), making the use of letter names easier for children to recreate.

In terms of when these skills are mastered, letter naming is commonly assessed from preschool through first grade. In total, 52 graphemes have to be matched to the 26 labels for letters. Initially, children may learn specific pairings such as the letters within their name (Justice, Pence, Bowles, & Wiggins,2006), and often find upper-case letters easier to learn first (Worden & Boettcher, 1990). Letter naming is often assessed by examining the fluency with which, or how quickly, children can name the graphemes

(Good & Kaminski, 2002). For children to make adequate progress with this skill in kindergarten, growth must be rapid, with benchmarks at the beginning of the year being 8 letters per minute but moving to 27 by the middle of the year and 40 letters per minute at the end of the year to be considered low risk for later reading difficulties (Good & Kaminski, 2002). Therefore, children who do not begin kindergarten with solid letter naming skills are less likely to meet benchmarks later within the year.

Learning letter names was examined to determine the relationship to learning letter sounds, one of the big ideas in reading (Roberts, 2003). Thirty-three preschoolers (ages 3-4) participated in the study. Children were primarily non-English speaking at home; 20 spoke Hmong, nine spoke Spanish, and four spoke English. All children were enrolled in a half-day preschool provided for low-income families. Two conditions were examined in relation to being able to "read" words. The intervention condition consisted of learning letter names for letters A through P and working on identifying rhymes and the control condition consisted of working on comprehension through storybook readings. For each of the 16 weeks, three 20-25 minute lessons took place. Children in the comprehension condition first viewed a videotape that matched a storybook and then "read" the storybook. In the next two sessions, children engaged in a variety of activities working on vocabulary for the story, using cards with pictures from the story to create a sequence of events, and acting out scenes from the story. As the weeks passed, the complexity and length of the stories grew. The first day of the letter-rhyme treatment consisted of teaching children the alphabet song, having them look at an alphabet book, and then instructing them on rhyming words (i.e., "Cake and lake rhyme"). During the next two days children wrote letters and reviewed letters taught during previous

intervention days. After the intervention, children were assessed for their accuracy on three lists of "words": (a) phonetic letter name spellings (e.g., KND for candy) with letters A-P, (b) phonetic letter name spellings with letters Q-Z, and (3) visually distinctive spellings containing no correlating letters (e.g., Hf for candy). Children trained in letter names performed more accurately on lists with phonetic spellings of letters they were taught than on the other two lists. In contrast, children who received training in comprehension performed significantly better on the lists of visually distinct words. The ability to begin to apply letter names to "read" words was interpreted as indicating development in pre-literacy skills.

Although the results of Roberts (2003) are interesting in the use of the knowledge of letter-names to "read" words, several aspects of this study are problematic. The first concern is whether the ability to examine a combination of letters and say the names in successive order actually equates to early literacy skill development. A second concern regarding this study was the use of experimenter generated measurement tools, with little data provided to support psychometric properties, and few details explicitly stated about how measures were developed and finalized. One final criticism is the lack of discussion regarding why students who received no instruction in letter names performed better on lists of words that possessed no correlating letters to the word students were supposed to answer (i.e., cN for ball).

Teaching Letter Names. The literature offers a few effective methods for how to teach letter names. One method that has been shown to be effective in a case study is incremental rehearsal (Bunn, Burns, Hoffman, &Newman, 2005). In incremental rehearsal, the child names letters that are on flashcards presented to him or her. The

flashcards are presented in a particular order so that a known letter follows an unknown letter and then the unknown letter is presented again. The next three cards contain two known letters and then the unknown letter again. This process repeats with the number of known letters in between the unknown letter increasing up to four. This process is repeated with two unknown letters for each session.

Another process that has been proven effective in research is the use of mnemonics to teach letter names (Raschke et al., 1999). Raschke and colleagues (1999) worked with 10 five and six year old children with varying exceptionalities who were in a self-contained classroom. Prior to the intervention, children knew an average of six letters. For this intervention, children were taught a short sentence that was paired with two letters and an image. One example is a picture of an eye paired with the upper and lowercase versions of "i" and the sentence "This is my eye." The children then had to repeat the sentence and the name of the letter. As children began to master the letter names, the sentence was whispered and the image was gradually removed until no prompt was needed for the child to name the letter. To finish each session, children were instructed to go through flashcards with letters on them and practice using the cues silently. A child was considered to achieve mastery when he or she was able to recall all twenty-six letters correctly, three days in a row. It took children in this sample ten to seventeen sessions to be able to name all the letters accurately (Raschke et al., 1999).

A thorough literature review produced only these two strategies that solely focused on teaching letter names to young children. Although both intervention studies reported acceptable outcomes, the use of the mnemonic intervention was selected for the intervention applied in this current study as it was determined by the study coordinator to

be more parent-friendly and lent itself more easily to the creation of a scripted lesson plan and to use for parent training.

Parent Involvement as a Protective Factor

The inclusion of parent involvement within legislation arises from the numerous studies that have documented the positive impact of parental involvement on children's academic skills, socialization, mental health and adult outcomes. Before examining the outcomes of parent involvement, it is essential to understand what parent involvement activities can consist of and how it is defined within the literature. Broadly, parent involvement can encompass any activities parents participate in regarding their child's education and attitudes the parent holds that impact engagement in educational activities (Epstein, 1996; Marcon, 1999). Though multiple models have been proposed to understand parent involvement, one model that takes into account multiple levels and many factors related to involvement has been put forth by Hoover-Dempsey and Sandler (1995). This model is particularly helpful due to its focus on variables that can be changed through targeted interventions to increase parental involvement. To further understand parental involvement, this model is reviewed below.

Hoover-Dempsey and Sandler (1995) propose that parents initially become involved not because of specific demographic factors such as education status or income, but instead due to an interaction of three factors: (1) the parent's construction of the parental role, (2) the parent's sense of efficacy for helping their child succeed, and (3) the parent's perception of opportunities and demands presented by the child and the child's school. An essential component to a parent becoming involved in a meaningful way is that the parent perceives involvement in education as part of their role as a caregiver. In

addition, efforts at parent involvement are more likely to be attempted if the parent feels efficacious in their parental role and in their ability to assist their child with educational activities. Therefore, parents can be provided with experiences to increase their parenting efficacy such as directly experiencing success in attempting these types of activities with their child. Finally, an initial decision to become involved in educational activities with their child is influenced by the opportunities presented to the parent through the school and interactions with the child. These can include both general and specific opportunities, such as a child being enthusiastic when the parent works with the class or how well-received the parent feels by the school staff when attempting to engage in involvement activities.

After deciding to become involved, parents have a number of options for how to be involved and the extent of time spent in these activities. The Hoover-Dempsey and Sandler (1995) model explains that three specific domains in a parent's life will determine a parent's type and level of involvement including (1) the parent's specific domains of skill and knowledge, (2) the extent and interaction of employment and other family demands, and (3) specific invitations from the school or the child. Parents are more likely to become involved with children in activities where they perceive themselves as having the skills and knowledge to be able to help. For example, if a parent feels competent in his or her ability to speak in front of groups, he or she is more likely to talk in front of the class on career day than a parent who does not feel he or she has these skills. In addition to having skills and knowledge to share, parents' involvement is influenced by the other demands on their time, namely employment and family demands. A parent's availability to engage in educational activities can be

affected by his or her ability or inability to take time off of work, caring for an infant or elderly family member, or the activities and needs of other children who are in school. Finally, a parent's decision for how to become involved can be influenced by specific invitations from the child and school. A child may plead for the parent to come to the school to share a lunch or watch a play, which will lead to a different form of involvement than a child who asks for homework help. In a similar manner, the teacher who invites parents into the classroom at any time will encourage parents to engage in this type of involvement and this would appear different from a teacher who encourages parents to contact her with any questions. The latter invitation is more likely to open lines of communication between the parent and teacher. Other examinations of parental involvement have attempted to categorize the type of activities parents engage in by the location (home-based, school-based, home-school communication; Epstein & Hollifield, 1996), or into active versus passive activities (Marcon, 1999).

The next level within the Hoover-Dempsey and Sandler (1995) model shifts to focusing on the mechanisms of parent involvement that positively influence child outcomes. Increased parent-child interactions around educational topics are thought to be beneficial by parents' use of modeling, reinforcement, and instruction. Parent involvement in educational activities shows children that school and related activities are worthy of time and through these interactions, parents model positive attitudes and beliefs regarding school. Although modeling is an excellent way to teach young children about the importance of education, it is not sufficient to assist a child in gaining the range of academic, behavioral, and social skills required to be in school. Learning essential skills in these areas can be accomplished through direct instruction. Instruction can be

either open-ended or close-ended and both types have benefits. Close-ended instruction involves teaching children the right way to do specific tasks, such as correctly spelling a word or how to solve a math problem. Open-ended instruction has children plan or explain their thinking and work, leading to higher levels of cognitive complexity. Open-ended instruction might involve having a child plan how to break down a large task or generate their own formula for solving a problem. An additional enhancement to learning outcomes for children is the reinforcement a parent uses related to school activities. A parent can utilize a variety of reinforcers when working with their child ranging from attention to tangible rewards given for desired behaviors. It is likely that engaging in activities with the child related to school is in itself reinforcing because children are often reinforced by adult attention. However, neither instruction nor reinforcement can fully predict educational outcomes of a child.

The effects of parental involvement on child outcomes are suggested to be mediated by two factors: (1) the parent's use of developmentally appropriate involvement activities, and (2) the match between the parent's activities and the school's expectations for involvement (Hoover-Dempsey & Sandler, 1995). Engagement in parental involvement is more likely to have a positive impact if the parent chooses teaching strategies and sets expectations for the child that are developmentally appropriate. It is likely that the use of strategies that do not fit the child's needs will negate any positive effects of the interaction between the parent and child and may actually have a negative impact on the child and their views of school. As children grow, the avenues that parents are allowed to become involved in may change as the child expresses preferences for different types of interactions with their parents around school. A second mediating

variable is the match between the parent's level and type of involvement and the school's expectations for parental involvement. The more consistent these two are, the more enhancing parental involvement can be on children's educational outcomes. In the case where the fit between the two is poor, children must spend more of their resources on negotiating the two sets of expectations, which can limit the child's ability to learn new tasks.

Empirical studies have examined the Hoover-Dempsey and Sandler (1995) model for parent involvement in whole or part in relation to child outcomes. In examining the relationship between parental involvement and poor mental health, Flouri and Buchanan (2002) found that adolescents who reported higher levels of parents' involvement in their lives were also less likely to report having made a suicide attempt. Long-term outcomes of the level of parental involvement during elementary school have also shown positive results when examining the sample from the National Child Development Study (Flouri & Buchanan, 2004). The longitudinal data collected on this sample consisted of both mother's and father's level of involvement when children were seven years old, general academic ability at age 11, and self-reported academic motivation of the student at age 16 as predictors of whether a child would have graduated school by age 20. Only participants that had data available for all variables were included in the regression equation, resulting in a sample of 3,303 families. Results of the analysis suggested that parental involvement of the mother and the father at age seven predicted the educational achievement at age 20 independent of one another. No significant effects were found for the gender of the child, indicating that parental involvement by either parent is equally beneficial for male and female children. In addition, academic motivation at age 16 did

not mediate the relationship between either mother's or father's involvement and later academic achievement (Flouri & Buchanan, 2004). Since the gender of the caregiver did not factor into children's long-term outcomes, and children with two parents that were involved in education had better outcomes, activities to increase parental involvement should encourage parents of both genders to participate in the child's education.

Research also has linked parental involvement to promotion of skill development in young children. However, these results are not always consistent. In examining social outcomes, Marcon (1999) gathered teacher ratings of parental involvement during preschool for 708 predominantly low-income families. For each child within their class, teachers answered four questions (yes-no) regarding the level of family involvement. The four questions assessed contact with the school in the following forms: (1) attendance of a parent-teacher conference, (2) home visit by the teacher, (3) extended class visit by the parent, and (4) helping with class activities. The ratings for each parent were classified into low, median, or high levels of involvement and also classified into active types of involvement (e.g., assisting with class activities) and passive involvement (e.g., receiving a home visit). Data on children's socialization and adaptive skills were gathered from teachers by having them complete the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1985), which gathered information on communication, daily living skills, socialization, and motor development. Information on children's academic performance was gathered from their report cards. Grades were given for mathematics/science (number experiences, science experiences), verbal skills (reading preparation, listening and speaking, literature), social skills (work habits, social

development), and physical development. The subdomains for each larger domain are contained within the parentheses.

Results showed that teacher ratings of parent involvement were significantly related to teacher ratings of children's overall development. In particular, children of parents that had high parent involvement ratings were more likely to have higher ratings of personal and community skills indicating better adaptive skills and social behavior. Children with greater levels of parental involvement also evidenced higher language development and emergent academic skills. The greatest effect sizes for parental involvement in academics was in the domains of verbal skills, social skills, and work habits. The effects of parental involvement were stronger if the activities included in the analysis represented "active participation" of parents (i.e., volunteering at the school, assisting with a class activity). In addition, differences were found for how parental involvement impacted boys and girls. Across most categories, parental involvement typically had more of a positive impact for boys than girls.

Although these findings support the positive impact of parent involvement, the Marcon (1999) investigation contained several limitations which must be considered when interpreting the results. The primary limitation within this study is that the data all emanate from a single source- the child's teacher. The results of the correlational analyses may reflect a consistent opinion of the child and family by the teacher and not a true relationship between parental involvement and children's development. In addition, parents who were more involved may have been more involved because their child started the school experience doing well. Child initial performance in all assessed domains would have allowed for control of this variable within analysis.

Although Marcon (1999) indicated a positive relationship between parental involvement in the early school years and skill development, Powell and colleagues (2010) did not reveal a positive influence of parental involvement across all domains. A sample of 140 pre-kindergarten children in the Midwest participated in a study examining children's early literacy, early mathematics, and social skills in relation to type and level of parental involvement. Children's skills were assessed with the Peabody Picture Vocabulary Test-Third Edition (PPVT-III; Dunn, Dunn, & Dunn, 1997) and letter-word identification and applied problems subtests of the Woodcock-Johnson-Third Edition Tests of Academic Achievement (WJ III-Ach; Woodcock & Mather, 1989, 1990). Children's social skills were rated by the primary classroom teacher who completed the Social Skills Rating System (SSRS; Gresham & Elliott, 1990). Parental involvement at school and within the home was gathered from the Head Start Family and Child Experiences Survey (FACES; O'Brien et al., 2002), which consisted of parent responses to 20 questions on parental activities centered around education. Finally, interactions between the teacher and the child while in the classroom were rated by an independent observer completing the Arnett Caregiver Interaction Scale (CIS; Arnett, 1989), which assesses the classroom teacher's warmth, attentiveness to individual children, and developmental appropriateness of communication on a 1-4 scale.

Results showed a significant negative correlation between parental school involvement and child ratings of behavior problems, indicating that parents who reported higher levels of school involvement had children who received lower levels of problem behaviors. A positive relationship was found between parental school involvement and ratings on social skills. In terms of academic outcomes, a statistically significant positive

correlation was found between scores on the mathematics assessment. However, in examining the relationship of parental school involvement and both of the early literacy measures, neither was statistically significant but both were in the positive direction. In addition, parental home involvement was negatively related to all academic outcomes, meaning that as parental involvement in activities at home increased, child performance on all academic tasks (both literacy and mathematics) decreased. These unexpected relationships may indicate a problem with the design of this study in terms of the measurement of home involvement reported by parents. The assessment of home involvement consisted of nine very specific activities and their reported frequency of being engaged in during the past week. The scores across each of these items were then averaged, combining the answers to the math-based activities (e.g., counting objects) with the literacy-based activities (e.g., reading to the child). By combining these items across pre-academic skills areas, the strength of the relationship may have been compromised.

In an effort to examine the general impact of parental involvement on children's academic outcomes, Fan and Chen (2001) conducted a meta-analysis of 25 empirical studies that examined the relationship between parental involvement and children's academic achievement. Due to the variety of parental involvement definitions across studies and the number of different academic outcomes measured, studies were coded on several variables for analysis: (1) average age of children, (2) ethnicity of participants, (3) measure of achievement, (4) area of achievement, and (5) parental involvement dimensions. The measures of achievement were divided into school grade point average (GPA), tests, and other rating forms (i.e., teacher rating, grade retention). Areas of

achievement included math, reading, science, social studies, general achievement, and other (i.e., music). Finally, parental involvement had five codes: (1) educational expectation/aspiration for children, (2) communication with children about school-related matters, (3) parental supervision/home structure related to school matters, (4) parental participation in school activities, and (5) other/general parental involvement. Results of the general linear model analysis revealed that the strongest moderating effects on the relationship between parental involvement and academic achievement were the parental involvement dimensions, area of academic achievement, and age. These results indicate that the relationship between parental involvement and academic achievement should not be generalized across studies using different definitions of parental involvement, or the separate areas of academic achievement.

When relationships were analyzed separately, correlations between parental involvement and general achievement measures were higher than those for studies examining specific areas of achievement. Since general achievement measures (such as GPA) are a composite of separate components, it is likely that this type of measure is more reliable and would yield a stronger relationship than the achievement in separate subject areas that would combine to yield the general measure. An examination of the separate dimensions of parental involvement revealed that the strongest relationship to student academic achievement is with parent's educational expectation/ aspiration for children. Following this relationship, the next strongest relationships were present with parental participation in school activities, other/general parental involvement, and communication with children about school-related matters. The final code of parental supervision/home structure related to school matters yielded a lower correlation. Further

analysis using a study-effects method of meta-analysis which inputs only one effect size from each study into a meta-analysis revealed an overall positive relationship of medium strength between parental involvement and academic achievement (Stevens, 1990). These findings indicate why there may be some variability within individual studies based on how the specific variable of achievement and parental involvement are defined. However, increasing parents' involvement in their children's education does appear to have the desired effect. The single caveat to the Fan and Chen (2001) meta-analysis is that the majority of studies included in the analysis examined a school-age population (grades kindergarten-12) and this relationship may not show the same strength when examined at the preschool level. In fact, a review of the literature revealed that little information is available regarding studies that examine parent involvement in preschools (Arnold, Zeljo, Doctoroff, & Ortiz, 2008).

Taking the parent involvement models and the research conducted applying these models into account, the early literacy program within this study can be envisioned as a direct invitation to parents to become involved in their child's education within the home setting. The program was designed to be efficient with respect to both training and implementation, reducing the potential barrier of time. Parents are provided support to complete activities with their child by having easy to follow lessons and ongoing access to the study coordinator for any questions. Parents completing the early literacy skill program are actively engaged in a teaching role with their child as the primary interventionist.

Parents as Interventionists

When parents choose to become involved in their children's academic lives, a new avenue for delivery of interventions is paved by using parents as interventionists to prevent and remediate learning concerns. Parents are natural resources to include as interventionists. During the early childhood years, children spend a significant amount of time with their parents (U.S. Census Bureau, 2002). Involving parents in the delivery of interventions provides them with a meaningful role in enhancing their child's education and, if done successfully, could lead to increasing parent involvement by (1) increasing parent's feelings of efficacy on these academic endeavors and (2) providing parents with skills related to teaching and communicating information to their child. Additionally, if parents receive a specific invitation to become involved in preparing their children for later schooling, as was done with this study, the parent may choose to become involved in a new way they had not previously thought about by completing activities targeting specific skills important for later literacy outcomes. Prior to examining the use of involvement to target specific skills, it is important to examine the potential benefits of involving parents and also acknowledge common barriers to using parents as interventionists.

Benefits of Parental Involvement

Training parents to deliver interventions yields many benefits over other methods of service delivery. First, parents are major stakeholders in their children's education (Christenson & Buerkle, 1999). In addition, utilizing parents to deliver interventions allows for ample opportunities to practice new skills in multiple settings (Woods, Kashinath, & Goldstein, 2004). Gang and Poche (1982) described several other benefits

of using parents to deliver interventions including cost effectiveness, convenience of in-home intervention, the ability to immediately modify interventions when necessary, allowing a child to remain in the classroom during instruction, and potentially benefiting other children in the family. The participants in Gang and Poche's (1982) study were enrolled in elementary school; however, these same benefits can be applied to children who are preschool age.

Barriers to Parental Involvement

Despite the benefits of parents becoming involved as interventionists and the efforts taken to understand how to promote parent involvement in general, there are still a number of barriers parents face when they are making the decision to engage in activities related to their children's education. In examining the parenting involvement model of Hoover-Dempsey and Sandler (1995), if parents do not possess the feelings of efficacy to help their child, do not perceive opportunities to become involved in school or at home, or do not consider involvement in education as part of their role, these all represent barriers to involvement. For example, a view common within some Hispanic communities is that the teacher is the authority on learning and should be in charge of the child's education; parents who attempt to take on a teaching role are interfering (Espinosa, 1995). First, the barriers to general involvement are discussed, followed by the barriers identified within the research literature for parents becoming interventionists.

Mendez (2010) developed an intervention for families enrolled in Head Starts focusing on increasing parent involvement, improving the parent-teacher relationship, and enhancing children's school readiness. As a component of the evaluation, data were gathered on parents' engagement, satisfaction with the program, and barriers to

participating. The Companion Curriculum (TCC) was delivered throughout the year and consisted of four separate components: (1) staff training on TCC topics and promoting involvement, (2) the use of Family Corners in Head Start centers that contain culturally relevant material that is related to the theme for TCC, (3) provision of educational activities for families to promote positive interactions around education in the home, and (4) demonstration by staff of how to use learning activities in the home at the monthly workshops. Three cohorts of parents were recruited from four Head Start programs, resulting in approximately 280 families participating in the study. Overall, attendance at workshops was highest for the first and last workshops, especially after a graduation celebration was added to the final session. In terms of attendance overall, numbers were very low when compared to the number of eligible parents who could attend the workshops. Across the cohorts, the attendance data ranged from going to no meetings (approximately 18% of parents) to attending all nine meetings (approximately 1% of parents). Parents who were less likely to attend meetings had lower levels of satisfaction with the program, lower monthly income, and higher ratings of depressive symptoms. Other barriers cited by parents were having a work or education schedule that conflicted with meetings, transportation issues, and being too tired. These barriers are consistent with problems in holding activities where all parents must schedule to be present at one time. Therefore, providing activities to be completed at home can overcome some of these difficulties and allow parents to still be involved.

The barriers to parental involvement may be many, but school staff need to be aware that most parents do want to become involved in their child's learning. In schools with a number of risk factors for low involvement (i.e., low socioeconomic status, urban

area), parents are still responsive to opportunities that are provided to maintain or enhance their ability to parent their children and to help them learn (Howland, Anderson, Smile, & Abbott, 2006; Young, Davis, Schoen, & Parker, 1998). In addition, specific actions can be taken to reduce barriers by offering a variety of activities for parents to engage in at home and at school.

There are potential barriers that may need to be confronted when asking parents to deliver interventions. Within the literature, some of the identified barriers include parents lacking knowledge of instructional techniques, not possessing knowledge of activities to increase learning at home, or lower self-efficacy of the caregiver related to specific academic areas (Fiala & Sheridan, 2003; Persampieri, Gortmaker, Daly, Sheridan, & McCurdy, 2006). In addition, if parents do not perceive it is within their role to educate their children in early literacy skills, this can serve as another barrier (Anderson, Cronin, & Fagan, 1998).

Several studies have documented that with appropriate training and follow-up support, parents can overcome barriers and effectively implement interventions (Duvall & Ward, 1997; Gang & Poche, 1982; Weiner, Sheridan & Jenson, 1998). To examine the effectiveness of caregivers at delivering instruction, elementary-aged children who were home-schooled by their caregivers were compared to children enrolled in public schools (Duvall & Ward, 1997). Differences between the two groups were calculated based on differences in learning rates, level of academic engaged time, and performance on standardized academic tests. Four children with learning disabilities who were being home-schooled were matched on demographic factors and Woodcock Johnson-Tests of Academic Achievement-Revised scores with students enrolled in a public elementary

school. Parents who were home-schooling their children received basic support consisting primarily of materials provided by the home-school coalition. Results revealed that students who were home-schooled out-performed children in public school on standardized tests in math, reading, and writing. Home-schooled students had significantly larger rates of growth, which is most likely related to their higher levels of academic engaged time. In fact, students who were home-schooled by their caregiver had rates of engagement that were two and a half times higher than their matched peers.

A home-based intervention for preschool children with a significant literature base is dialogic reading (Mol, Bus, de Jong, & Smeets, 2008; NELP, 2008). Dialogic reading is a shared reading intervention between a child and parent that applies specific strategies to engage the child in the book reading process (Whitehurst, 1994. These strategies include asking questions related to the text or pictures, providing feedback to the child, and introducing information the child knows to the story. A meta-analytic review of 16 research studies employing dialogic reading, with outcomes on 626 children between 2-6 years old, found that exposure to dialogic reading explained approximately 4% variance in all child outcomes (Mol et al., 2008). When child outcomes were restricted to expressive vocabulary only, the explained variance in outcomes increased to 8% for dialogic reading interventions, which yielded a moderate effect size (d= .59, p<.001). An analysis of moderating variables revealed that dialogic reading was associated with better outcomes for children who were enrolled in preschool compared to kindergarten, and for children from households with average or above average maternal education and/or income (Mol et al., 2008).

Murad and Topping (2000) also had parents implement a reading intervention in the home for children in Brazil. Forty-six children, ages 6-7 years old, and their caregivers were divided into an experimental and a control group that were similar in terms of number of participants, ratio of gender, and pre-test reading comprehension and fluency scores. Each parent-child dyad in the experimental group completed a "paired reading" intervention which consisted of reading a book together for at most ten minutes, on five days of the week, for eight weeks. The intervention involved letting the child choose any text that was of interest to them and having caregivers apply a specific correction strategy allowing for self-correction of words that were missed. The paired reading intervention also incorporated praise and discussion of the text and images within the book. During the first two weeks of the intervention, caregivers conducted the intervention in the school so that caregivers could be observed and given feedback. During this time, videos displaying correct paired reading techniques were shown to parents. Children's skills in reading comprehension were assessed by having children read a book using the paired reading technique with a researcher and having the child answer basic questions on the story where their responses were coded using a point system (0-2). Fluency was calculated using the total time taken to read the story and the amount of time the child spent reading alone. Results showed that there were no significant differences between groups in terms of fluency at post-test, although the paired reading group showed greater fluency when reading alone. Regarding comprehension, children in both groups showed growth from pre-test to post-test, but the children in the paired reading condition had significantly greater growth especially when examining scores on the questions pertaining to the story's events and on how the story

ends. In addition to child outcomes, caregivers' attitudes toward the intervention were assessed using a 13-item survey. Results of the survey revealed that after implementing the intervention, more caregivers felt confident in reading with their child, were more willing to read with their child, and reported improved behavior and mood at home. In addition, all caregivers indicated that they would continue the intervention, indicating they felt the intervention was useful and effective in working with their children. This final question tapped an additional important construct in developing and implementing an intervention: intervention acceptability.

Intervention Acceptability

Intervention acceptability has been defined as the judgments of potential implementers that the treatment is fair, appropriate, and reasonable for the problem (Kazdin, 1980). A consistent, research-based model of intervention acceptability has yet to emerge from the literature (Brown-Chidsey, Steege, & Mace, 2008; Elliott, Witt, Kratochwill, & Stoiber, 2002). However, Witt and Elliott (1985) put forth a model of intervention acceptability, which examined the interrelations of four components: (1) acceptability, (2) use, (3) integrity, and (4) effectiveness. The initial stage of the model involves examining acceptability, for the reason that interventionists are more likely to implement interventions that are deemed acceptable compared to interventions that receive lower ratings on acceptability. Wolf (1978) indicated that interventions that are not perceived as acceptable are likely to lead to avoidance by implementers and children, making all other aspects of the intervention (i.e., effectiveness, ease of use, efficiency) irrelevant points.

Beyond initial feelings of acceptability, interventions must be used for the implementers to make reliable statements about the acceptability of the procedures employed. Intervention integrity, which will be discussed separately below, is a third related component. In the same way that an acceptable intervention is more likely to be used, it is believed that acceptable interventions will be completed with more integrity than those that are found unacceptable. The integrity with which an intervention is completed has also been shown to have a positive correlation with outcomes (Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993). An intervention that is implemented as planned, or with integrity, is more likely to result in positive changes in the problem targeted, or the effectiveness of the intervention. If the intervention creates changes equal to or beyond the level of effectiveness expected by the implementer, the intervention is more likely to be rated as acceptable (Witt & Elliott, 1985).

Examination of intervention acceptability within the research literature has yielded several findings, which should be considered when designing an intervention to be used by others. An examination of implementation of the First Step to Success (Walker et al., 2001) curriculum revealed that teachers were more reluctant to use the intervention if children were not exhibiting a need, such as showing externalizing behavior concerns (Golly, Stiller, & Walker, 1998). Therefore, clearly communicating the need to implement the intervention for a child or group of children should be one component to increase acceptability of any intervention.

Intervention Integrity

The integrity of intervention implementation is vital to determining the effectiveness of an intervention. Intervention integrity is often defined as how well the

steps of the original intervention protocol are followed when the intervention is completed (Roach & Elliot, 2008). A thorough review of the literature has found that there is a moderate correlation (r= .51-.58) between intervention integrity and intervention outcomes (Gresham et al., 1993). Therefore, any examination of an intervention's effectiveness is incomplete without a measure of intervention integrity.

Determining whether an intervention is delivered with integrity cannot be answered in a dichotomous way, and instead has been broken down into three components: (1) intervention adherence, (2) interventionist competence, and (3) intervention differentiation (Perpletchikova & Kazdin, 2005). The concept of intervention adherence covers what is traditionally thought of as intervention integrity and focuses on how closely the specific steps of the intervention are followed. Interventionist competence encompasses factors such as the implementer's skills, decisions, timing, and judgment during implementation. Finally, intervention differentiation refers to whether or not and how the intervention is kept distinct from other intervention practices. This final component is essential to determining the full impact of an intervention since other factors, which may also impact the desired outcomes, must be accounted for.

Intervention integrity for interventions completed in homes can be enhanced through two main components. The first is sufficient training and feedback for parents on how to implement the intervention (Persampieri et al., 2006). While several modes of training are possible, the most successful training methods involve direct instruction, such as modeling and providing immediate feedback (Sterling-Turner, Watson, Wildmon, Watkins, & Little, 2001). A second component which improves intervention integrity,

involves monitoring the procedures, which can be completed by using procedural checklists, videotaping sessions, and phone calls (Hook & DuPaul, 1999; Powell-Smith, Stoner, Shinn, & Good, 2000).

Parents have been taught to effectively implement a reading intervention at home for students in third grade (Gang & Poche, 1982). The mothers of three boys whose reading skills were below grade level were taught to implement a phonics-based reading intervention. The intervention sessions were designed to be carried out four times a week for seven weeks (28 sessions total). Through modeling and face-to-face instruction, parents were taught about how students learn reading skills and what environments are conducive for implementing the intervention. During initial sessions, an observer was present to provide corrective feedback. Once parents maintained at least 90% accuracy in implementation as measured through procedural checklists, the observer was gradually removed from sessions. Throughout the intervention, parents were able to maintain a high level of intervention integrity, with an overall average across the three parents and 28 sessions of 97% accuracy. In examining the relationship between the integrity of the intervention and outcomes, two of the students showed rates of growth in reading skills that were greater than their mainstream peers. The third student evidenced gains that were equal to mainstream students. The authors noted that in the case of the third student who did not demonstrate the larger gains, his post-test scores could have been impacted by the fact that on the morning of the post-test he did not take his medication for hyperactivity and inattention. Overall, the results support that parents can implement evidence based interventions at home with high levels of integrity, which lead to positive outcomes for their children.

Parent-Led Early Literacy Interventions Conducted in the Home

One study conducted in England exposed students to an early literacy intervention for four weeks with different levels of intensity for the parent involvement and examined outcomes over two years (Drouin, 2009). A total of 48 children received the early literacy intervention within their preschool. The intervention was carried out over eight sessions that lasted 45 minutes each. The intervention time was spent focusing on 15 minutes of letter sound training, 10 minutes of joint storybook reading, 10 minutes of practice writing the child's name, 5 minutes of rhyme games, and 5 minutes of word recognition. All intervention sessions were delivered by a trained former preschool teacher. The children who received the intervention were in one of two groups: (1) a parent training (PT) group composed of 30 students, and (2) a no parent training (NPT) group composed of 18 students. There was also a control group (C) of 29 students.

The PT group (1) observed all eight sessions the teacher had with the child focusing on early literacy, (2) completed short home activities with their child such as letter writing worksheets, and (3) was encouraged to use the early literacy intervention model they had observed to continue the intervention within the home. In the NPT group, parents received an instruction sheet and material list after their child had finished the intervention within the preschool setting and completed all worksheets with the teacher. The sheet provided details about the activities completed within the intervention and encouraged parents to use these strategies at home. The control group (C) did not receive the intervention in the preschool and parents of these children received a letter describing their children's early literacy skills compared to other children in their preschool and *no* suggestions for activities to complete with their child. Children were

randomly assigned to the control group from either of the two preschools. However, assignment to the two intervention groups was based on preschool (i.e., one preschool was a PT preschool and the other was a NPT preschool).

Child outcomes were assessed via a number of measures, which increased in skill level over the two-year period. Children were initially assessed prior to the intervention on their letter sound knowledge, ability to identify first sounds, their vocabulary (using the British Picture Vocabulary Scale [BPVS]; Dunn, Dunn, Whetton, & Pintilie, 1982), and their intelligence quotient (IQ) using the Wechsler Preschool and Primary Scale of Intelligence- Revised (WPPSI-R; Wechsler, 1989). It is important to note that in England, letter identification instruction often begins with a focus on sounds and not names, a practice that is opposite from most American teaching, and this explains the use of letter sound knowledge as an outcome. At Time 1, immediately following the intervention, children completed the same letter sound and first sound measures. One year after the completion of the intervention (Time 2), all children were assessed again with measures of letter sounds, ability to identify first sounds, blending tasks, phoneme segmentation, and the Reading subtest of the Wechsler Objective Reading Dimensions (WORD; Wechsler, 1993). Two years after the intervention was completed, measures were again completed (Time 3). At this time point, children completed assessments of letter sounds, first sound identification, blending, phoneme segmentation, the Reading subtest of the WORD (Wechsler, 1993), the Spelling and Listening Comprehension subtests of the Wechsler Objective Language Dimensions (WOLD; Wechsler, 1996), the BPVS, and the Sentence subtest of the WPPSI-R. At Time 3, parents and teachers also

completed surveys assessing parent changes to the home-literacy environment and teacher perceptions of the child's overall school progress.

Initial measures did not reveal any significant differences between groups. At Time 1, after the intervention, both the PT and NPT groups showed significant growth in the measures of early literacy. These gains were equivalent across intervention groups. At the one-year follow-up, both intervention groups performed better than the control group on producing letter sounds and identifying first sounds of words. The PT group also performed significantly better than the NPT group on measures of producing letter sounds, identifying first sounds, and blending tasks. At the two-year follow-up, both the NPT and PT groups outperformed controls on a measure of reading ability. However, the PT group also outperformed the control group on measures of letter sound identification, identification of first sounds, blending, phoneme segmentation, and spelling. A comparison of the PT and NPT groups revealed that the PT group performed significantly higher on Reading and Spelling subtest scores of the WORD and WOLD, respectively at the final follow-up. In addition, teacher ratings of child's progress in reading, writing, and overall literacy were significantly different between the PT and Control groups, a finding that was not significant when examining the comparison of the NPT and Control groups. Parent surveys of the home literacy environment revealed that parents in the PT condition were significantly more likely to use educational materials in the home and to direct their child toward literacy activities than parents in the NPT or Control groups. No significant differences were found between the NPT and Control group parent ratings. These findings support both the effectiveness of the intervention and the extended gains

that can result from providing parents with training and tools to engage in early literacy activities within the home.

Since the Drouin (2009) study is closely related to this study design and analysis, a discussion of limitations within the Drouin (2009) study and the differences between these studies is beneficial. An initial problem with the Drouin (2009) study design is that assignment to groups was not entirely random. Even though no differences between groups were found in the data collected initially, other differences between the preschools and their curriculum could account for the differences observed between groups. A second issue is the clinical significance of some of the statistically significant group differences. Some of the statistically significant findings represented only a small difference between scores, for example a difference of being able to identify 24 letters versus 26 letters. The clinical significance of this finding may not be as powerful as the statistical one. Finally, all children came from middle-income families where they were enrolled in full-time preschools in England. These results may not generalize to other populations, which differ from the participants in the study.

Several differences are important to note between this study and the Drouin (2009) study. The first is the extensive training of the parents in the PT group compared to the minimal parent training provided within this study. Parents observed six hours of interventions prior to taking responsibility for working with their child at home. While this resulted in positive outcomes, for many families, taking the time to observe six hours of work over four weeks may require them overcoming many barriers. These barriers can include transportation and time away from work among other obstacles. In addition, these barriers are particularly salient for families from lower income homes such as the

families served by Head Start. This study instructed parents on the intervention in approximately one hour and provide support via phone contact as needed. An additional difference between the studies is that caregivers within this study delivered the scripted intervention only, with no instruction given to the child by a trained professional or experimenter. This ensures that differences seen in the child's early literacy skills are a result of the caregiver's efforts and not due to interaction with professionals. Additionally, the Drouin (2009) study did not gather information regarding integrity and acceptability of the intervention or collect information regarding the specific activities conducted at home. This study addressed these limitations by (1) specifically documenting activities that were completed at home, both through the scripted lesson plans and through caregiver report of engagement in additional activities, (2) observing one lesson plan being carried out to examine adherence to the planned intervention, and (3) examining the intervention acceptability as rated by the caregivers who completed the intervention.

Summary of the Literature

National assessments of children's progress in reading still provide evidence that schools are not meeting the needs of children to assist them in becoming literate (NCES, 2009). To better assist children, both research and legislation are beginning to focus on early learning and prevention of problems. Reviews and meta-analyses of the current research literature in reading yielded important information on what skills are necessary for children to acquire the ability to read within the early school years (NELP, 2008; NRP, 2000). Two indicators of future reading success upon entry into kindergarten are phonological awareness and letter naming (NELP, 2008; NRP, 2000). Equipped with

this knowledge, teachers and parents can prepare children in preschool for early success in reading by using evidence-based strategies to target and develop these skills. Although teachers have the training to teach children skills, parents may need more assistance outlining how to become involved (Hoover-Dempsey & Sandler, 1995). The available research on parent involvement and parents as intervention agents provides guidance to develop a scripted program, using evidence-based teaching strategies, that parents can implement within their homes to facilitate learning in multiple environments for the child. When new interventions are put into place, it is imperative to examine not only the effects of the intervention on children's skills, but also to examine factors that may impact effectiveness, such as the acceptability and integrity of implementation. The intervention program was previously piloted with a group of parents from Head Start and the design and results of the pilot study are summarized below.

Pilot Study

An initial study of this intervention program was conducted in the Spring and early Summer of 2009 (Sundman, 2009; Sundman et al., 2010; Sundman-Wheat et al., 2012). Six parent-child dyads piloted the program in a similar format to the intervention proposed to be used within this research. A multiple baseline across participants design was used to evaluate the intervention, which included baseline, intervention, and follow-up phases. Information on children's phonological awareness and letter naming skills was collected semiweekly throughout the three phases, intervention integrity data were collected throughout the intervention phase by examining lesson plan completion, and intervention acceptability data were collected during the follow-up phase through the use of the Intervention Rating Profile and a semi-structured interview. Children's early

literacy skills were assessed using the First Sound Fluency (Cummings, Good, Kaminski, & O'Neil, 2007) as a measure of phonological awareness development and Letter Knowledge (Good et al., 2004) as a measure of letter-naming fluency.

The results of the pilot study revealed that four of the children showed improvement in phonological awareness and five children demonstrated improvement in letter naming abilities. However, all children evidenced a pattern of increasing average scores across each phase, while growth across phases showed some variation. To better analyze the data, hierarchical linear modeling was used to examine the immediate and long-term changes related to the intervention. Two comparisons were made: (1) immediate change from the end of the baseline phase to the initiation of the intervention phase, and (2) change from the projected baseline to the start of the follow-up phase.

Within the analysis, no significant differences were found in phonological awareness in either comparison. Although no statistically significant differences were found, several clinically important findings in phonological awareness emerged. An average increase of 9.20 first sounds was found between baseline and follow-up phases. The average rate of growth between baseline and the intervention phases of 0.21 was higher than the documented standard found in a preschool population of 0.10 first sounds per day (Cummings et al., 2007). Three students evidenced rates of growth indicating they were able to produce, on average, an additional sound per minute every two days. However, this improvement, combined with the performance of the other participants, did not yield significant differences in the HLM analysis.

In the area of letter naming, the second comparison revealed that five of the six participants were able to identify the minimum number of letter names to be considered

in the Low Risk category for the Fall assessment of this skill in kindergarten (8 letters; Good & Kaminski, 2002). Placing context to this, if a child began knowing no letter names, completing this intervention and maintaining the level of performance at the start of kindergarten would place a child into the Low Risk category. Based on the baseline performance of these children, it is hypothesized that most would not reach the Low Risk benchmark at the start of kindergarten without intervention. The shift in level of performance is meaningful because children who fall in the Low Risk category at the first benchmark have an 80% chance of achieving the second benchmark (Cummings et al., 2008), making it less likely that these children will struggle with early literacy skills at a later date.

In addition to examining effectiveness for increasing early literacy skills, the intervention was also examined for implementation integrity and acceptability and how these constructs related to early literacy outcomes. According to parent reports via completion of the lesson plans, the intervention was completed with a high level of integrity by most parents. Four parents completed over 90% of the lessons (98.84%, 94.84%, 94.73%, and 94.19%), one parent completed 87.78% of the lessons, and one parent completed 55.31% of the lessons. The relationship between weekly completion of lessons and child scores was statistically significant (phonological awareness r=0.27, p= 0.04; letter naming r=0.31, p= 0.02). In terms of intervention acceptability, ratings on the Intervention Rating Profile (IRP-13) were between 70-77 with a mean of 73.83, indicating high rating of acceptability. The relationship between a child's early literacy scores and parent rating of acceptability was found to be non-significant (phonological awareness r=0.36, p= 0.48; letter naming r=-0.69, p= 0.13). These non-significant

findings may be partially attributed to the narrow range of acceptability scores and small sample (Glass & Hopkins, 1996). Within the semi-structured interview, high ratings of acceptability were confirmed by parent remarks. In addition, changes to the intervention to make the program easier or more fun to implement were provided by parents. One change identified by five parents was to remove a specific type of question from the lesson plan since it was difficult to get their child to complete the question. This change was made to the program for future lessons.

Purpose of the Present Study

This study serves as a continuing effort to fill in the gap of early interventions for parents and children from at-risk populations to assist with preparation for kindergarten. The children and parents who attend Head Start have been identified as an at-risk population by numerous studies, indicating children enrolled in Head Start would benefit from further supports to prepare them for learning in kindergarten. This study provides support for parent active involvement programs by encouraging parents to become engaged in learning activities at home and assisting parents to teach their children essential early literacy skills that are predictive of later learning. This study expands upon the findings of the pilot study by providing information about whether this type of intervention produces effects beyond the original outcomes of the pilot study. To examine outcomes in other reading areas, the study examined any changes in vocabulary development and comprehension. The study also further extended the pilot study by examining early literacy program effectiveness with a larger sample of parents and children and comparing families to a control group. Expanding upon the qualitative findings from the pilot study where parents reported engaging in a greater variety and

frequency of early learning activities, this study examined changes in activity level quantitatively by having parents complete a questionnaire assessing engagement in early learning activities in the home.

Chapter Three: Research Methods

This chapter focuses on the research methods employed in this study. First, roles of research staff, participants and delimitations, settings, and measures are described. Next, the research design is discussed, followed by a description of the procedures. The discussion of procedures includes ethical considerations, training for study staff and parent participants, and data collection. This chapter concludes with a presentation of the data analyses used for the purposes of addressing the research questions. The data analyzed within this study were collected as part of a larger empirical study conducted in the spring and summer of 2011. This larger study sought to examine multiple factors that may impact parental involvement in children's early literacy development and how parental involvement may improve children's early literacy skills.

Roles of Research Staff

The larger study utilized a team of individuals to carry out the data collection procedures. Several terms will be utilized to describe the research team members. The Primary Investigator (PI) served as the faculty supervisor for the overall project. The study coordinator was the author of this dissertation. Responsibilities of the study coordinator included: (1) training research staff on how to administer all outcome measures and the study procedures, (2) organizing the research staff for recruitment and data collection, (3) maintaining contact with parents to answer questions and arrange meetings, (4) observing parents conducting lesson plans, and (5) directly collecting data

within the Head Start centers. Additional research staff was composed of three graduate-level school psychology students and one undergraduate student earning a Bachelor's in psychology. Responsibilities of the research staff included: (1) training parents following a set of procedures outlined by the study coordinator, (2) collecting data from parents via rating scales, and (3) collecting data from children by administering the early literacy measures.

Participants

Participants were recruited as part of the larger study from three Head Start Centers within one urban county in west central Florida. Combined enrollment in all three centers was approximately 290 children. Meetings to describe the study and requirements for participants were held with the social worker from each center to facilitate recruitment. Social workers at each center and research study staff distributed flyers to families who were English speaking. The flyer informed parents that the research study involved implementing one of two interventions at home that may improve their child's early reading skills. A general description of the time requirements for either intervention was provided along with next steps parents should take if they wanted their child screened for the study. Parents who signed and returned the bottom portion of the flyer to the Head Start centers gave permission for the study coordinator or research staff to screen their child. In total, 62 flyers were returned with parents indicating interest in the study. All children whose parents returned the signed portion of the flyer were screened using three early literacy assessments described in detail later in this chapter.

Thirty parent-child dyads were selected based on inclusion criteria out of 62 possible families. All 30 parent-child dyads were fluent in English and the child was enrolled full-time in the Head Start Program. In addition, the child scored below: (a) 10 first sounds on the DIBELS First Sound Fluency assessment, or (b) 10 letters on the DIBELS Letter Naming Fluency assessment, and (c) had no score on either First Sound Fluency or Letter Naming Fluency above 15. A total of 32 children obtained early literacy scores meeting inclusion criteria. Due to the financial restrictions of the research study, only 30 of the 32 families could participate and receive the financial incentive provided for completing the research study. When children had identical scores, the child who scored lower on the four individual sections of the Preschool Early Literacy Indicators (PELI) was selected for the research study. In the final sample of 30 children, the number of children from a single classroom ranged between 1 and 3 children.

The Head Start program within the county offers several options for families to enroll their children. Families in which the caregiver is working full-time or is enrolled in school can apply to have their children in the full-day/full-year program. All families who participated in this study had their children enrolled in the full-day program. The Head Start organization within the county provides services to over 3,000 children ages 0-5 (Head Start, 2008).

Eligibility for the Head Start program is based on a parent/guardian's income level, which must fall below the federal poverty line based on the number of dependents in the family. The relationship between low socioeconomic status and deficits in early development has been well documented both in general populations (Evans, 2004) and in

children enrolled in Head Start (Zill et al., 2003). Therefore, no comparison will be made to a higher socioeconomic status group.

Participant Attrition. Thirty parent-child dyads were initially selected to participate in the study and all agreed verbally to participate in the study. Participants were then matched and randomly assigned to either the intervention or control condition. The parents were scheduled to meet with the study coordinator or research staff to fill out initial measures. Two parents never completed the initial meeting despite several meeting times being set, reducing the sample to 28 parent-child dyads. In addition, during intervention implementation, two more parents declined further participation in the study, one due to moving out of the area and the other due to medical reasons. Therefore, the final sample for analysis is 26 parent-child dyads.

Demographic information for the 26 parents who completed the study can be found in Table 1. Demographic information for the 26 children can be found in Table 2.

Table 1

Parent Demographic Information by Condition

Variable	*Treatment*	*Control*	*Total*
Relationship to Child			
Mother	11	12	23
Father	2	1	3
Race Ethnicity			
Black/African American	8	7	15
Hispanic/Latino	3	3	6
White	2	3	5
Highest Level of Education			
High School Graduate	3	5	8
Some Post-High School Education	8	5	13
College Graduate	2	3	5
Average Number of Children in Home	2	2.3	2.2
Caregivers in Home			
One	9	6	15
Two or more	4	7	11
Average Hours in Work & School per Week	35.5	25.42	30.5

Table 2

Child Demographic Information by Condition

Variable	*Treatment*	*Control*	*Total*
Gender			
Male	3	3	6
Female	10	10	20
Average Age (in months)	56	56	56
Race Ethnicity			
Black/African American	9	6	15
Hispanic/Latino	1	3	4
White	1	1	2
Multi-racial	2	3	5

When compared to the most recent demographic data for Head Start Centers within the county, the study sample was consistent with the percentage of parents who were African American, had approximately 10% fewer Hispanic parents, and approximately 7% more White parents (Finney, 2009). The difference in representation of Hispanic families may be due to the inclusion criteria for this study which required parents to be fluent in English. Regarding education level, the parents within this study were more likely to report having some Post-High School Education (difference of approximately 20%), or to be a college graduate (difference of 12%; Finney, 2009). The report issued by the county Head Start organization did not contain a description of the types of family structure, but a national survey of Head Starts centers collected demographic data in 2009. This national sample reported a consistent frequency of

single-parent or dual parent households, with approximately 54% of families reported as being single parent households (Hulsey et al., 2011).

Settings

The three Head Start Centers are located within 10 square miles of each other. Center 1 had 100 children divided into 5 classes, Center 2 had 70 children divided into 4 classes, and Center 3 had 60 children who were divided into 3 classrooms. Due to the close geographic proximity of these centers, children may change the center they attended to be closer to a parent's work or mode of transportation. During the study, two children changed their enrollment from one center to another. As a result of this movement, children were viewed as one sample within the community and outcomes were not be examined by center in the statistical analyses.

All early literacy assessments took place at a table in a quiet portion of the hallway or in an empty room within the Head Start Center. Meetings with parents for training and for completion of questionnaires were completed at the Head Start Centers, in public meeting spaces, at the family's home, and at local restaurants. Although not ideal, some families indicated discomfort with holding meetings in their homes, requiring the study coordinator or research staff to hold meetings at neutral sites (i.e., local restaurants). When meeting in these alternate locations, all attempts were made to limit distractions. At restaurants, children were placed in the inner seat of the booth with their parent seated toward the outside. Children were reminded of the procedures for completing the activities and if necessary offered a reward for working (i.e., sticker, fruit snack). Before any of the literacy assessments were attempted, children were asked if they could hear the examiner's voice to ensure valid assessments. Assessments of child

skills were completed approximately every 3-4 weeks. Parents filled out questionnaires in the presence of the study coordinator or research staff who could answer questions about the scales and check for completeness of the questionnaires. Meetings with parents were scheduled at a time and place convenient for the parent.

To understand possible growth in literacy in the control condition, it is important to the daily academic content children were instructed in. Children received a similar curriculum in each of the Head Start Centers. The curriculum applied within all Head Start centers within the county is The Creative Curriculum System for Preschool (Dodge et al., 2002) which focuses on promoting overall development for children and is one of the two primary programs employed in Head Start Centers across the nation (U.S. Government Accountability Office, 2004). Within the curriculum, some activities focus on developing early literacy skills such as letter naming and phonological awareness. However a review of practices within a national sample of Head Starts revealed that practices may differ from the structured curriculum. Despite the focus on literacy development within the Creative Curriculum, teacher report revealed that only 67 percent of children received daily or almost daily instruction in letter names, only 48 percent of children received daily or almost daily activities focused on phonics, and only 41 percent of children received daily or almost daily activities involving rhyming words (U.S. Government Accountability Office, 2004). The less frequently observed focus on phonics and phonological awareness within instruction reported in the literature is consistent with anecdotal teacher accounts from the Head Start Centers within this study, where teachers indicated few, if any, activities directly focused on teaching phonological awareness.

Independent Variable

Parent-child dyads were matched and then randomly assigned to either an intervention or control condition. Parents in the intervention group were taught to implement a pre-literacy intervention package focusing on increasing letter-naming abilities and phonological awareness performance in their children. Parent-child dyads in the intervention condition were asked to complete twenty-seven, fifteen-minute sessions (three lessons each week for nine weeks). During these sessions, parents followed a scripted lesson plan that (1) detailed a mnemonic device to teach letter names (Raschke et al., 1999), (2) reviewed three letter and name pairings from the previous lessons, and (3) completed an onset-identification activity when the child either indicated whether the onsets of word match or produced the onset of the word. For reference, a sample lesson plan can be found in Appendix A. After completing the top portions of the lesson plan(s) with basic information about when the session occurred, parents began the session by presenting 26 flash cards that contained one upper and lower case letter per card. These cards were to be presented in random order. On the lesson plan, the parent recorded whether the child correctly named the letter or not. If the child did not correctly name the letter, the correct name was told to the child by the parent (i.e., "This is a B.").

The next portion of the session involved teaching letter names using a mnemonic strategy. Parents were instructed to present one letter and one picture flashcard associated with a spoken sentence. The sentence for each letter contained a cue for the letter name. For example, the letter Ss was paired with a picture of an escalator and the sentence "Escalators are moving stairs". To teach the letter, parents read the italicized directions on each lesson and completed actions corresponding to them (i.e., provide

praise or correction to child). These directions provided cues to identify the letter name within the sentence. In addition to presenting the picture card, letter card, and sentence, parents engaged in a round of practicing the association by repeating it. Through this process, prompts are faded so that the child is independently saying the phrase and letter name with and without the visual cue from the picture card.

After teaching a new letter, the three letters from previous sessions were reviewed. For each review letter, the child was shown the picture and letter cards next to each other and was asked to say the sentence associated with the picture and then say the letter name. Children were praised or assisted in getting the correct answer by the parent.

Each session concluded with the parents engaging in a phonological awareness activity that required the child to identify whether first sounds within a word match or to produce the first sound(s) of a word. The initial lessons focused on identifying whether or not the first sounds of a word match. An example question would be "Do **tree** and **bed** start with the same sound?" Parents were informed to place emphasis on the two bolded words when speaking to make the comparison words stand out. In addition, the parents were also expected to provide correction by drawing attention to first sounds if the child did not get the answer correct. An example correction might be, "/t/ /t/ /t/ /ree/ and /b/ /b/ /b/ /ed/ do not start the same. Listen, /t/ /t/ /t/ /ree/ and /b/ /b/ /b/ /ed/." Beginning in the tenth lesson, a new form of question was introduced in sound practice. Children were asked, "Tell me the first sound in **mop**" and children were coached by their parent to shorten answers to the initial phoneme. The frequency of this type of question increased in sound practice through each lesson until lesson 19 where all phonological awareness questions were asked in this format. For all phonological

awareness questions, parents were prompted by the lesson plan steps to provide praise and/or correction for the child's answers. The final portion of the lesson consisted of the parent completing a Likert rating for how well the session went, providing a short explanation for how the session went, and recording any concerns they had about the program or how their child was doing.

Parents in the control group were given a packet of tips for reading with their child at home. The packet contained (1) a checklist to assess the home literacy environment that parents could complete on their own (Get Ready to Read!, 1999), (2) a list of milestones related to reading that are often achieved in preschool (Reach Out and Read, 2000), (3) general guidance on reading with the child using dialogic reading strategies (Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994), and (4) a brief list of books for preschool children with a short description of the book. See Appendix B for a copy of this packet. This packet was created as a simple alternative that preschools could use to possibly impact how parents read at home with their child. It could be considered an "enhanced treatment-as-usual" since none of the three centers currently provided information similar to this to the enrolled families at the time of this study.

Dependent Variables: Measures

Dynamic Indicator of Basic Early Literacy Skills. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Kaminski, Cummings, Powell-Smith, & Good, 2008) are characterized by being sensitive to small changes in student performance over short periods of time (i.e., dynamic). These brief measures are well suited to frequently monitor progress toward a benchmark or goal. The DIBELS assessments are considered indicators as they measure key behaviors to indicate overall performance in early literacy

skills (Kaminski et al., 2008). The DIBELS Letter Naming Fluency measure used within this study is a downward extension of the kindergarten Letter Naming Fluency assessment. In addition, a relatively new measures used within this study is the DIBELS First Sound Fluency. The predecessor of the DIBELS FSF was the DIBELS Initial Sound Fluency assessment. Since the DIBELS ISF assessment heavily influenced the development of the DIBELS FSF assessment, both measures will be discussed below.

DIBELS Initial Sound Fluency. The Initial Sound Fluency (ISF; Kaminski & Good, 1998) assessment predated the First Sound Fluency assessment, and assesses a child's phonemic awareness skills by examining his or her ability to recognize and produce the initial sound or group of sounds of an orally presented word. The probe is scored by timing the latency of the child's response, or how the time it takes from the end of the question to the child's correct response. The time is then converted to a score of correct initial sounds per minute.

An assessment of the reliability and validity of the DIBELS ISF was conducted using a sample of 86 kindergarten students (Hintze, Ryan, & Stoner, 2003). All assessments were completed within three days for each participant, with participants taking breaks in between assessments. Reliability was assessed via the administration of an alternate form of the ISF. Results showed that ISF had an alternate form reliability of .86 (Hintze et al., 2003). Concurrent validity was examined by comparing performance on the ISF to subtest scores on the Phonological Awareness and Phonological Memory Composites of the Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgesen, & Rashotte, 1999). A moderate correlation of 0.60 was found between ISF scores and the CTOPP Phonological Awareness Composite score and a 0.46 correlation

was found between the CTOPP Phonological Memory Composite score and the ISF score. This study also examined the discriminate validity of DIBELS ISF by comparing ISF scores to the CTOPP Rapid Naming Composite. The low correlation between these two scores (0.20) provides initial evidence that ISF measures a specific skill that does not overlap with other skills. These initial reliability and validity tests were promising, but further research has raised some issues with the measure. Practitioners have indicated that the measure is difficult to administer and although demonstrating adequate reliability, it is one of the least reliable measures when comparing all DIBELS measures (Cummings, Good, Kaminski, & O'Neil, 2008). These reasons prompted the Dynamic Measurement Group to develop a different assessment to gather information on children's ability to identify and produce the initial sound of a word (DIBELS FSF).

DIBELS First Sound Fluency. The DIBELS FSF is designed to measure the same skill as DIBELS ISF, known as phonological onset-rime awareness (Cummings, Good, Kaminski, & O'Neil, 2007). This skill is a precursor to phonemic awareness (Sindelar, Lane, Pullen & Hudson, 2002). The measure was created to overcome some of the problems found with the DIBELS Initial Sound Fluency (ISF) administration and scoring. In an examination of the new measure, Cummings and colleagues (2007) compared DIBELS FSF to the DIBELS ISF, and the Picture Naming, Alliteration, and Rhyming tasks of the Individual Growth and Development Indicators for Early Literacy (EL-IGDIs; Missal et al., 2007). The results showed that DIBELS FSF had the greatest sensitivity to growth during the pre-kindergarten year, predicting an average growth of 0.50 first sounds per minute each week (Cummings et al., 2007).

Technical adequacy of DIBELS FSF. An assessment of 73 prekindergarten children showed adequate test-retest reliability for administration of one probe of the DIBELS FSF with an alternate single probe given one month later having a correlation of 0.86 (Cummings et al., 2007). In the same study, validity for the measure was established by comparing DIBELS FSF scores with the Alliteration and Rhyming subtests of the EL-IGDI. On the end of the year Alliteration task, the end of the year FSF score produced a correlation of r=.62, which was statistically significant at the p=.05 level. On the end of the year Rhyming task, the end of the year FSF score produced a correlation of r=.49, which was statistically significant at the p=.05 level. Predictive validity was also examined. Later DIBELS tasks assessing phonological awareness include Nonsense Word Fluency and Phoneme Segmentation Fluency and DIBELS FSF produced correlations of 0.53 and 0.71, respectively.

Administration and Scoring of DIBELS FSF. DIBELS FSF is meant to be administered during the prekindergarten year through the fall and winter of kindergarten. Children are first trained on how to respond to questions by a scripted teaching sequence. Appendix C contains the directions and a sample probe. Children are asked to identify the first sounds in words presented orally for up to one minute. Children can earn two points per item if they provide only the first phoneme in a word, and receive one point for responding with the first two or three phonemes of a word. The child does not receive any credit for repeating the word, providing more than three phonemes, or answering with related word.

DIBELS Letter Naming Fluency. The DIBELS Letter Naming Fluency has been recently extended for use with children during the prekindergarten year. A previous

version of this adaptation was termed Letter Knowledge and was used in the pilot study of this intervention program. More recent adaptations have called the measure Letter Naming Fluency but included several adaptations for younger children. The DIBELS Letter Naming Fluency provides a measure of risk for problems in future literacy development. Hintze and colleagues (2003) also examined the reliability and validity of DIBELS LNF by using alternate forms and comparing results to the CTOPP. Alternate form reliability of administration of a single probe was very good (0.94). In addition, concurrent validity was established by examining the correlations between administration of a single probe of DIBELS LNF and the CTOPP composites of Rapid Naming, Phonological Awareness, and Phonological Memory.

Administration and Scoring of DIBELS LNF. DIBELS LNF is meant to be administered during the preschool and kindergarten years. The probe provided to preschool children has 52 letters (upper- and lower-case) placed in random order and the size of the text is larger. The kindergarten probe has more letters, with some repeating and a small text size. Appendix D contains directions and a sample record sheet for DIBELS LNF. Children are asked to point to and name each letter going across the rows from left to right, moving from the top to the bottom of the page. Children are given one minute to point to and name as many letters as they can, and correct responses within one minute are totaled to generate a score (Good et al., 2004).

Preschool Early Literacy Indicators. The Preschool Early Literacy Indicators (PELI) was developed by the Dynamic Measurement Group as a screening and progress monitoring tool to assess foundational pre-reading skills in preschool children (Kaminski & Aguayo, 2010). Four key skills are assessed: (a) alphabet knowledge, (b) phonemic

awareness, (c) vocabulary and oral language, and (d) comprehension. The items are presented in a storybook format with the questions being embedded within a picture book that the examiner and the child read through and the child answers questions. At the time of this study, a total of three different PELI story books were available. This assessment tool was included in the study to capture changes in a larger number of early literacy skills. In addition, because this measure is untimed, children who have a longer latency of response are not penalized for not answering rapidly. For example, a child may only receive a few points on the DIBELS LNF measure because he or she may take a long amount of time to name each letter accurately. With the PELI Alphabetic Knowledge subtest, the child may take as long as needed to name letters, which can far exceed the DIBEL LNF one-minute time limit.

Technical Adequacy of the PELI. Although the PELI has been developed recently, the authors have shared initial data from the pilot study examining reliability and validity (Kaminski, 2012). The PELI was administered to 131 preschool children, ages three through five years old, at three different points in one school year. For alphabet knowledge, the average score began at 10 letters named correctly, increased to 17.45 letters in the middle of the year, and ended at 20.22 letters named correctly at the end of the year. For phonemic awareness, the average score began at 6.86 points, increased to 7.50 points in the middle of the year, and the end of year average score was 8.11 points. In the comprehension area, the average score for children at the beginning of the year was 8.89 points, increased to 10.24 points at the mid-year assessment, and then decreased slightly to 9.14 points. Finally, the vocabulary and oral language subscale had an average level of 17.04 points at the beginning of the year, increasing to 19.13 points in

the middle of the year, and then decreasing slightly to 18.74 points by the end of the school year.

As part of this pilot study, a subset of children completed the Clinical Evaluation of Language Fundamentals Preschool- Second Edition (CELF Preschool-2; Semel, Wiig, & Secord, 2004), the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, Torgesen, & Rashotte, 2007), and the Peabody Picture Vocabulary Test- Fourth Edition (PPVT-4; Dunn & Dunn, 2007) at the beginning and end of the school year. The CELF Preschool-2 assesses language skills by compiling three subtests to generate a core language score. The three subtests include Sentence Structure, Word Structure, and Expressive Vocabulary. Two subtests of the TOPEL were administered: Print Knowledge and Phonological Awareness. The PPVT-4 assesses word retrieval and expressive vocabulary and yields a total score for vocabulary acquisition.

Correlations were calculated between each of the subtests of the CELF Preschool-2, TOPEL, and PPVT-4 tests and the four subtests within the PELI for tests the three test administrations. Only children who possessed both administrations on each test were included. Therefore, sample sizes for each correlation vary, but were between 30 and 45 children. Regarding the CELF Preschool-2, correlations were statistically significant and highest with the PELI Vocabulary and Oral Language Scores (r= 0.52-0.71) and the Comprehension subtests (r= 0.30-0.69), and lower with the Phonemic Awareness (r= 0.26- 0.44) and Alphabetic Knowledge (r= 0.15- 0.49). Correlations with the TOPEL Print Knowledge subtest were strongest with the PELI Alphabetic Knowledge and all relationships were statistically significant (r= 0.56-0.92) at the $p<$ .001. All other PELI subtests were not significantly correlated or had relationships less

than r= 0.15. The TOPEL Phonological Awareness had stronger correlations with the Phonemic Awareness scores of the PELI when the end of year scores for both measures are compared (r= 0.56). Weaker relationships were found between the PELI's Alphabetic Knowledge (r= 0.41-0.55) and Vocabulary and Oral Language (r= 0.38-0.46) subtests. Scores on the PPVT-4 and the PELI's Comprehension and Vocabulary and Oral Language subtest scores correlated more strongly than the Alphabetic Knowledge and Phonemic Awareness subtests. All comparisons of the scores including the PELI Comprehension scores were statistically significant and showed a strong positive relationship (r= 0.56-0.82). Comparisons including the Vocabulary and Oral Language scores were also all statistically significant and positive (r= 0.52-0.85). Based on the strong correlations found between PELI subtest scores and the respective assessments that these subtests would be expected to correlate with, this assessment tool has data to support the validity of the PELI in each subtest area.

Administration and Scoring of the PELI. The PELI is administered in a story book format with the examiner sitting to the right of the child and reading content and questions from the book. Child answers are recorded on a separate single-page sheet. A copy of the record sheet can be found in Appendix E. The PELI begins by showing the child the front cover of the book and asking an initial comprehension question (i.e., "What do you think this book will be about?") and then scoring the child's response on a 0-2 scale. Two points are awarded for an answer that can clearly be drawn from the front cover, such as saying "A farm" when a barn and fields are on the front cover. If the child's answer is related, but could not be drawn directly from the cover, it can receive one point. In the example where a barn and fields are on the front cover, if the child

names a farm animal (i.e., cow, pig, rooster) this would receive a single point. Zero points are awarded for no response or if the response is not related in any way to the image on the front cover.

The book is then opened and laid flat with the examiner reading the scripted directions from the right page and directing the child to look at the images on the left page. The first two pages inside the book assess Alphabetic Knowledge. The first page contains capital letters in a random order. The child is asked, "Do you know any of these letters? Point to and tell me the names of all the letters that you know." The child can go in any order on the page and the examiner records correctly named letters with a circle and places a slash through letters not named correctly. Children are allowed to self-correct on letters and the final letter name stated is the one scored. Children continue naming letters until all have been named or if the child misses three letter names in a row. If a child stops naming letters before all on the page have been identified, the examiner is to point to letters the child has skipped and ask the child to name them. After completing this page, the examiner totals the number of correct letters. If the child has correctly named 16 or more uppercase letters, the process is repeated with the lowercase letters. If the child has 15 or fewer uppercase letters, the lowercase letter page is skipped and the next set of activities begins. At the end of these two pages, the total number of letters named correctly is added.

The next section represents the first set of Phonemic Awareness questions. Children are taken through a teaching sequence where they are taught how to identify the first "little bit" of a word. After this, the child is provided with five words verbally to identify the first sounds. Oral responses are scored on a 0-2 scale with two points being

awarded for saying the initial phoneme only (i.e., /k/), one point for saying the first two or three phonemes (i.e., /ki/, /kich/), and no points for longer responses. The examiner records the oral response by circling the option that best represents what the child stated. Points earned on these five items are totaled and then recorded half way through the Phonemic Awareness box.

The next page presents ten images of nouns associated with the topic of the story and represents the initial questions for the Vocabulary and Oral Language section. Children are asked to name all of the pictures they know. If the child correctly names a picture, the word is circled on the record form. If a related word is provided by the child, the word is written on the record form and the printed word is underlined. These responses receive no points. If a child skips a picture, the examiner will ask the child to name that picture. After labeling all the pictures, the examiner picks three pictures the child was able to identify correctly and asks the child, "Tell me everything you can about _____." If the child could not correctly name three pictures, each book provides the three specific examples to ask the child about. Children's responses are scored on a 0-4 scale. A child can receive four points if they supply two correct details about the item they are asked to describe. For example, if a child describes a spoon as "something you eat with and it is shiny", this would receive four points. Children who provide one correct detail receive three points for their response. If a child does not respond to the first prompt of an item, the child is prompted, "What do you do with a _____?" If this response is correct, the child receives two points. If the child responds incorrectly, they are asked a scripted question about the item where the answer choices are

dichotomous (i.e., “Do you eat tacos or soup with a spoon?”). Correct answers to the dichotomous question receive one point and incorrect answers receive no points.

The next several pages in the PELI book present a story. Throughout the story, there are both Phonemic Awareness questions and Comprehension questions. The examiner reads the story and at specific times asks the child to identify which orally-presented word begins with a specific sound. To facilitate this, three pictures paired with words are provided for the child to choose from. Each time the child identifies the correct word for the question, they receive one point. Comprehension questions from the story are scored on a 0-2 scale with correct answers receiving two points, related answers receiving one point, and incorrect answers or no response receiving no points.

After reading the entire story, the PELI book opens to a blank page and the child is asked five specific Comprehension questions. The scoring for these items is a 0-2 scale that is the same as before. The next page contains seven small images detailing the entire story that has been read by the examiner. The child is asked to retell the story using the pictures. As the child is narrating, the examiner listens for the specific phrases listed on the page. For every detail the child states, they receive one point and scores on this question can range from 0-10. The number of details reflects the child’s Vocabulary and Oral Language abilities.

After finishing the assessment with the child, the subtotals within each of the four areas are summed and recorded in the spaces at the bottom of each box. In addition, the examiner rates two aspects of their interaction with the child. The child’s articulation is rated on a 0-3 scale with zero representing unintelligible speech and three representing good articulation. The quality of the child’s verbal response to questions is also rated,

but on a 0- 4 scale. Children who provide no verbal responses receive zero points, primarily single word responses receive one point, brief phrases receive two points, complete sentences with some errors receives two points, and grammatically correct sentences receive all four points (Kaminski & Aguayo, 2010).

Home Activities Questionnaire. An additional aim of this study was to examine whether the intervention condition resulted in parents changing their engagement in early learning activities at home. Therefore, a measure was adapted to capture parents' engagement in early learning activities beyond those completed as part of the intervention or control group activities. To assess changes in the type, frequency, and quantity of activities parents engage with their child to assist learning, a survey questionnaire was adapted from previous research. Sénéchal and colleagues (1998) developed a survey for parents to complete focusing on home activities that are likely related to later reading outcomes. The questions were based on previous research in early literacy and included items assessing: (a) frequency of shared reading at bedtime and other times of the day, (b) frequency of requests to read made by the child, (c) frequency of library visits with the child, (d) an estimate of the number of books within the home, and (e) the approximate age the parent began reading to their child (Chaney, 1992; DeBaryshe, 1993; Dickinson & Snow, 1987; Dickinson & Tabors, 1991; Mason & Stewart, 1990). In previous research, the items within the questionnaire have yielded significant correlations to numerous early literacy domains such as vocabulary performance, listening comprehension, print concepts, phonological awareness, understanding of syntax, and decoding skills (Sénéchal, LeFevre, Hudson, & Lawson, 1996; Sénéchal, LeFevre,

Thomas, & Daley, 1998; Sénéchal, Pagan, & Lever, 2008; Sénéchal, Thomas, & Monker, 1995).

To develop the new questionnaire used for this study, the questions focusing on frequency of shared reading, frequency of requests to read, frequency of library visits, and estimation of books within the home were retained. These items had consistent positive correlations with early literacy constructs throughout studies. Additional questions were added to gather further information about *all* early learning activities that parents may engage in within the home. Activities that were added include those listed by parents in the pilot study, such as practice printing the child's name, learning numbers and counting, and labeling objects in the environment. For all of the additional questions, parents responded indicating the frequency that they had completed each of these activities within the past week. Two final questions were added focusing on the amount of time parents engaged in all educational activities with their child. Parents reported an estimate of how many minutes they engaged in any educational activities and for how many minutes other adults engaged in educational activities with the child. These questions were added to record changes in the amount of time the child received educational enrichment at home. A copy of this questionnaire is presented in Appendix F.

Intervention Integrity. Documentation of intervention integrity, or how much of and how accurately the intervention was completed, was also included in the data collection. Two measures of intervention integrity were applied within this study. The primary method of assessment was an examination of lesson plan completeness (i.e., fully-filled out sheets) with a secondary assessment method of observing one parent-led

session and recording how closely parents followed training procedures on a checklist. To assist in understanding these two methods, a sample lesson plan has been placed in Appendix A. Each of the four sessions of the lesson (letter check, new letter, letter review, and sound practice) has steps which need to be completed by having parents check off, fill out, or circle yes of no. Some lessons have fewer steps then others due to slight variations in the set up. For example, the first session has no steps within the letter review section because no letter/sentence mnemonics have been taught. The number of steps for each lesson varies from 58 to 64 steps. To compensate for this difference, completed steps were converted to a percentage of the total lesson completed using the following formula:

$$\frac{\text{Number of Completed Steps}}{\text{Number of Total Steps Possible}} \times 100$$

In addition, each parent in the intervention group was observed completing a lesson by the study coordinator or one of the research staff. The checklist used to assess parent's adherence to the intervention procedures can be found in Appendix G. Meetings were held within the home (n=8) or in a quiet area of the child's Head Start center (n=5). The number of steps that were completed (indicated by the observer circling "Yes") were divided by the total number of steps within the checklist and multiplied by 100 to convert this assessment to a percentage.

Intervention Acceptability. Intervention acceptability refers to perceptions and feelings regarding the intervention from the people who are implementing it (Witt & Elliott, 1985). In the case of this study, intervention acceptability refers to the parents' feelings toward the early literacy intervention that was assigned to their group. One measure that has been used to quantify this construct is the Intervention Rating Profile

(IRP-15; Witt & Martens, 1983). This measure was originally composed of 15 questions that participants indicate their responses using a Likert scale format from 1 (Strongly disagree) to 6 (Strongly agree). The form was originally created for teachers to complete to rate the acceptability of classroom interventions.

An altered form of the IRP-15 was used within the pilot study (Sundman, 2009) and was used again in this continuation study. When converting the questionnaire to be completed by parents, two questions could not easily be altered to be appropriate for the interventions within the study and these questions were removed. The original items that could not be easily adapted for the new raters (parents) were: (1) "I would be willing to use this intervention in the classroom setting", and (2) "This intervention is consistent with those I have used in classroom settings." In total, the measure used within this study contained 13 items. The fully adapted form can be found in Appendix H.

Design

The larger study from which data were extracted employed a two-group, true experimental design with random assignment to conditions. The experimental condition consisted of an in-home intervention to improve phonological awareness and letter naming skills. The control condition was an enhanced "treatment as usual" with parents receiving information about engaging in shared reading at home. Due to the smaller sample size, child participants were matched on initial variables (i.e., child gender, early literacy scores) and then one child from the matched pair was randomly assigned to a condition (Glass & Hopkins, 1996). Socioeconomic status was similar across participants since all families were enrolled in Head Start. Parent and child data were collected over five different time points: (1) an initial assessment, (2) three assessments

during the nine-week intervention, and (3) a follow-up assessment three weeks after the intervention. These assessment points allow for examination of growth over time in each condition as well as maintenance of gains after the intervention was completed. All participants received training and materials for their assigned condition at the same time.

Procedure

Ethical Considerations. The larger research study, from which the archival data for this study were extracted, was approved by the University of South Florida Division of Research Integrity and Compliance Institutional Review Board (IRB). A copy of the informed consent parents completed can be found in Appendix I. In addition, consent for participation was sought from and granted by the county's Head Start Division of Children's Services. The study was initiated upon receipt of approval from both agencies. The study coordinator and research staff made every effort to ensure that participants were treated ethically and that confidentiality was maintained. Informed consent was obtained from the parent participants. Assent was not sought from the children since it is not a requirement when children are under 5 years of age. For data entry purposes, parent-child dyads were identified by code numbers. Data were stored in a locked file cabinet in a University of South Florida faculty office and the data entry sheets were password protected to enhance security of the data.

Training in DIBELS and PELI Administration. The study coordinator and three of the research staff administering assessments to children had previously received training in administration of DIBELS probes during their graduate studies. In addition, the graduate students have also received training in the administration of standardized tests. The research staff member who was completing undergraduate coursework was

given individualized training on the importance of adhering to testing protocols and clarification on assessment procedures with young children by the study coordinator. The study coordinator received training in both DIBELS assessments and the PELI by a representative of the Dynamic Measurement Group who is knowledgeable of all measures. The research staff were trained by the study coordinator on all three assessment measures in three meetings which lasted approximately 45 minutes each. For the PELI, research staff watched videos of PELI administration released by the Dynamic Measurement Group and completed 1-2 practice administrations with the study coordinator providing feedback. Research staff had to demonstrate at least 95% accuracy in administration on all measures before being approved to collect data for the study.

Training for Meeting with Parents. Interactions with parents were designed to follow a specific pattern outlined within a Handbook for Parent Trainings developed by the study coordinator (see Appendix J). The Handbook provided guidance on how to explain the study, obtain informed consent, instruct parents on filling out the questionnaires, provide answers to questions that parents may have regarding the study or measures they were asked to complete, and how to proceed with training parents to implement the intervention or control condition. These procedures were developed by the study coordinator and reviewed with the research staff prior to being used in meetings with families. In addition, the three graduate level research staff had received training on how to administer rating scales and questionnaires to adults. The undergraduate research staff member was paired with either the study coordinator or graduate-level research staff for all meetings with parents.

Participant Selection. After receiving approval from the county administration of Head Start, social workers at the three Head Start centers were contacted and given information about the study and a handout including the study coordinator's contact information. In addition, a meeting was scheduled for the study coordinator to speak for 10 minutes at a parent night at Center 2. Centers 1 & 3 could not find time to allow for a presentation at parent night. Social workers and research staff distributed handouts to parents within the Head Start center whose children were enrolled and at least one parent was fluent in English. A total of 30 children and their parents were included in the initial sample. Children were then paired based on gender and then on their scores on all three early literacy assessments. After pairing, one member of the pair was randomly assigned to a condition. After being assigned to a condition, parents were contacted to inform them that they qualified to be in the research study and meetings were set up to go over the informed consent, train the parents, and deliver materials for the intervention or control group. An example of the informed consent for the parents is in Appendix I.

Parent Training. Parents in both the intervention and control conditions received training related to the materials they were given to complete with their child. Both the intervention and control group trainings were scripted to ensure equivalent content across each caregiver despite having different project assistants or the study coordinator providing the training. The following paragraphs describe the training procedures for the early literacy intervention and the training procedures for the control group.

Training for the intervention condition consisted of two research staff (and/or the study coordinator) meeting with one to two parents to provide instructions, model interactions between the two research staff, and then have each parent practice

implementing a session with either one member of the research staff or the study coordinator. After completing the practice session, parents received specific feedback from the study coordinator or research staff on what corrections needed to be made to implement the intervention correctly. These methods have been shown to be related to increases in intervention integrity (Sterling-Turner, Watson, Wildmon, Watkins, & Little, 2001). More specifically, the training focused on providing corrective and specific feedback, correctly filling out and returning the lesson plans, and completing the phonological awareness activities focusing on matching and identifying the onset of words. Throughout the training, parents were encouraged to ask questions about procedures for using the intervention at home. In total, the completion of the questionnaires and training session lasted from 75-90 minutes for parents in the early literacy skills intervention. In addition to this training, parents in the intervention condition also received weekly phone calls as reminders to complete lessons, answer questions about using the intervention, and to inform them of necessary meetings for the research study. Parents were also instructed on procedures to return surveys and completed lesson plans according to the procedures of the center.

Parents in the control condition met in groups of one to two parents and one research staff member or the study coordinator. Training consisted of reviewing each of the different items within the resource packet. Parents were explained (1) how to complete the checklist and interpret the results, (2) what the common milestones mean and how to develop these skills within their child, (3) the four step process to using dialogic reading strategies within shared reading experiences with multiple examples, and (4) a brief description of the book lists and how to use them. Any questions parents

asked were answered by the research staff or study coordinator. Parents were also encouraged to contact the study coordinator at any time with questions about how to use the strategies within the packet.

Data Collection. Children were assessed at five points over the course of the study with all three early literacy measures. The PELI assessment had only three books available at the time of this study. Therefore, during assessments at Times 4 and 5, the first and second stories, respectively were repeated. Approximately 9-10 weeks elapsed between the first time the PELI assessment was given and when it was repeated. The first screening measure to determine if children met inclusion criteria represents Time 1. At approximately the same time the parents were trained (three to four weeks after the screening), the second child assessment (Time 2) was conducted. Times 3, 4, and 5 occurred in three week intervals after Time 2. Parent survey data were collected during the parent training meeting which was around Time 2. A meeting was held with each parent individually between Times 3 and 4 to complete the observation of intervention procedures. In addition, all parents completed an additional Home Activities Questionnaire between assessment Times 3 and 4 which was sent home or completed at the observation meeting. Finally, all parents filled out the final set of surveys during Time 5. Table 3 details the data collected at each time point within the study.

Table 3

Measures Administered at Each Time Point

	Time 1 *Screening*	Time 2 *Initiation of Intervention*	Time 3 *Middle of Intervention*	Time 4 *End of Intervention*	Time 5 *Short-Term Follow-Up*
Child Measures	FSF LNF PELI (*n*= 26)	FSF LNF PELI (*n*= 26)	FSF LNF PELI (*n*= 25)	FSF LNF PELI (*n*= 24)	FSF LNF PELI (*n*= 25)
Parent Measures		Home Activities Questionnaire (*n*= 24)	Home Activities Questionnaire (*n*= 24) Observation of Intervention (*n*=13)		Home Activities Questionnaire (*n*= 26) Intervention Rating Profile-13 (*n*=26)

Data Analysis

Analysis of the child outcome data took into account the relationship of each child's outcomes over the multiple assessment points. Therefore, data focusing on child outcome differences based upon group was examined using a multilevel modeling approach, with observations of skills nested within individuals. To better analyze each early literacy skill, data from the three DIBELS outcome measures were re-grouped to emphasize the four skills children were assessed on: phonological awareness, letter naming, comprehension, and vocabulary/ oral language. The comprehension and vocabulary/ oral language summative scores were analyzed without any adjustments from the subtests within the PELI. To determine the relationship between the DIBELS FSF and PELI Phonemic Awareness tasks and the DIBELS LNF and PELI Alphabetic Knowledge, correlational analyses were performed, both of which yielded significant correlations. Therefore, a composite variable was created by transforming all outcomes into Z-scores and averaging these scores for each time point. The following model was applied to each of the four early literacy outcomes:

Level One

$$\text{Early Literacy Outcome } (\gamma_{ii}) = \pi_{0j} + \pi_{1j}\,(\text{Time}) + e_{ti}$$

Level Two

$$\pi_{0j} = \beta_{00} + \beta_{01}\,(\text{Intervention}) + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11}\,(\text{Intervention}) + r_{1j}$$

where children's early literacy skill performance at each assessment was predicted as linear growth based on an intercept (π_{0j}), with a varying rate of growth, or slope, (π_{1j}), and a residual for each child (e_{ti}). The factors at Level Two reflect individual factors

related to the preschool child. The model estimated within this study calculates the effect of the treatment condition (intervention or control condition) as a predictor of the slope (or Time) within the Level One equation. Within the Level Two equations, β_{00} and β_{10} represent the intercepts and β_{01} represents the direct effect of the intervention, and β_{11} is the slope predicting π_{1j}. Organization of the data into these levels allows for the effects of the Level One and Level Two variables to reflect the nesting within this data.

The early learning activities engaged in by parents were examined descriptively by calculating means by group. Two variables were calculated to examine differences in the frequency and types of activities over time. To examine the frequency of activities engaged in within one week, a sum was calculated of all activities parents reported engaging in across the week. For example, if a parent reported practicing numbers three times and practicing writing the child's name four times, the sum would be seven. To examine changes in the variety of activities parents engage in, each item a parent endorses was counted as one activity and these were summed for each time point the measure was administered. For example, if a parent reported practicing numbers three times and practicing writing the child's name four times, the number of activities would be counted as two. To examine whether statistically significant changes occurred between the two groups on the activity variables, multilevel modeling was applied with the three assessment points nested within families. The following model was applied separately to both the frequency of activities and the variety of activities:

Level One

$$\text{Activity Level } (\gamma_{ii}) = \pi_{0j} + \pi_{1j}\,(\text{Time}) + e_{ti}$$

Level Two

$$\pi_{0j} = \beta_{00} + \beta_{01}\,(\text{Intervention}) + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11}\,(\text{Intervention}) + r_{1j}$$

where either the frequency or variety of activities at each of the three assessments was predicted as linear growth based on an intercept (π_{0j}), with a varying rate of growth over time (π_{1j}), and a residual for each parent (e_{ti}). The factors at Level Two reflect individual parent factors. The model estimated within this study calculates the effect of either the intervention or control condition as a predictor of the rate of growth within the Level One equation. Within the Level Two equations, β_{00} and β_{10} represent the intercepts and β_{01} is the effect of the intervention on the intercept, and β_{11} is the slope predicting π_{1j}.

The intervention acceptability was analyzed by calculating the total of all items for each participant, yielding a score ranging from 13 to 78. These scores were averaged within each group and the group means were compared using a t-test to examine significance.

Intervention integrity was examined for the intervention group. Self-reported intervention integrity was calculated by summing the percentage completed for each individual lesson and dividing this number by the total number of lessons (i.e., 27) to yield the overall percentage complete of the intervention package. In addition, to estimate the accuracy of the self-reported intervention integrity, the Pearson-Product Moment Correlation was calculated between the percentage completed on the observed self-reported lesson plan and on the percentage completed based on the observation

checklist. This yields an indicator of how accurate the lesson plan completion is for adhering to the intervention protocol for implementing the intervention.

To examine the relationship between intervention integrity and child performance, multilevel modeling was applied to the child's early literacy skill scores through the fourth assessment point, which corresponds to the end of the intervention phase. Intervention integrity was coded as the overall percentage completed by each assessment date (i.e., 0% at initial, percentage of overall total of lessons completed by the second and third assessment, the total completed percentage at time point 4). The model used to calculate the results is as follows:

Level One

$$\text{Early Literacy Outcome } (\gamma_{ii}) = \pi_{0j} + \pi_{1j}\,(\text{Time}) + e_{ti}$$

Level Two

$$\pi_{0j} = \beta_{00} + \beta_{01}\,(\text{Integrity}) + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11}\,(\text{Integrity}) + r_{1j}$$

where the child's early literacy skill in each of the four skill areas was predicted as linear growth based on an intercept (π_{0j}), with a varying rate of growth over time (π_{1j}), and a residual for each child (e_{ti}). The factors at Level Two reflect individual child factors. The model estimated within this study calculates the effect of integrity of intervention procedures as a predictor of the rate of growth within the Level One equation. Within the Level Two equations, β_{00} and β_{10} represent the intercepts, β_{01} is the effect of the integrity on the level of child performance, and β_{11} is the slope predicting π_{1j}.

Chapter Four: Results

The primary purpose of this study was to examine the changes in early literacy skills for children who received a parent-directed early literacy skills intervention program at home. A comparison condition in which parents were given instructions on using dialogic reading strategies with their children was employed. This chapter begins with a discussion of preliminary analyses conducted on the child outcome data. This is followed by the results of multilevel modeling for (1) child outcomes, (2) changes in parent activities in the home over time, and (3) intervention integrity, and analyses of data gathered on intervention acceptability for both the early literacy skills program and the control condition. The results of this study will be presented by first discussing the outcomes in intervention integrity. The intervention integrity data and analyses guided decision-making for inclusion of participants in the analyses examining the effectiveness of the early literacy skills program. The child outcomes by intervention and control group will be discussed next. This chapter concludes with the presentation of results regarding the frequency and variety of activities participants engaged in at home and parent perceptions of intervention acceptability.

Preliminary Analyses

Prior to conducting the multilevel modeling analyses, preliminary data analyses were conducted. Initially, the database was screened for accurate entry by examining full parent and child data entry for every tenth participant (n=3) for all data entered. During

this process, two errors were found and corrected. The data accuracy check then proceeded by examining the row of data before and after the participant with errors and the data entry was found to be accurate for both these participants. Overall, the data entry was found to be 99.93% accurate. As an additional assessment of data accuracy, all parent and child data were examined for values that fell outside the scale for that value. No outlying values were found.

A second form of preliminary analysis focused on the relationships between child outcome measures assessing letter naming and phonological awareness. The data on letter naming and phonological awareness from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and Preschool Early Literacy Indicators (PELI) were analyzed via correlations. The relationship between the DIBELS Letter Naming Fluency (LNF) and PELI Alphabetic Knowledge (AK) subscale scores was based on the Pearson Product Moment Correlation Coefficient and appears in Table 4. The correlation between DIBELS First Sound Fluency (FSF) and PELI Phonemic Awareness (PA) subscale was analyzed with identical methods and also appears in Table 4.

Table 4

Correlations Between Letter Naming and Phonological Awareness Measures

	Correlation Coefficient	*p-value*
DIBELS LNF and PELI AK	0.78**	<0.001
DIBELS FSF and PELI PA	0.80**	<0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

Both analyses revealed strong positive correlations that were statistically significant. The strong positive correlation indicates that higher scores on the DIBELS

assessments often occur with higher scores on the PELI subscale associated with the measure. Due to these significant correlations, the decision was made to combine the DIBELS LNF and PELI AK scores into a composite Letter Naming ability score. The DIBELS FSF and PELI PA scores were also combined to create a composite Phonological Awareness score. The process for creating the composite variable began by transforming each of the four subscales into its' own Z-score for every participant at each of the five time points. Then, the pair of scores for each participant at each time point was averaged to create their composite score for that assessment period. The Z-scores were then applied to answer each of the research questions assessing children's letter naming and phonological awareness outcomes within the multilevel models.

Intervention Integrity Results

The intervention integrity of the early literacy program was assessed through two methods. The primary method of evaluating intervention integrity consisted of examining the percentage of complete steps in each lesson plan for each parent-child dyad and then summing these into an overall total to describe the percentage of intervention activities each child received. A supplementary method for evaluating integrity was a direct observation of parents conducting a lesson with their child. The results of the lesson plan data are described next followed by a summary of the data collected through observation. This section will conclude with a description of the relationship between the intervention integrity measures and the relationship between intervention integrity and child outcomes.

An example lesson plan is located in Appendix A. All parents within the intervention group completed a lesson plan for each session they met with their child.

Each lesson plan had blanks that required parents to record: (1) session logistics (i.e., date, time, started, time finished); (2) completion of lesson activities (i.e., letter check, teaching a new letter, reviewing, and sound practice); and (3) a Likert scale rating of the session, along with blanks to write down any concerns or problems.

Analysis of the lesson plans indicated that all parents did not implement the intervention with the same level of integrity. Data summarizing the intervention integrity for the whole group is presented in Table 5. The average percentage completed was 84.73% of the entire early literacy program. The range for lessons in which parents completed at least one item was between 5 and 27 lessons, with an overall average of 23.92 lesson plans started or completed. It is notable that 10 parents completed 25 or more of the 27 lesson plans.

Table 5

Lesson Plan Completion Data

Variable	*Mean*	*Range*	*SD*
Total Percentage Complete	84.73%	15.64% - 99.34%	25.76
Number of Lessons with at least 1 Item Completed	23.92	5 - 27	6.75
Percentage Complete on Individual Lesson Plans	n/a	4.55% - 100%	10.82

Note: $n = 13$

The three parents who did not initiate at least 25 of the lesson plans completed between 5 and 16 lessons, resulting in a significantly lower level of the total intervention completed (15.64% - 56.31%). This indicates that there were fewer intervention activities

being delivered within these homes. Overall, with the wide range of the total intervention completed, examining the relationship between intervention integrity and child outcome assessments may reveal valuable information to assist in explaining child outcomes.

The direct observation of one lesson completed by a parent provided a second method to analyze intervention integrity. Parents were observed after having the intervention for at least four weeks to allow them to have ample time to practice completing lessons and ask any questions regarding procedures via phone call, email, or through the blanks areas at the end of the lesson plans. The parents were observed on the next lesson they were to complete with their child as part of the early literacy intervention. The range of lesson plans that were observed varied greatly with one parent being observed completing lesson 13 and two parents observed completing lesson 25. However, most parents were observed completing lessons 16-20 (n=8). To accurately record the steps completed by each parent as he or she carried out a lesson, an Observation Checklist detailing each step of the intervention was utilized. A sample Observation Checklist appears in Appendix G. Parents were observed completing whichever lesson plan was next with their child when the meeting was held. Therefore, the number of necessary steps varied slightly between each observation. To account for this difference, integrity was calculated by dividing the total steps correctly completed by the parent by the total steps possible within the lesson to yield a percentage of correctly followed procedures. Due to parent preference, some meetings (n=5) were completed within the child's Head Start center instead of within the home. All other meetings were completed within the child's home (n=8). Table 6 reports the mean, range, and standard deviation of percentage of correctly completed steps for the observations completed

within the home, at the Head Start Center, and for the total sample of the intervention group.

Table 6

Percentage of Correct Steps Completed during Direct Observation

Variable	*Completed at Home*	*Completed at Head Start*	*Total Sample*
Mean	86.97%	80.35%	84.21%
Range	36.84% - 98.25%	56.14% - 98.25%	36.84% - 98.25%
Standard Deviation	22.21	21.39	21.15

Note: $n = 13$

The location of the observation appeared to no observable effect on intervention integrity. On average, parents completed a large portion of the intervention correctly with all groups evidencing over 80% correct procedural steps on average. It is notable that three parents had significantly lower degrees of integrity according to the observation checklist (range of 36.84% - 57.89%), with the 10 other parents performing over 90% of intervention procedures correctly. The parents with lower ratings of integrity on the direct observation often performed procedures incorrectly (i.e., not using all alphabet cards or reviewing them in alphabetical order), skipped portions of the lesson plan, or did not provide praise at indicated points.

To examine the consistency between the two intervention integrity methods (lesson plan completion and direct observation), a Pearson Product Moment analysis was employed. The overall percentage complete of the intervention program (sum of 27 lessons) was compared to the percentage of correct steps as assessed by the Observation

Checklist. Data from the correlation are presented in Table 7. A statistically significant strong and positive relationship was found between the two methods of assessing the integrity of the intervention. Therefore, parents who performed more steps correctly during the direct observation of the intervention were more likely to also complete more of the lesson plans correctly. This very strong correlation is an indication that both assessment measures were likely assessing a similar behavior- adherence to the lesson procedures.

Table 7

Correlation between Intervention Integrity Assessment Methods

	Correlation	*p*- value
Correlation between Lesson Plans and Direct Observation	0.94**	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

Multilevel Modeling of Intervention Integrity and Child Outcome

Assessments. Previous research has established that adherence to intervention procedures can be related to the outcomes observed from an intervention (Roach & Elliott, 2008). In order to assess the potential effect of intervention integrity on child early literacy skill development, multilevel modeling was employed to account for the multiple data points obtained for each child.

To assess the influence of intervention integrity on child outcomes, the following model was applied for each of the four early literacy outcome measures:

Level One

$$\text{Early Literacy Outcome } (\gamma_{ii}) = \pi_{0j} + \pi_{1j}\,(\text{Time}) + e_{ti}$$

Level Two

$$\pi_{0j} = \beta_{00} + \beta_{01}(\text{Integrity}) + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11}\,(\text{Integrity}) + r_{1j}$$

where the child's early literacy skill performance at each assessment is modeled at Level One and is expected to increase over time in a linear fashion. The parameters to be estimated at Level 1 include π_{0j}which represents an individual's intercept at the end of the intervention and is allowed to vary across children, and π_{1j}, which represents a child's individual growth rate, or slope, at the end of the intervention and the slope is allowed to vary across children. The Level Two equation predicts that the level of intervention integrity will be related to a child's growth over time, or slope, and is added as a predictor within the Level Two coefficient for slope. Within Level Two, the fixed effects to be estimated include β_{00} representing the average intercept at the end of the intervention, β_{01} which represents the direct effect of integrity on the intercept, β_{10} representing the average rate of growth at the end of the intervention, and β_{11}representing the interaction between integrity and the rate of growth of a particular child at the end of the intervention. For all models, time was encoded so that the final assessment point of the intervention phase (Time 4) was 0, meaning that the first assessment was entered as Time = -3, the second assessment was Time = -2, and the third assessment Time = -1. This decision was made to allow for examination of the relationship after the intervention program had been implemented. To calculate intervention integrity within this model, the percent of the overall program completed by each parent at the time of each child

assessment was calculated. Specifically, to calculate the intervention integrity for a child during the third early literacy assessment, the percentages for all lesson plans completed before the date of the third assessment were totaled and divided by the total number of lessons (i.e., 27). If the child had completed 18 lessons according to the parent's recording of the date, the percent complete of those 18 lessons was summed and then divided by 27 to yield the percentage of the overall program that the child had received before being assessed.

The results of each model will be discussed by early literacy outcome. The discussion of results will focus primarily on the fixed effects estimated since these effects are related to the research questions of interest. Prior to estimating fixed effects and variance components, models for each outcome were examined for violation of assumptions. Initially, outcome variables were assessed for skewness and kurtosis and tested for significant deviations from a normal distribution via a Shapiro-Wilk analysis. The Level Two variables were examined for skewness and kurtosis in the residuals for the estimations of the intercept and rate of growth (time), which were also examined via Shapiro-Wilk statistical analysis. In addition, the data were examined for the presence of outliers.

Letter Naming. Table 8 contains a summary of the examination of assumptions for the multilevel model of intervention integrity and letter naming outcomes. Overall, there were no significant deviations from normality. An examination of multivariate outliers revealed that there were no extreme values.

Table 8

Normality Data for Letter Naming in Integrity Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Letters	0.114	0.474	0.986	0.776
Level Two				
Intercept	-0.036	-1.280	0.932	0.323
Time	1.088	0.955	0.912	0.170

Note: *$p \leq 0.05$; **$p \leq 0.01$, $n = 13$

With data on assumptions meeting criteria for using multilevel modeling, an analysis of the fixed effects and variance components was conducted. Table 9 presents a summary of the fixed effects and variance components for the Letter Naming outcome.

Table 9

Fixed Effects and Variances for Letter Naming with Integrity

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	-0.790	0.644	-1.23	0.242
Time	-0.279	0.211	-1.33	0.208
Integrity	0.013	0.007	1.95	0.064
Time * Integrity	0.002	0.002	0.72	0.480
Variance Components			*z*	
Variation in intercepts	0.790*	0.388	2.04	0.021
Covariance between intercepts and slope	0.070	0.080	0.88	0.381
Variation in slope	0.028	0.028	0.97	0.165
Within child variance	0.145**	0.043	3.39	<0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

The results of the multilevel model did not reveal statistically significant effects for the Integrity parameter or the interaction of Time and Integrity. The estimate for the effect of Integrity was 0.013 (SE= 0.007, p= 0.064), and the interaction of time and intervention integrity yielded a parameter estimate of 0.002 (SE= 0.002, p= 0.480). The model yielded an average intercept at the end of the intervention of -0.790 (SE= 0.644, p= 0.242), indicating a negative Z-score for the composite variable of Letter Naming when all participants in the intervention group were included. The parameter estimate of

time represents growth, but was not statistically significant with a value of -0.279 (SE= 0.211, *p*= 0.208).

When examining the variances generated from the model, the variance within children was 0.145 (SE= 0.043, p< 0.001), which was statistically significant, indicating significant differences within children regarding their performance on letter naming fluency and/or knowledge. A statistically significant difference was also found for the variance of intercepts (0.790, SE= 0.388, p= 0.021). The variation in rates of growth for children (0.028, SE= 0.028, p= 0.165) and the covariance between the intercepts and slopes in the model (0.070, SE= 0.080, p= 0.381) were not statistically significant for Letter Naming outcomes.

Phonological Awareness. The multilevel model of Phonological Awareness was first assessed for the presence of non-normality and outliers at the univariate and multivariate level. A summary of the assumption data appear in Table 10. At the univariate level, no significant deviations were found. Statistically significant deviations from normality were found for the residuals of the time variable, but the skewness and kurtosis values did not indicate extreme levels of non-normality, and the multilevel model was assumed to be robust to these violations. One participant had a multivariate value that was classified as an outlier. A review of this participant's data revealed accurate observations for intervention integrity and child outcome and no errors in data entry. Therefore, this observation was retained in the analyses for the fixed effects and variance components.

Table 10

Normality Data for Phonological Awareness in Integrity Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Phonological Awareness	-0.133	1.336	0.979	0.477
Level Two				
Intercept	-0.439	-0.951	0.943	0.460
Time	1.559	1.382	0.768**	0.002

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

Table 11 contains a summary of the fixed effects and variance components for the composite variable of Phonological Awareness.

Table 11

Fixed Effects and Variances for Phonological Awareness with Integrity

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	0.789	0.701	1.13	0.281
Time	0.287	0.246	1.17	0.265
Integrity	-0.003	0.008	-0.35	0.732
Time * Integrity	0.005*	0.002	2.58	0.017
Variance Components			*z*	
Variation in intercepts	0.941*	0.411	2.29	0.011
Covariance between intercepts and slope	0.232	0.144	1.61	0.107
Variation in slope	0.154*	0.072	2.13	0.017
Within child variance	0.098**	0.029	3.44	<0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

The model for Phonological Awareness resulted in a statistically significant interaction between Time and Integrity with a parameter estimate of 0.005 (SE= 0.002, p= 0.017). This indicates that for each 1 unit increase in intervention integrity, the rate of growth for the child was an approximately 0.005 increase in the child's rate of growth. The average intercept at the end of the intervention was estimated to be 0.789 (SE= 0.701, p= 0.281), indicating an overall positive Z-Score for the composite variable of Phonological Awareness. The parameter estimates of time (0.287, SE= 0.246, p= 0.265) or Integrity (-0.003, SE= 0.008, p= 0.732) were not statistically significant.

When examining the variances of the model, the variance within children was 0.098 (SE= 0.029, p< 0.001), which was statistically significant, indicating significant differences within children on their ability to perform Phonological Awareness skills. A statistically significant difference was also found for the variance in intercepts (0.941, SE= 0.411, p= 0.011), and for the variation in rates of growth for children (0.154, SE= 0.072, p= 0.017). The covariance between the intercepts and slopes in the model (0.232, SE= 0.144, p= 0.107) was not statistically significant for Phonological Awareness outcomes.

Vocabulary/ Oral Language. An examination of whether Vocabulary/Oral Language outcomes and the model met assumptions for multilevel modeling was conducted and a summary is presented in Table 12. No statistically significant deviations were noted in the Level One or Level Two variables. When examining outliers, none were found in either univariate or multivariate examinations.

Table 12

Normality Data for Vocabulary/Oral Language in Integrity Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Vocabulary/Oral Language	0.009	-0.438	0.987	0.816
Level Two				
Intercept	0.081	-1.241	0.944	0.465
Time	1.061	1.806	0.924	0.248

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

The fixed effects and variance components for the model analyzing Vocabulary and Oral Language outcomes appears in Table 13.

Table 13

Fixed Effects and Variances for Vocabulary/Oral Language with Integrity

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	29.635**	3.285	9.02	< 0.001
Time	3.617**	1.154	3.13	0.008
Integrity	-0.061	0.037	-1.64	0.113
Time * Integrity	-0.040*	0.017	-2.30	0.030
Variance Components			*z*	
Variation in intercepts	2.650	4.051	0.65	0.257
Covariance between intercepts and slope	0.418	1.064	0.39	0.694
Variation in slope	0	.	.	.
Within child variance	10.896**	2.518	4.33	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

The model predicting Vocabulary/Oral Language skill performance resulted in statistically significant estimates for most fixed effects. A statistically significant interaction was found between Time and Integrity in an unexpected direction with a parameter estimate of -0.040 (SE= 0.017, p= 0.030). This indicates that for each 1-unit increase in intervention integrity there was a 0.040 decrease in rate of growth. The average intercept at the end of the intervention was estimated to be 29.635 (SE= 3.285, p< 0.001). The parameter estimate for time, a variable for examining growth, was statistically significant (3.617, SE= 1.154, p= 0.008). This estimate indicates that over each assessment point, the rate of growth of the average child was 3.617 points in Vocabulary/Oral Language score. The estimate for Intervention Integrity was not statistically significant (-0.061, SE= 0.037, p= 0.113).

When examining the variances of the model, the variance within children was 10.896 (SE= 2.518, p< 0.001), which was statistically significant, indicating significant differences within children on vocabulary and oral language abilities as assessed by the PELI. No other statistically significant variances were found for this model. The variance for intercepts was 2.650 (SE= 4.051, p= 0.257), and the covariance between intercept and rate of growth (slope) was 0.418 (SE= 1.064, p= 0.694). The variation in slope was estimated to be 0, indicating minimal variation in children's slopes that did not allow for it to be estimated.

Comprehension. The final model examined the relationship between intervention integrity and Comprehension performance from the PELI assessment. A summary of the data examining whether the dataset meets assumptions for using multilevel models appears in Table 14.

Table 14

Normality Data for Comprehension in Integrity Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Comprehension	-0.399	-0.308	0.972	0.241
Level Two				
Intercept	-0.847	-0.018	0.913	0.174
Time	2.084	4.405	0.736**	<0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

Some deviations from normality were noted within the residuals for the Time variable, which had statistically significant deviations from normality within this analysis, but skewness and kurtosis values were not extreme. An outlier was observed in the comprehension outcomes, but when this value was examined, it is an accurate value. There was one child participant who continually had low comprehension scores on the PELI and while the value is an outlier, it represents a child's true performance and was therefore retained.

Table 15 contains a summary of the estimation of fixed effects and variance components.

Table 15

Fixed Effects and Variances for Comprehension with Integrity

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	17.648**	3.107	5.68	< 0.001
Time	2.544*	1.084	2.35	0.036
Integrity	-0.033	0.035	-0.96	0.346
Time * Integrity	-0.003	0.013	-0.22	0.831
Variance Components			*z*	
Variation in intercepts	6.140	4.927	1.25	0.106
Covariance between intercepts and slope	1.376	2.034	0.68	0.499
Variation in slope	0.852	1.038	0.82	0.206
Within child variance	5.752**	1.695	3.39	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$, $n = 13$

The results of the analysis examining integrity and Comprehension performance did not reveal a statistically significant effect for the interaction of Time and Intervention integrity, or for Intervention Integrity alone. The interaction of Time and Integrity yielded a parameter estimate in an unexpected direction of -0.003 (SE= 0.013, p= 0.831). The parameter estimate of Integrity was -0.033(SE= 0.035, p= 0.346). The model yielded an average intercept at the end of the intervention of 17.648 (SE= 3.107, p< 0.001) and an estimate for the Time effect of 2.544 (SE= 1.084, p= 0.036), which were both statistically significant. The intercept indicates that the average Comprehension score at

the end of the intervention was approximately 17.5 points earned and the average child within the study possessing a positive rate of growth of approximately 2.5 Comprehension points gained at each assessment.

When examining the variances generated from the model, the only statistically significant variance was found within children (5.752, SE= 1.695, $p< 0.001$). This value indicates the presence of significant differences within children regarding their performance on the Comprehension questions in the PELI. No other statistically significant variances were found for this model. The variance for intercepts was 6.140 (SE= 4.927, $p= 0.106$), and the variance for rates of growth was 0.852 (SE= 1.038, $p= 0.206$). The covariance between the intercepts and rates of growth was 1.376 (SE=2.034, $p= 0.499$) which was not statistically significant for the Comprehension outcomes.

Summary of Multilevel Modeling Results for Intervention Integrity. The effects of Integrity and the interaction of Integrity and Time failed to reveal statistically significant predictions for all of the child outcome measures. However, two areas did yield statistically significant results. When examining the Phonological Awareness and Vocabulary/Oral Language outcome variables, the interaction of the Integrity and Time was found to be statistically significant. In addition, all four models revealed statistically significant differences within children on completing the early literacy skill tasks.

Inclusion in Analyses Based on Level of Intervention Integrity. The wide range of intervention integrity values observed within the intervention group through both direct observation and lesson plan self-report prompted the need to examine whether certain participants in the intervention group truly received enough of the intervention to be included in analyses of effectiveness. Three children received less than seventy

percent of the early literacy program, resulting in limited to no exposure to the second type of question in Sound Practice (e.g., Tell me the first sound in *cake*) and less exposure to letter name tasks. Both forms of intervention integrity data also displayed a clear division within the families, with 10 families completing 90% or more of the lesson plan steps and the three families completing 60% or less. Therefore, a decision was made to conduct a sensitivity analysis for multilevel models examining the effectiveness of the intervention program compared to the control group. The sensitivity analysis was conducted by first analyzing the data with all participants within the data set. The second analysis was conducted with the three parents who showed low adherence to intervention procedures removed along with the corresponding families that the children were originally matched with. In all analyses of effectiveness, the data evidenced (1) more normal distributions and (2) greater levels of significance when only families who had higher levels of intervention integrity (70% or more) were included. Therefore, analyses of effectiveness are reported using the inclusion criteria of 70% or higher integrity, as this subsample is more likely to show the effectiveness of the intervention as opposed to the effects of lack of exposure to the intervention program.

Intervention Effectiveness Results

Multilevel modeling was employed to examine the effects of the intervention and control conditions on each of the early literacy outcome measures. This method of analysis was selected over other potential methods for several reasons. First, multilevel modeling takes into account the nesting present within this data set, with observations of skills at different time points within each child. Second, multilevel modeling allows for retention of participants who have missing data points, maintaining a larger sample than

other methods which would require either imputation or removal of participants with missing data. A final strength of multilevel modeling is that it yields better standard error estimates for the fixed effects (Stevens, 2009).

The model employed in the analyses was identical for each early literacy outcome. At Level One the child outcomes were modeled as:

$$\text{Early Literacy Outcome } (\gamma_{ij}) = \pi_{0j} + \pi_{1j} \text{ (Time)} + e_{ti}$$

where $\pi_{0j}$is the literacy skill performance at the end of the intervention (Assessment at Time 4) for the child j, $\pi_{1j}$is the coefficient for the rate of growth over time, and e_{ti} represents the error within the estimation of the Level One Model. The equations for Level Two were:

$$\pi_{0j} = \beta_{00} + \beta_{01} \text{ (Intervention)} + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11} \text{ (Intervention)} + r_{1j}$$

where $\beta_{00}$is the average intercept for the control group (coded as 0 for Intervention) at the end of the intervention (Time coded as 0), β_{01} is the difference between the intervention and control group in level or score for a child in the intervention group at the end of the intervention, $\beta_{10}$is the rate of growth observed on the skill in for children in the control group, and β_{11} is the coefficient for the difference in rate of growth for the intervention group from the control group. For all models, the variable was coded in reverse to allow for estimation of difference at the conclusion of the intervention. Therefore, Time 5 was coded as 1, Time 4 was coded as 0, Time 3 was -1, Time 2 was -2, and the first assessment was coded as -3. Results of the multilevel modeling for each early literacy outcome will be discussed by first examining the data for normality and the presence of outliers to assess whether data met assumptions, and concluding with reporting of the

fixed effects and variance components. The primary focus of each model will be on the estimated fixed effects which provide information regarding intervention effectiveness.

Letter Naming. The use of multilevel modeling requires that several assumptions be examined. An assumption within multilevel modeling is that variables follow normal distributions. To examine the assumptions for letter naming outcomes, the data were examined for skewness, kurtosis, and the presence of outliers, and subjected to a Shapiro-Wilk test of normality. Skewness is a measure of the symmetry of the distribution and kurtosis is a measure of the degree of peaks or flatness of the distribution and reports on how different the data are from a normal distribution. Results of the assumption analyses are presented in Table 16.

Table 16

Normality Data for Letter Naming Composite in Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Letter Naming	0.218	-0.293	0.985	0.281
Level Two				
Intercept	0.103	-0.931	0.964	0.580
Time	0.406	0.115	0.958	0.444

Note: * $p \leq 0.05$; ** $p \leq 0.01$

The parameters and variances of the multilevel model examining the differences between the intervention and control groups on letter naming outcomes are reported in Table 17. The information is presented graphically in Figure 1. The model was created

with the data set of families who had over 70% intervention integrity and the matched pairs in the control group, with a sample size of 20.

Table 17

Fixed Effects and Variances for Letter Naming Composite

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	-0.353	0.225	-1.57	0.132
Time	-0.089	0.057	-1.51	0.147
Intervention	0.790*	0.318	2.48	0.016
Time * Intervention	0.231**	0.081	2.85	0.006
Variance Components			*z*	
Variation in intercepts	0.510**	0.176	2.90	0.002
Covariance between intercepts and slope	0.001	0.032	0.02	0.980
Variation in slope	0.021*	0.012	1.82	0.034
Within child variance	0.146**	0.026	5.58	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

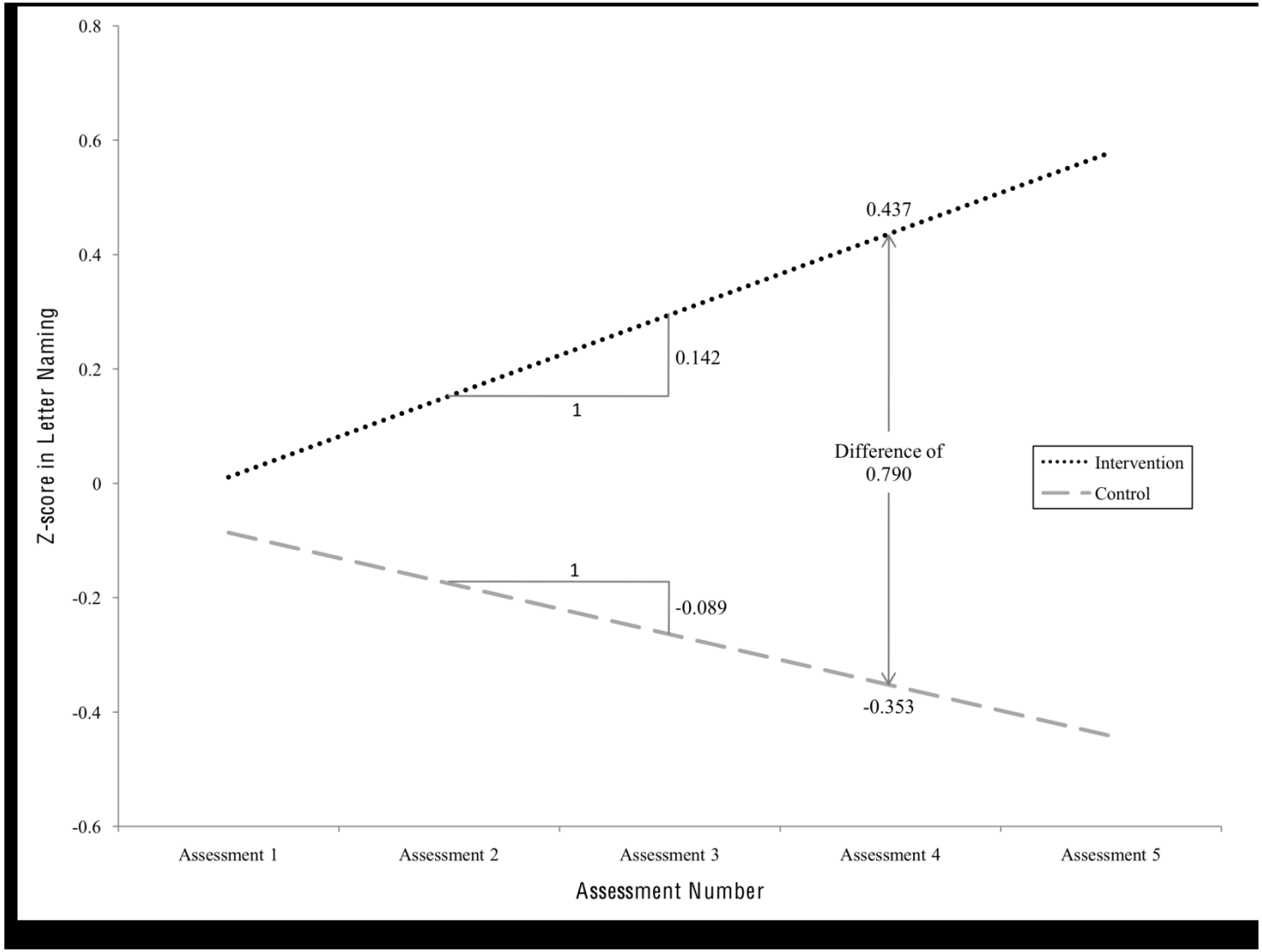

*Figure 1.*Multilevel Model of Intervention and Control Groups on Letter Naming Composite

The model for Letter Naming Composite outcomes resulted in statistically significant parameter estimates for Intervention and the interaction between Time and Intervention. The Intervention had a parameter estimate of 0.790 (SE= 0.318, p= 0.016), and the interaction between Intervention and Time was estimated to be 0.231 (SE= 0.081, p= 0.006). The effect of the Intervention indicates that at the end of the intervention, children in the intervention group had an average Z-score that was 0.790 units higher than the control group. The interaction of Intervention and Time indicates that the children in the intervention condition had a rate of growth that was 0.231 units higher than the control group. As shown in Figure 1, the intervention group's average rate of growth was estimated to be 0.142, which was arrived at by adding the control groups rate of growth (-0.089) and the effect for Time of the Intervention group (0.231). The Intercept parameter represents the average Z-score level of the control group at the end of the intervention and was estimated to be -0.353 (SE=0.225, p= 0.132), indicating an overall negative Z-score for the control group. The average rate of growth for the control group (Time) was -0.089 (SE= 0.057, p= 0.147), which represents a negative rate of growth for the control group in terms of composite Z-Scores across each time point.

When examining the variances of the model, the variance within children was 0.146 (SE= 0.026, p< 0.001), which was statistically significant, indicating significant differences within children on their ability to perform letter naming skills. A statistically significant difference was also found for the variance for intercepts (0.510, SE= 0.176, p= 0.002), and for the variation in rates of growth for children (0.021, SE= 0.012, p= 0.034). The covariance between the intercepts and slopes in the model (0.001, SE= 0.032, p= 0.980) was not statistically significant for Letter Naming outcomes.

Phonological Awareness. The assumptions for multilevel modeling of Phonological Awareness Composite outcomes were examined through a variety of methods. The results of the assumption analyses are presented in Table 18.

Table 18

Normality Data for Phonological Awareness Composite in Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Phonological Awareness	0.693	3.550	0.944**	0.002
Level Two				
Intercept	0.162	-0.711	0.959	0.472
Time	2.367	4.529	0.778**	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

The data for the Phonological Awareness composite had some statistically significant deviations from normality in terms of kurtosis within the Level One and Level Two distributions. However, the level of kurtosis was not considered an extreme value and the multilevel models are likely to be robust to violation of this assumption. When examining outliers, one participant's data resulted in a multivariate outlier, but the data were reviewed and found to be true values for that participant. Therefore, it was retained within the final analysis.

The parameters and variances of the multilevel model examining the differences between the intervention and control groups on Phonological Awareness outcomes are reported in Table 19. Figure 2 contains a graphic representation of the levels and rates of growth over time for the two groups on Phonological Awareness outcomes. The model

was created with the data set of families who had over 70% intervention integrity and the matched pairs in the control group, resulting in a sample size of 20.

Table 19

Fixed Effects and Variances for Phonological Awareness Composite

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	-0.326	0.238	-1.37	0.186
Time	-0.124	0.069	-1.80	0.088
Intervention	0.760*	0.337	2.26	0.028
Time * Intervention	0.344**	0.098	3.50	< 0.001
Variance Components			*z*	
Variation in intercepts	0.567**	0.199	2.85	0.002
Covariance between intercepts and slope	0.030	0.042	0.72	0.473
Variation in slope	0.035*	0.017	2.04	0.021
Within child variance	0.179**	0.032	5.57	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

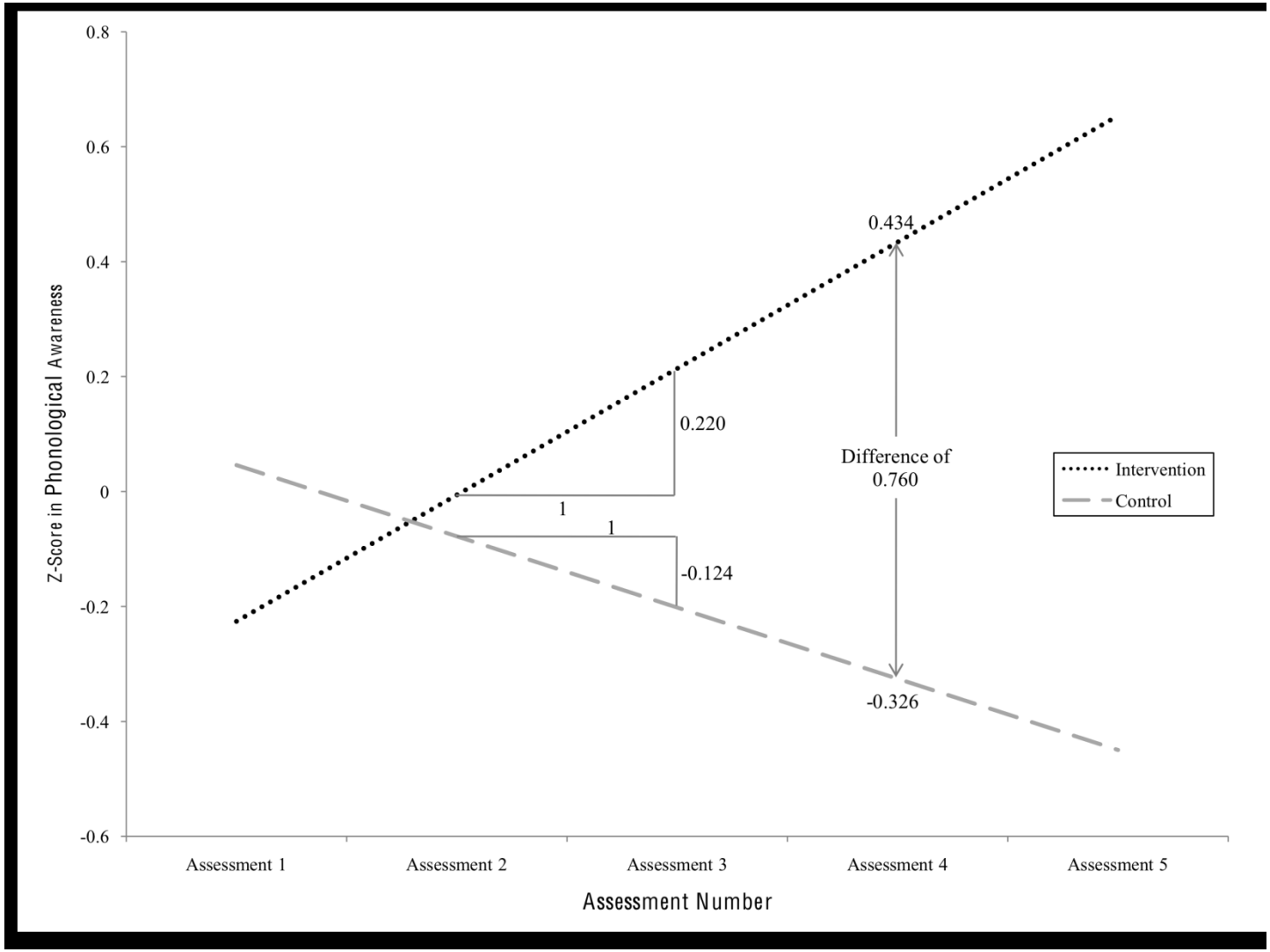

Figure 2. Multilevel Model of Intervention and Control Groups on Phonological Awareness Composite

The model for Phonological Awareness composite outcomes resulted in statistically significant estimates for the Intervention (0.760, SE=0.337, p= 0.028) and the interaction between Time and Intervention (0.284, SE= 0.094, p= 0.004). The Intercept value represents the Z-score of the average control group participant at the end of the intervention, indicating a performance below the mean of the sample (-0.326, SE=0.238, 0.186). The rate of growth for the control group was estimated to decrease across time with an average value of -0.124 (SE= 0.069, p= 0.088). The rate of growth for the intervention group is shown in Figure 2 as 0.220 which was arrived at by summing the control groups rate of growth (-0.124) and the interaction of Time and the Intervention (0.344). As shown in Figure 2, the difference in level at the end of the intervention between the two groups was 0.760 Z-score units, indicating a significant difference between the intervention and control groups on Phonological Awareness abilities.

When examining the variances of the model, the variance within children was 0.179 (SE= 0.032, p< 0.001), which was statistically significant, indicating significant differences within children on their ability to perform phonological awareness skills. A statistically significant difference was also found for the variance for intercepts (0.567, SE= 0.199, p= 0.002), and for the variation in rates of growth for children (0.035, SE= 0.017, p= 0.021). The covariance between the intercepts and slopes in the model (0.030, SE= 0.042, p= 0.473) was not statistically significant for Phonological Awareness outcomes.

Vocabulary/Oral Language. The assumptions for Vocabulary/ Oral Language outcomes were examined through a variety of methods. The results of the assumption analyses are presented in Table 20.

Table 20

Normality Data for Vocabulary/Oral Language in Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Vocabulary/ Oral Language	-0.499	0.885	0.982	0.163
Level Two				
Intercept	-1.55	2.537	0.853**	0.004
Time	1.717	2.637	0.798**	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

The data for the Vocabulary/ Oral Language outcomes has some skewness and kurtosis at statistically significant levels in the Level Two residual distributions. However, multilevel models have some robustness against violating the normality assumption, especially if the kurtosis values are not extreme. An examination of outliers found one outlier at the univariate level and two at the multivariate level. The data were checked for accuracy and were retained within the dataset for analysis.

The parameters and variances of the multilevel model examining the differences between the intervention and control groups on Vocabulary/ Oral Language outcomes are reported in Table 21 and a graphical representation appears in Figure 3. The model was created with the data set of families who had adequate intervention integrity and the matched pairs in the control group, resulting in a sample size of 20.

Table 21

Fixed Effects and Variances for Vocabulary/Oral Language Outcome

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	19.863**	1.038	19.14	< 0.001
Time	0.482	0.379	1.27	0.219
Intervention	4.659**	1.476	3.16	0.003
Time * Intervention	1.105*	0.538	2.05	0.044
Variance Components			*z*	
Variation in intercepts	6.998*	3.832	1.83	0.034
Covariance between intercepts and slope	-1.061	1.341	-0.79	0.429
Variation in slope	0	.	.	.
Within child variance	15.676**	2.439	6.43	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

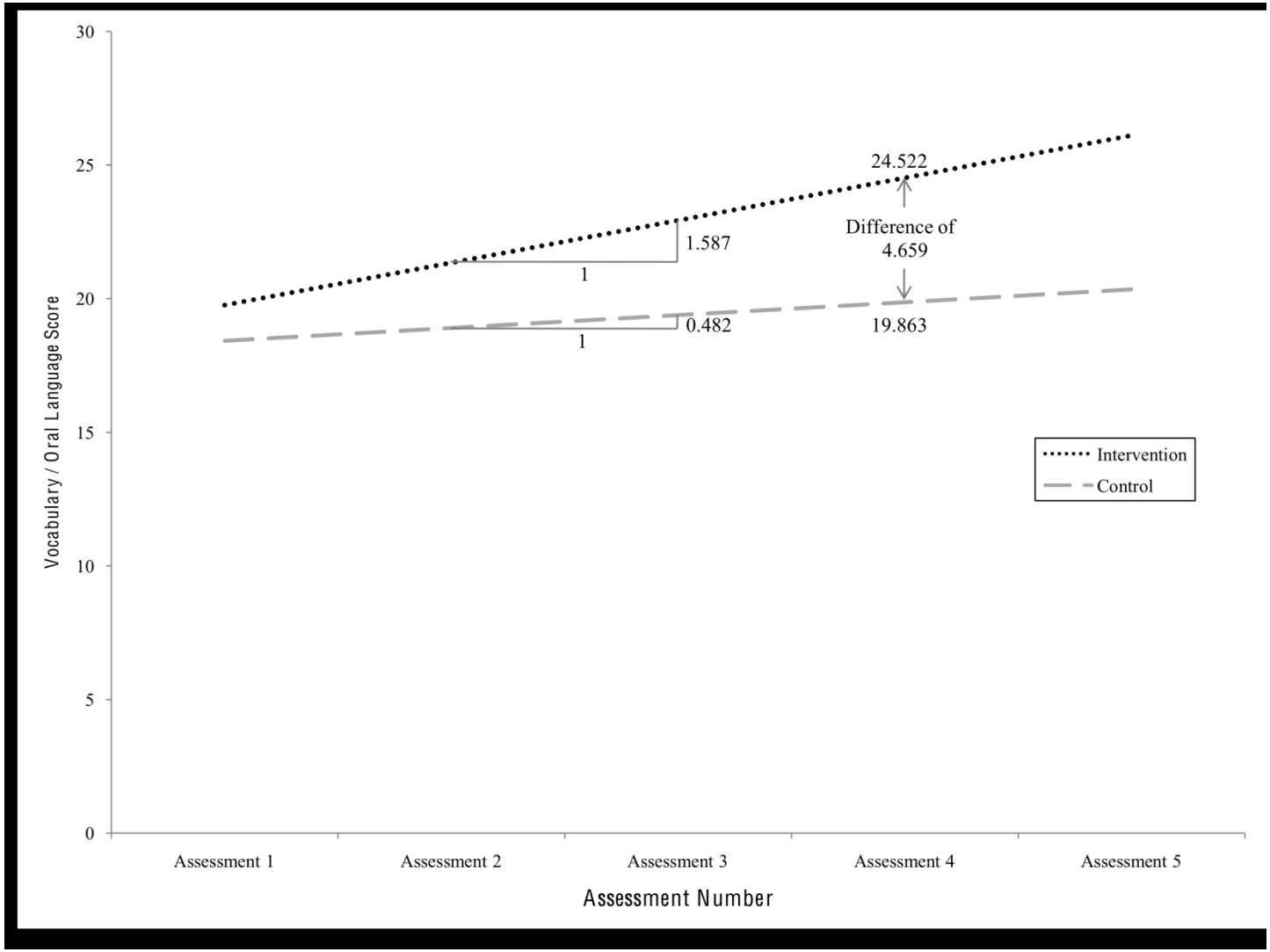

Figure 3. Multilevel Model of Intervention and Control Groups on Vocabulary/Oral Language

The model for Vocabulary/ Oral Language outcomes resulted in statistically significant estimates for the Intervention and the interaction between Time and Intervention. The intervention resulted in an increase in level of performance at the end of the intervention over the control group estimated to be 4.659 (SE= 1.476, p= 0.003). The intervention also resulted in increases in the rate of growth over the control group estimated to be 1.105 (SE= 0.538, p= 0.044). The Intercept represents the average performance of the control group at the end of the intervention, which was 19.863 (SE= 1.038, p< 0.001) and was statistically significant. The parameter estimate for Time was 0.482 (SE= 0.379, p= 0.219), and represents the rate of growth over time for the control group. The rate of growth of the intervention group was over triple the control group and calculated to be 1.587 by summing the control group's rate of growth (0.482) and the increase in rate of growth for the intervention group (1.105).

When examining the variances of the model, the variance within children was 15.676 (SE=2.439, p< 0.001), which was statistically significant, indicating significant differences within children on their ability to perform Vocabulary/Oral Language skills. A statistically significant difference was also found for the variance for intercepts (6.998, SE= 3.832, p= 0.034). The variation in rates of growth for children was very small and was not fully estimated by the statistical software, yielding an estimate of 0. The covariance between the intercepts and slopes in the model (-1.061, SE=1.341, p= 0.429) was not statistically significant for Vocabulary/Oral Language outcomes.

Comprehension. The assumptions for Comprehension outcomes were examined through a variety of methods. The results of the assumption analyses are presented in Table 22.

Table 22

Normality Data for Comprehension in Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Comprehension	0.019	-0.463	0.990	0.649
Level Two				
Intercept	-0.764	0.190	0.941	0.210
Time	1.149	0.649	0.863*	0.006

Note: * $p \leq 0.05$; ** $p \leq 0.01$

The data for the Comprehension outcomes was found to meet normality assumptions at Level One. The presence of non-normality was indicated by the Shapiro-Wilk analysis for the residuals of the Time variable. However, multilevel models have some robustness against violating this assumption, especially if the values are not extreme. One participant was identified to have data that represented a multivariate outlier, but this value contained no errors in data entry and was retained in the final analysis.

The parameters and variances of the multilevel model examining the differences between the intervention and control groups on Comprehension outcomes are reported instable 23 and represented graphically in Figure 4. The model was created with the data set of families who had adequate intervention integrity and the matched pairs in the control group, resulting in a sample size of 20.

Table 23

Fixed Effects and Variances for Comprehension Outcome

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	10.182**	0.930	10.95	< 0.001
Time	0.527*	0.244	2.16	0.043
Intervention	4.220**	1.319	3.20	0.002
Time * Intervention	0.983**	0.347	2.84	0.006
Variance Components			*z*	
Variation in intercepts	7.593**	3.008	2.52	0.006
Covariance between intercepts and slope	-0.237	0.576	-0.41	0.681
Variation in slope	0.030	0.239	0.13	0.449
Within child variance	6.192**	1.109	5.58	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

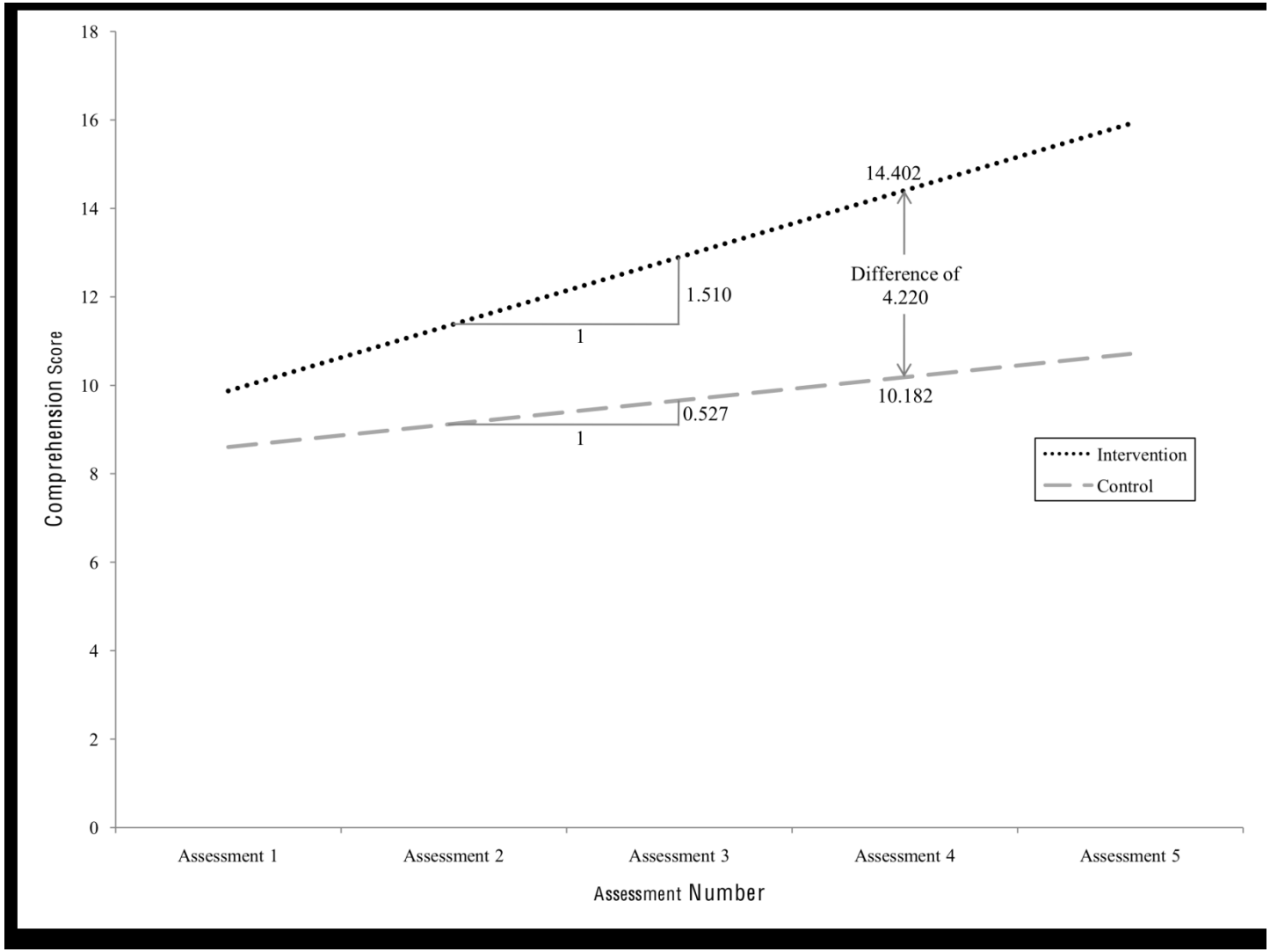

Figure 4. Multilevel Model of Intervention and Control Groups on Comprehension

The model for Comprehension outcomes produced statistically significant values for all fixed effects. The average performance of a child within the control group at the end of the intervention was estimated to be 10.182 (SE= 0.930, p< 0.001). The effect of the intervention resulted in a 4.220 (SE= 1.319, p= 0.002) increase in level over the control group at the end of the intervention, represented in Figure 4 as 14.402. The average rate of growth for the control group (Time) was estimated to be 0.527 (SE= 0.244, p= 0.043), and the interaction of Time and Intervention resulted in an estimated parameter of 0.983 (SE= 0.347, p= 0.006). The rate of growth of the intervention was calculated by summing these numbers and appears in Figure 4 as 1.510, which is more than double the average rate of growth of the children in the control group.

When examining the variances of the model, the variance within children was 6.192 (SE= 1.109, p< 0.001), which was statistically significant, indicating significant differences within children on their ability to correctly answer Comprehension questions. A statistically significant difference was also found for the variance for intercepts (7.593, SE= 3.008, p= 0.006). Neither the variation in slopes or the covariance between intercepts and slopes were statistically significant. The variation in slope was estimated to be 0.030 (SE= 0.239, p= 0.449) and the covariance was -0.237 (SE= 0.576, p= 0.681).

Summary of Results Related to Intervention Effectiveness. The early literacy skill intervention resulted in statistically significant increases in children's level of performance and rate of growth in all skills examined. For the Letter Naming and Phonological Awareness composite variables, the rates of growth were positive compared to the negative rates of growth for the control group. In addition, the Z-scores of the intervention group fell more than 0.750 units above the control group at the end of the

intervention phase. When examining the Vocabulary/Oral Language and Comprehension outcomes, children in the intervention group were estimated to have rates of growth 2-3 times higher than the control group and perform on average over 4 points higher on the assessments at the end of the intervention phase. All multilevel models assessing each early literacy outcome also had statistically significant levels of variance within children and statistically significant variance for each child's level of performance at the end of the intervention period.

Results for Variety of Activities

Descriptive Statistics of Variety of Early Learning Activities. Results of the pilot study of this early literacy intervention program found anecdotal evidence that parents were engaging in different learning activities outside of the program (Sundman, 2009). Activities parents reported engaging in included both reading activities and other activities associated with early writing and mathematics skills. To record the number of different activities parents engaged in over time, the Home Activities Questionnaire was created. A copy of the Home Activities Questionnaire appears in Appendix F. To calculate the variety of activities parents engaged in over the past week, each activity reported by the parent was counted as one activity. Then, all the activities were summed for each of the three times that the parents completed the questionnaire. The parents could report engaging in 13 activities and fill in an additional three activities that may not have been included as pre-set options. Table 24 contains the mean, standard deviation, and range for the treatment and control groups and for the entire sample. The intervention group average increased through each assessment point, with parents reporting engaging in 1 to 2 more activities (change in μ of 1.582) from the beginning of

the study. In contrast, parents in the control group remained relatively consistent in terms of the group average (change in μ of -0.273). However, to examine whether these differences in means are statistically significant, multilevel modeling was employed.

Table 24

Descriptive Statistics for Variety of Activities

	Intervention Group			*Control Group*			*Total Sample*		
	μ	SD	Range	μ	SD	Range	μ	SD	Range
Time 1	9.818	3.516	2-15	10.273	1.794	7-12	10.045	2.734	2-15
Time 2	10.182	1.401	7-11	9.556	1.509	7-11	9.900	1.447	7-11
Time 3	11.400	1.897	8-15	10.000	2.569	3-12	10.667	2.331	3-15

Multilevel Models of Intervention Effects on Variety of Early Learning Activities. Multilevel modeling was employed to examine the effects of the intervention and control conditions on the variety of activities parent reported engaging in within the household.

The model employed in the analysis had the following structure for Level One:

$$\text{Variety of Activities } (\gamma_{ij}) = \pi_{0j} + \pi_{1j} \text{ (Time)} + e_{ti}$$

where π_{0j} is the average number of activities at the end of the research study for the family j, π_{1j} is the coefficient for the rate of rate of growth over time in the number of activities , and e_{ti} represents the error within the estimation of the Level One Model. The equations for Level Two were:

$$\pi_{0j} = \beta_{00} + \beta_{01} \text{ (Intervention)} + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11} \text{ (Intervention)} + r_{1j}$$

where β_{00} is the average intercept for the control group (coded as 0 for Intervention) at the end of the intervention (Time coded as 0), β_{01} is the difference between the intervention and control group at the end of the intervention, β_{10} is the rate of growth observed in the variety of activities in the control group, and β_{11} is the coefficient for the difference in rate of growth for the intervention group from the control group. For this model, the variable of Time was coded in reverse to allow for estimation of differences at the conclusion of the intervention. Therefore, the final assessment was coded as Time 0, the middle assessment was coded as Time -1, and the first assessment was coded as -2. Results of the multilevel modeling for variety of activities will be discussed by first examining the assumptions for multilevel modeling of normality and the presence of outliers and then reporting of the fixed effects and variance components.

Examination of Assumptions. The assumptions for Variety of Activities parents engaged in were examined through a numerous statistical methods. The results of the assumption analyses are presented in Table 25.

Table 25

Normality Data for Variety of Activities in the Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Variety of Activities	-1.019	2.369	0.932**	0.002
Level Two				
Intercept	-1.422	2.534	0.873**	0.009
Time	2.732	4.923	0.710**	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

The data for the variety of activities did demonstrate deviation from the normal distribution in all Level One and Level Two data according to the Shapiro-Wilk analyses. Although the skewness and kurtosis values are statistically significant, multilevel modeling analyses are generally robust to mild violations of this assumption and none of the kurtosis values exceeded 5. Outliers were found at the univariate and multivariate levels, but upon examination of these values they each represented true data points reported by the parents.

Multilevel Model Results. The parameters and variances of the multilevel model examining the differences between the intervention and control groups on a variety of activities are reported in Table 26. Figure 5 presents a graphical representation of the fixed effects.

Table 26

Fixed Effects and Variances for Variety of Activity Outcomes

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	9.877**	0.626	15.78	< 0.001
Time	-0.136	0.445	-0.31	0.763
Intervention	1.391	0.896	1.55	0.137
Time * Intervention	0.933	0.637	1.47	0.159
Variance Components			*z*	
Variation in intercepts	2.139	1.514	1.41	0.079
Covariance between intercepts and slope	0.579	0.903	0.64	0.522
Variation in slope	0.917	0.809	1.13	0.129
Within family variance	2.527**	0.799	3.16	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

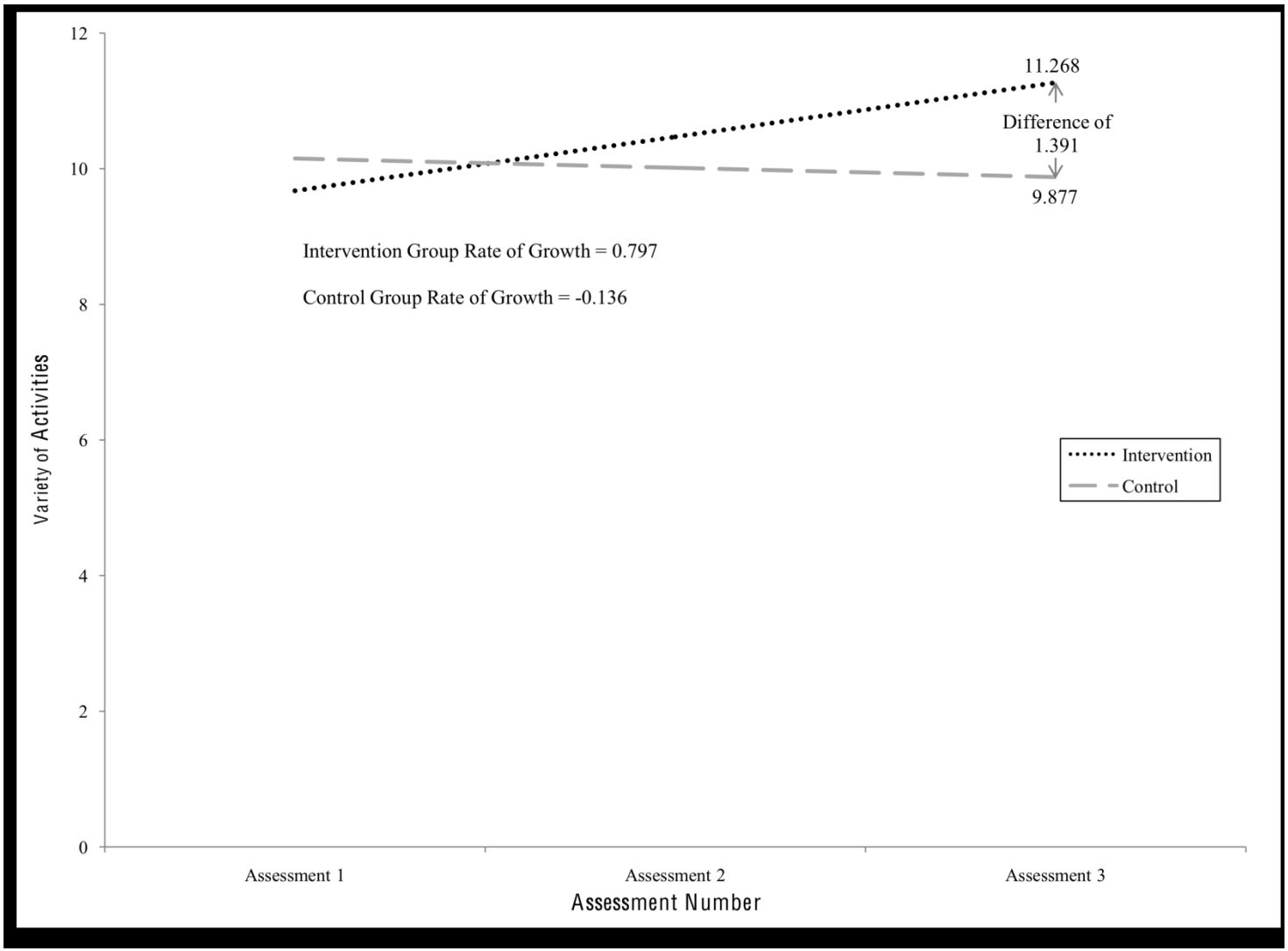

Figure 5. Multilevel Model of Intervention and Control Groups on Variety of Activities

The model for Variety of Activities did not result in statistically significant effects for the intervention over the course of the study. The number of activities reported by the average parent in the control group at the end of the intervention was 9.877 (SE= 0.626, $p< 0.001$), which was statistically significant. The effect of the intervention was 1.391 (SE= 0.896, $p= 0.137$), meaning that the number of activities the average parent in the intervention group at the end of the intervention was estimated to be 11.268, as shown in Figure 5. The average rate of growth within the control group showed a decrease over the course of the study (-0.136, SE= 0.445, $p= 0.736$). In contrast the effect of Intervention over Time was 0.933 (SE= 0.637, $p= 0.159$), indicating that the average parent in the intervention group had a small increase in the variety of activities completed at home. The rate of growth for parents in the intervention group was calculated to be 0.797, as shown in Figure 5.

The variance components of the model were not statistically significant with the exception of the within family variance which was 2.527 (SE= 0.799, $p< 0.001$), indicating significant differences within families in the variety of activities they reported. The variation in intercepts (2.139, SE= 1.514, $p= 0.079$), variation in slope (0.917, SE= 0.809, $p= 0.129$), and covariance between slopes and intercepts (0.579, SE= 0.903, $p= 0.522$), were all non-significant.

Results for Frequency of Activities

Descriptive Statistics of Frequency of Engagement in Early Learning Activities. The frequency that parents reported engaging in early learning activities was collected through completion of the Home Activities Questionnaire. A copy of the Home Activities Questionnaire appears in Appendix F. To calculate the frequency of activities

parents engaged in over the past week, the parents reported how many times they completed specific early learning tasks. Parents could report the frequency of engagement from never (coded as 0) up through more than 8 times (coded as 8). The frequency of each activity was summed to generate a total frequency of early learning activities parents engaged in during the week prior to completing the survey. Table 27 contains the mean, standard deviation, and range for the treatment and control groups and for the entire sample. When examining these data, it is essential to remember that parents were instructed to not include completion of the lesson plan activities in their reports of frequency. Similar to the data on variety of activities, the average for parents in the intervention group increased at each time point, with a change in averages of 13.591 early learning activities between the beginning and end of the study. The average for the control group, in contrast, evidenced a decrease in reported activities with a drop in the group average of 11.818 activities completed throughout the week. To determine if these changes observed between the groups represented significant changes, data were placed into a multilevel model for analysis.

Table 27

Descriptive Statistics for Frequency of Activities

	Intervention Group			*Control Group*			*Total Sample*		
	μ	SD	Range	μ	SD	Range	μ	SD	Range
Time 1	54.909	28.470	4-97	54.273	28.898	10-97	54.591	27.942	4-97
Time 2	67.818	28.868	33-99	49.222	23.868	12-89	59.450	26.035	12-99
Time 3	68.500	28.706	21-106	42.455	25.235	3-80	54.857	28.588	3-106

Multilevel Models of Intervention Effects on Frequency of Early Learning Activities. Multilevel modeling was employed to examine the effects of the intervention and control conditions on the frequency of engagement in early learning activities according to parent report.

The model employed in the analysis had the following structure for Level One:

$$\text{Frequency of Activities } (\gamma_{ij}) = \pi_{0j} + \pi_{1j} \text{ (Time)} + e_{ti}$$

where π_{0j} is the average frequency of activities at the end of the research study for the family j, π_{1j} is the coefficient for the rate of rate of growth over time in the frequency of activities , and e_{ti} represents the error within the estimation of the Level One Model. The equations for Level Two were:

$$\pi_{0j} = \beta_{00} + \beta_{01} \text{ (Intervention)} + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11} \text{ (Intervention)} + r_{1j}$$

where β_{00} is the average intercept for the control group (coded as 0 for Intervention) at the end of the intervention (Time coded as 0), β_{01} is the difference between the intervention and control groups at the end of the intervention, β_{10} is the rate of growth observed in the frequency of activities in the control group, and β_{11} is the coefficient for the difference in rate of growth for the intervention group from the control group. To examine differences after the intervention was completed, the variable of Time was coded in reverse. Therefore, the final assessment was coded as Time 0, the middle assessment was coded as Time -1, and the first assessment was coded as -2. Results of the multilevel modeling for frequency of activities will begin by discussing examinations of normality and the presence of outliers to assess whether data met assumptions, and then reporting of the fixed effects and variance components of the multilevel model.

Examination of Assumptions. The assumptions for Frequency of Activities parents engaged in were examined through a variety of methods. The results of the assumption analyses are presented in Table 28.

Table 28

Normality Data for Frequency of Activities in the Multilevel Model

	Skewness	*Kurtosis*	*Shapiro-Wilk value*	*p-value*
Level One				
Frequency of Activities	-0.038	-0.650	0.984	0.584
Level Two				
Intercept	-0.004	-0.406	0.975	0.829
Time	1.969	4.434	0.787**	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

The data for the frequency of activities did demonstrate some deviations from the normal curve in the residuals for Time. Although the Shapiro-Wilk assessment was statistically significant, multilevel modeling analyses are generally robust to mild violations of the normality assumption. The skewness and kurtosis values were determined to not be extreme and the data were analyzed without transformation. No outliers were found at the univariate level, but a multivrariate outlier was found. Review of the data revealed that the data entry was accurate and the value was retained in analyses.

Multilevel Model Results. The parameters and variances of the multilevel model examining the differences between the intervention and control groups on variety of activities are reported in Table 29and represented graphically in Figure 6.

Table 29

Fixed Effects and Variances for Frequency of Activity Outcomes

	Parameter Estimate	SE	Test Statistic	*p*-value
Fixed Effects			*t*	
Intercept	42.977**	6.928	6.20	< 0.001
Time	-5.909	4.822	-1.23	0.235
Intervention	28.389**	9.909	2.87	0.010
Time * Intervention	13.202	6.908	1.91	0.071
Variance Components			*z*	
Variation in intercepts	88.686	206.21	0.43	0.334
Covariance between intercepts and slope	-54.911	101.79	-0.54	0.590
Variation in slope	0	.	.	.
Within family variance	511.63**	115.44	4.43	< 0.001

Note: * $p \leq 0.05$; ** $p \leq 0.01$

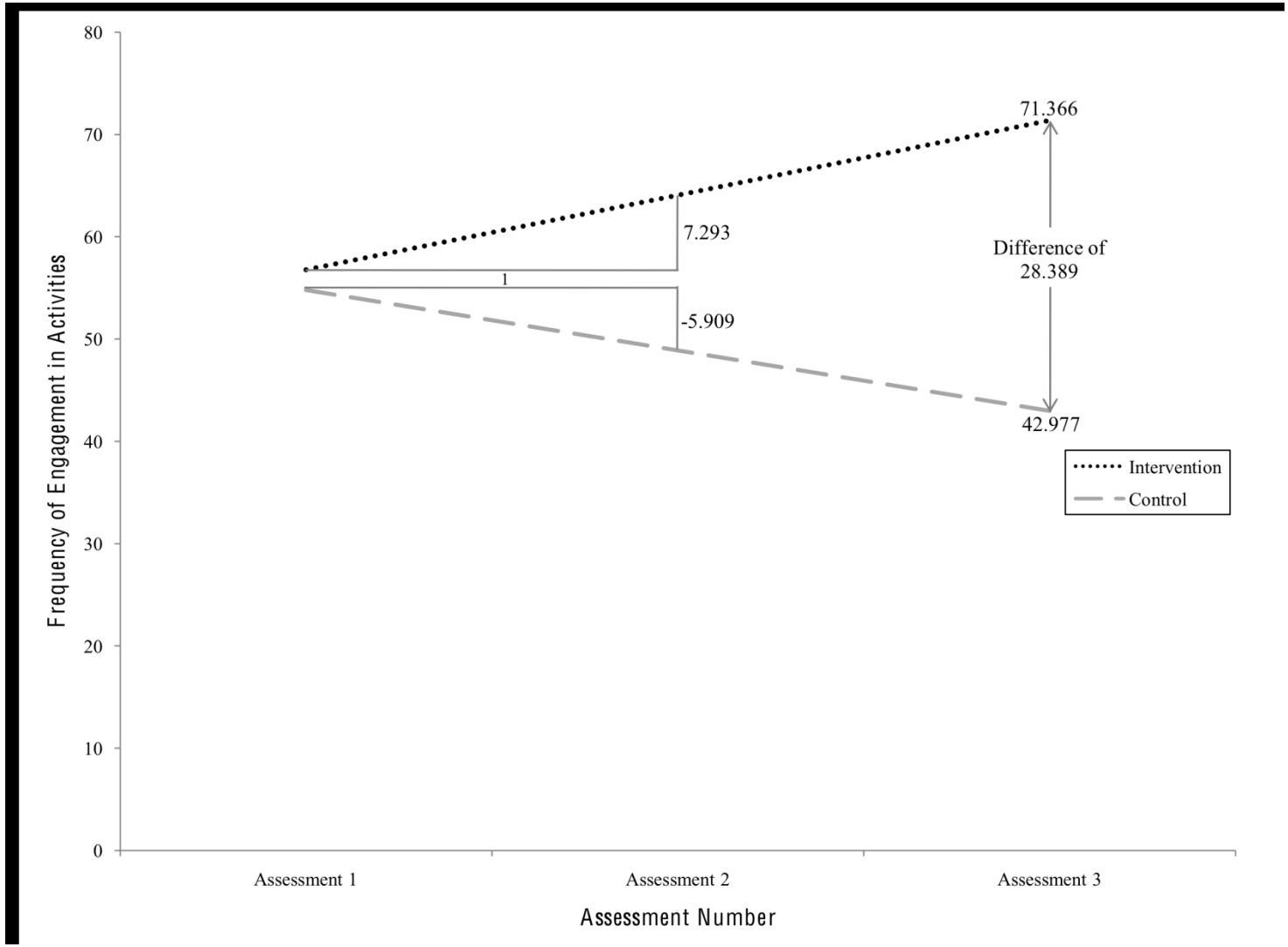

Figure 6. Multilevel Model of Intervention and Control Groups on Frequency of Engaging in Early Learning Activities

The model for the frequency of engagement in learning activities did result in a few statistically significant fixed effects. The parameter estimate for Intercept was 42.977 (SE= 6.928, p< 0.001), indicating that the average parent within the control group reported a frequency of approximately 42 activities within the past week. The effect of the Intervention was also statistically significant (28.389, SE= 9.909, p= 0.010), with an average parent in the intervention group estimated to report a frequency of 71.366 activities in the past week, as shown in Figure 6. The frequency of engagement in activities decreased during the course of the study for the control group, with a rate of growth (Time) of -5.909 (SE= 4.822, p= 0.235). In contrast, the rate of the growth of the average parent within the intervention group was positive (13.202, SE= 6.908, p= 0.071), which was estimated to be 7.293 by summing the intervention and control group's rates of growth. This rate of growth indicates that the average parent in the intervention group increased the number of early learning activities by one activity per day (or 7 within the week) at each assessment point

The variance components of the model were not statistically significant with the exception of the within family variance which was 511.63 (SE= 115.44, p< 0.001), indicating significant differences within families in the frequency of engagement in early learning activities they reported. The variation in intercepts (88.686, SE= 206.21, p= 0.334) and covariance between slopes and intercepts (-54.911, SE= 101.79, p= 0.590), were both non-significant. The variation in slope across families was not estimated by the statistical software likely due to the values being very close to 0.

Results for Intervention Acceptability

To assess parents' perceptions of the acceptability of the intervention and control conditions, parents in both groups were asked to complete the Intervention Rating Profile-13 (IRP-13). A copy of the IRP-13 appears in Appendix H. Total ratings could fall between 13 and 78. Descriptive statistics for the intervention and control groups appear in Table 30.

Table 30

Ratings of Intervention Acceptability

Group	Mean Rating	Standard Deviation	Range
Intervention	72.50	6.82	55 - 78
Control	69.69	7.25	54 - 78

The mean ratings for both groups indicate that parents perceived the intervention and control conditions as highly acceptable. An analysis of the items within the IRP-13 revealed that most parents in both groups strongly agreed that their intervention was acceptable (Question 1) and reasonable (Question 10), they would suggest use of the materials to other parents (Question 4), felt that other parents would find the materials useful (Question 6), and that the materials were beneficial for their child (Question 13). Parents in both groups also were most likely to disagree with Question 5, indicating they felt less strongly that their child's early reading skills were behind far enough to warrant intervention.

To assess whether the slightly larger IRP-13 rating by the intervention group were statistically significant, an independent means t-test was performed on the group data. Results indicated no statistically significant differences between the ratings provided by

the two groups of parents (t= 0.9977, p = 0.3299). This indicates that the small difference observed between the group means does not represent a significant difference in the perception of acceptability of the materials provided for completion at home. Both types of interventions were perceived to be highly acceptable by both groups of parents from Head Start.

Chapter Five: Discussion

The primary purpose of this study was to evaluate changes in children's early literacy skill performance levels and rates of growth in response to a parent-implemented, home-based early literacy development program. A secondary purpose of the study was to examine reported changes within the home of engagement in early learning activities. This chapter summarizes the findings of the current investigation and compares these findings to the pilot study of the intervention program. The chapter concludes with a discussion of the limitations of this study, implications for early childhood literacy and parent involvement, and future directions for research.

Responses to Research Questions

Intervention Effectiveness. The results of each of the four multilevel models examining effectiveness yielded statistically significant increases for the intervention group's level and rate of growth over the control group. When examining letter naming, children in the intervention group had a level of performance that was 0.790 Z-score units higher than the control group at the end of the intervention and the average child's performance was 0.437 standard deviations above the mean of 0. Children in the intervention group also demonstrated a positive rate of growth compared to the negative rate of growth on this skill observed in the control group. This positive rate of growth over time predicts that the children in the intervention group will be able to more accurately and quickly name letters when compared to children in the control group. The

ability to accurately and quickly state letter names has been shown to be related to greater success in reading skills during kindergarten compared to children who do not possess these skills (NRP, 2000).

The units of measure between this study and the pilot study conducted in 2009 (Sundman, 2009) were different, preventing any direct comparisons. However, both studies found statistically significant improvements in letter naming abilities for children who received the early literacy intervention program. In the pilot study, children increased their level of performance by 9.45 letters over the level of achievement predicted by their baseline trend. In the current study, which employed a control group, the typical child in the intervention group scored approximately a half standard deviation above the overall mean for the entire group. The consistent findings of statistically significant improvements in letter naming provide strong support that the intervention assists children in developing their letter naming abilities in both accuracy and fluency.

The phonological awareness abilities for children in the intervention group also improved by the end of the intervention. At the end of the intervention, the average score of a child in the intervention group was 0.760 Z-score units above the average child in the control group. In addition, children in the intervention group had a rate of growth almost one quarter of a standard deviation at each assessment point, with an estimated rate of growth of 0.220. This indicates that over the five assessment periods, the group of children that received the intervention program continued to increase their scores and as a result, scored above the overall sample average. The rate of growth for the control group was negative over the course of the intervention phase on phonological awareness. This negative growth rate is not likely to indicate a decrease in skills on phonological

awareness, but instead that the performance of children in the control group on this skill fell further and further below the group average at each time point, resulting in negative Z-scores.

As with letter naming, the units of measure for phonological awareness are not directly comparable between the current study and the pilot study. However, in the pilot study, children's scores did increase 9.2 points over the course of the study compared to the prediction of the children's baseline trends. This finding was not statistically significant (Sundman, 2009). The statistically significant improvements in phonological awareness skills found in this current study could be due to the inclusion of a larger sample allowing for detection of smaller effects (Glass & Hopkins, 1996).

The improvement in phonological awareness over the pilot study may also be due one change in the early literacy skills program. During the semi-structured interviews of the pilot study, parents reported that one type of question was difficult for their children to complete (Sundman, 2009). The question followed the format, "Tell me another word that starts the same as _____." Parents reported in the interviews that since this question was often difficult for their child, they sometimes skipped these types of questions or did not provide feedback to their child. Based on parent feedback, all questions within the lesson that took this form were removed. The removed questions were replaced by the exact same number of the other forms of phonological awareness questions (i.e., "Do ____ and ____ start the same?" and "Tell me the first sound in ____."). Therefore, the number of questions within the lesson focusing on phonological awareness was the same.

The removal of all of the "tell me another word" questions that were difficult for children to answer may have increased the impact of the phonological awareness

activities on children's skill development. By removing these questions, parents completed more of the "Sound Practice" section that centered on phonological awareness skills. By completing the questions focusing on phonological awareness, parents provided more practice opportunities for their children for phonological awareness development and also gave their children more feedback on this skill. This increased exposure to phonological awareness questions and additional corrective feedback from parents may have resulted in the children's overall increased phonological awareness scores.

Children in the intervention group also outperformed children in the control group on Vocabulary/Oral Language abilities. When compared to the pilot data for the PELI (Kaminski, 2012), the average child in the control group achieved a score consistent with the larger sample at a similar point in time during the school year. The control group and pilot study group achieved scores of 19.9 and 19.1, respectively, on this PELI scale (Kaminski, 2012). This indicates that children who received the control materials performed similarly to a larger sample of preschool children who received no intervention. At the end of the intervention, the typical child in the intervention group earned a score that was 4.7 points higher than the typical child in the control group on this section of the PELI. In addition, the intervention group had an estimated rate of growth that was triple the control group, indicating the intervention group gained approximately 1.6 points over each assessment of Vocabulary/Oral Language. The increased overall score and rate of growth on the Vocabulary/Oral Language outcome indicate that children in the intervention group were able to more accurately label images and provide relevant details about the object when compared to the control group. These skills demonstrate increased mastery of oral language, which has been shown to enhance

both receptive and expressive communication skills and is related to later reading comprehension abilities (Storch & Whitehurst, 2002).

These findings were not expected given that the intervention program did not directly target development of this skill. Children's abilities in the intervention group may have improved in this early literacy skill area due to exposure to more words through the letter naming activities and conversations with their parents. For example, when going through activities, children were exposed to less common words such as "escalator", "ape", and "X-rays" in order to teach letter names. It is possible that parents may have discussed what the objects are or engaged in conversations around the pictures and words within the lesson plans. Children may have also been conversing more with their parents in general through the lessons, resulting in development of a larger expressive vocabulary.

When examining Comprehension outcomes, children in the intervention group had a statistically significant and higher level of performance and rate of growth compared to the control group. The average child in the control group performed very similarly to children in the PELI pilot sample, with the larger sample averaging 10.2 points and this smaller sample also yielding an average score of 10.2 (Kaminski, 2012). This indicates that children in the control group achieved scores consistent with a larger sample of children who did not receive any intervention throughout the school year. In contrast, the average child in the intervention group achieved a score that was approximately 4 points higher at the end of the intervention and achieved almost three times the rate of growth. The increase in Comprehension abilities for the intervention group could be due to the same interactions related to the increase in Vocabulary/Oral

Language skills. The learning activities included in the early literacy program may have resulted in increased conversations between children and parents. In addition, if parents also engaged more frequently in other activities, such as shared reading, this change within the home could lead to having a larger vocabulary, practice with predicting outcomes and story-telling, and/or improve memory for details. The PELI Comprehension questions included questions focusing on understanding vocabulary, making inferences, and retaining details of stories. If children were practicing these skills at home, such as through shared reading, they were exposed to more learning opportunities would likely perform better on the PELI Comprehension subscale.

Given the consistent improvement across these early literacy skills, it appears that the intervention program is related to overall early literacy skills development. The improvements in skills not specifically taught to children indicates that the early literacy skills program may serve as a catalyst for changing learning activities in the homes of parents who implement the intervention with integrity, which results in more widespread gains for children who receive the intervention program. It should be noted that upon conclusion of this study, parents in the control group were offered the opportunity to receive the early literacy skill program and training on how to complete the activities. Of the thirteen families in the control group, eleven parent-child dyads requested and received the training for the early literacy skill program. At the conclusion of the intervention, all parent-child dyads in the intervention group received the control group materials focused on reading in the home.

Variety of Activities. The variety of activities examined whether parents in the intervention group increased the repertoire of activities they engaged in with their

children. An increasing trend was observed in the intervention group, moving from approximately 10 activities at Time 1 to approximately 11 activities at Time 3. In contrast, very little difference was observed in the control group from Time 1, with slightly more than 10, to Time 3 with an average of approximately 10. However, these differences were not found to be statistically significant when placed in a multilevel model.

The non-significant findings regarding the variety of activities in which parents engaged indicates that parents did not report an increase in the types of activities they completed. The intervention program does not appear to significantly increase parents' engagement in new strategies to teach their children early academic skills. However, the rate of growth for the intervention group was positive, indicating some increases in the variety of activities, compared to the negative rate of growth reported by parents in the control group. If these two rates of growth continue over time, it is possible that the difference between the two groups could reach statistical significance. Future research should explore the relationship between completing the intervention and the variety of activities parents engage in over longer intervals of time. An additional research direction would be to examine other factors, such as parent self-efficacy, which may be related to parents engaging in new early learning activities (Hoover-Dempsey & Sandler, 1995).

Another factor that may have influenced the variety of activities was the level of enjoyment the child had with the early learning activities at home. If the child enjoyed engaging in the specific activities the parent was offering, there may not have been a need to change the set of activities being completed at home over the 12 week period. Instead, a longer follow-up period may show greater changes in the types of activities parents

were completing at home, as the child tired of specific activities and desired different ones.

A final possible explanation for the non-significant findings was that although the list of activities within the questionnaire was designed to cue parents to think of activities they were completing, the individual items were phrased in a way that asked for specific skills instead of assessing the different ways a skill could be taught. For example, parents reported whether or not they completed any activity with their child focused on writing the child's name or other words. This assesses a skill, but not the different methods a parent could use to accomplish teaching the skill. A parent can teach their child how to write their name by having them write it in chalk on the sidewalk, through coloring, on the bathroom wall in bubbles, or by recognizing the child's name in different places. Although all of these activities are different, these activities would all be included under the one category in the questionnaire- "printing name/words." Differences in the methods of teaching the same skill by changing how the skill is practiced were not captured by the questionnaire. By not assessing this change, important information about the variety of activities parents engage in may have been missed.

Frequency of Activities. In addition to examining the variety of activities parents reported, the frequency of engagement in all early learning activities within the home also was examined. The average frequency of activities reported by parents in both groups was very similar initially with approximately 55 activities per week for the intervention group and approximately 54 activities for the control group. However, by the end of the intervention period, children in the intervention group were completing approximately 69 activities with their parents while children in the control group were

reported to complete approximately 42 activities during the previous week. Examining this relationship through multilevel modeling, the effect of the intervention yielded a statistically significant difference, with an estimated increase over the control group of 28 activities reported within the previous week. Parent report for children in the control group indicated a decrease of approximately 6 activities over each assessment period whereas parents in the intervention group reported an increase of approximately 7 activities at each assessment point. Put another way, parents in the intervention group added one more activity per day in a week at each assessment point while parents in the control group decreased their engagement in activities at each assessment point.

The decline in frequency of engagement in activities reported by the control group may have been due to the approaching summer, where parents are engaged in other activities surrounding the end of school (i.e., class parties, school performances, etc.) and may have had less time available to complete learning-centered activities. In addition, the control group families did not have a formal phone call each week to remind them to continue their child's learning at home. In contrast, parents in the intervention group had a consistent reminder to complete some form of learning activity at home (i.e., lesson plans, weekly phone calls) and the reminders may have provided a continued focus on being involved in their child's learning.

Although parents in the intervention group were not interviewed as they were in the pilot study conducted in 2009, an additional explanation from the pilot study could also be relevant to these findings. The frequency of activities may have increased due to the children initiating requests to engage with their parents more often. Parents in the pilot study reported that their children regularly asked to "play" the intervention activities

and frequently brought the intervention binder to their parent to work on activities. All parents reported redirecting the child by selecting a different activity to complete on most occasions. In the current study, children may have engaged in similar behaviors and made requests to complete learning activities, and these changes within the home may have resulted in increases in the frequency of early learning activities occurring in the home. However, no specific data were collected to verify the children's behaviors.

Intervention Acceptability. Intervention acceptability data was collected through the Intervention Rating Profile-13 (IRP-13). The ratings by both groups of parents indicated that the materials provided within the home were perceived as acceptable. The difference between average ratings was small, amounting to less than three points. The non-significant difference supports the hypothesis that parents perceived both interventions to be equally acceptable for use in their home, with parents responding with general agreement to all questions regarding the materials they received. An analysis of the items within the IRP-13 revealed that most parents in both groups "strongly agreed" with many items supporting the use of either set of materials (control or intervention program) within their home, the positive effects for their child, and recommending using the strategies to other parents.

The consistent finding between this study and the pilot study regarding high ratings of acceptability for the early literacy skill program is promising. In the pilot study, the average acceptability rating from six parents was 74 out of a possible 78. With the larger sample of parents within this study, high acceptability ratings were still found and parents would recommend the early literacy skill program to others. However, ratings in both studies may be skewed from the general population because parents had to agree

to participate and were informed about the nature of their participation through seeking informed consent. It is likely that parents who would not find this type of intervention acceptable would not volunteer to participate in a research study.

Consistent with results from the pilot study in 2009, parents indicated lower agreement or disagreement with Question 5 stating, "My child's early reading skills were behind enough to warrant use of this intervention." Although progress is shared with parents regarding their child's developmental milestones and some academic skills (i.e., colors, numbers), parents may not be receiving feedback on their children's progress in early literacy skill development or print knowledge. Parents did not seem aware that their child should show emerging competence on these critical early literacy skills in preschool. Instead, parents may have discovered that their child was having difficulty for the first time in kindergarten, potentially resulting in a negative perception upon entering school. Providing parents with knowledge about the critical early literacy skills and how these can be developed during preschool may help parents become better informed regarding the typical expectations for literacy between the ages of 3 and 5 years old.

Intervention Integrity. The integrity of the early literacy skill program was assessed through completion of lesson plans and one direct observation of each parent completing a single lesson. The relationship between these two methods of assessing integrity was very strong. The intervention integrity across all thirteen families was high, with a mean of approximately 85%. This level of adherence to protocols is slightly higher than other similar types of research studies where children were taught early literacy skills. For example, a parent-directed intervention for kindergarten students with a family history of dyslexia reported an intervention integrity level of 66% across their

sample (van Otterloo, ven der Leij, & Veldkamp, 2006). Two studies examining reading fluency reported slightly higher intervention integrity levels than those found in this study. Average integrity rates of 95%-97% across parents were found in two studies working with children in early elementary school (Casey & Williamson, 2011; Resetar, Noell, & Pellegrin, 2006). The higher rates of integrity within those studies compared to the rates within the current study may be due to the fact that other studies focused on only one teaching strategy and consisted of shorter intervention period. Additionally, the prior studies required parents to complete the intervention with 100% accuracy prior to attempting it independently and used samples consisting of older children (i.e., first and second grade). Children who are older are less likely to have behavioral concerns and have more experience with the expectation to maintain attention and work on academic tasks due to their enrollment in school. Given these differences and the similar findings in this study to previous research, it does appear that the early literacy skill development intervention provides adequate parent training and continued support to assist parents with implementing the program with high levels of integrity.

Examination of the lesson plans and direct observation assessments of intervention integrity within this study indicated that not all parents implemented the intervention with equal levels of integrity. Although ten parents completed the intervention with high levels of integrity (90% or more), three parents had significantly lower levels of intervention integrity, ranging from approximately 16%-57% of the lesson plans completed. When compared to the pilot study, the integrity percentages appear similar, with one of the seven parents withdrawing from the study and another completing approximately 55% of the lesson plans (Sundman, 2009). Although the

majority of parents who received the early literacy skills program did implement it with integrity, assessing why specific parents in both studies had lower adherence to procedures or chose not to complete the lessons would assist with increasing adherence for all parents, and potentially enhance the effectiveness of the program.

Multilevel modeling was applied to the intervention integrity data to estimate the degree to which integrity influenced child outcomes. The level of integrity produced non-significant to minimal effects on all four child outcome assessments. The lack of statistically significant findings could be due to the smaller sample size of the multilevel models (n=13) or the sporadic scatter of the integrity variable (Stevens, 1990). Due to the statistical analyses of intervention integrity varying between the current study and the pilot study, direct comparisons cannot be made.

Limitations

There are several limitations that need to be considered when interpreting and extending the results of this study. First, parents volunteered to have their children screened for inclusion in the research study. Although the parents did not have significant differences in demographics from the available data on parents of Head Start in the county, there is a possibility that parents who elected to participate in the study may have differed from those who chose not to participate. These differences could have been in the desire for parental involvement, willingness to engage in reading activities at home, or feelings toward enrolling in a research study. It is possible that some of these characteristics contributed to the results of the intervention. Therefore, results should be extended only to situations where parents elect to complete the early literacy intervention program.

Implementation bias may have played a role in the effects of the intervention program. As the number of parents increases, there is a higher likelihood of each parent completing the intervention with some slight differences from the original training and from other parents (Glass & Hopkins, 1996). This results in more variation in implementation, making it more likely that parents did not complete the intervention with the same level of integrity. Multiple components were used during training and implementation of the intervention to counteract variability in implementation, such as (1) training parents in small groups, (2) providing videotaped modeling, (3) supporting parents through feedback and the answering of questions by the study coordinator, (4) calculating intervention integrity of each lesson, and (5) conducting a direct observation of one lesson. However, these measures cannot fully account for all variability in parents' adherence to the scripted lesson plans.

This study relied on parent self-report for the completion of lesson plans, and the frequency and types of early learning activities that were completed in the home. Parent self-report for activities may not have aligned with the actions that truly occurred within the home. In addition, social desirability may have impacted responses, such that parents may have felt the need to report engaging in more activities than what actually occurred at home. Social desirability may have held less of a role in intervention integrity since parents were also directly observed completing a lesson and the relationship between lesson plan completion and direct observation was strong and positive.

An additional limitation was that parents were not surveyed on other potential programs in which they may have been enrolled. Although parents reported the types and frequency of early learning activities engaged in at home, other programs that parents

may have been involved with were not controlled for in this study. Due to random assignment, it may be that enrollment in other programs, if any, was equivalent across parents in the control and intervention group. It is possible that completing this early literacy intervention may have encouraged parents to utilize strategies and materials provided by additional early learning programs or increased the parents' confidence to do so.

A limitation within this study was that the early literacy intervention program targeted two early literacy skills within each lesson plan (phonological awareness and letter naming). Due to this, it is not possible to discern the impact of each learning strategy parents completed on individual skills, since the activities took place over the same period of time. In addition, the study design does not allow for drawing conclusions about if the delivery of the two strategies at the same time results in greater outcomes than if the activities were completed separately.

Finally, generalization of these results to other preschool populations should be done with caution. The families enrolled within the research study had similar socioeconomic backgrounds, lived within the same geographic region, and enrolled primarily female children. Although children were matched based on gender and initial early literacy skill scores, having a different sample with more male children may result in different findings for children's acquisition of skills. In addition, children and families who qualify for services through Head Start have been documented to possess deficits in early learning skills (Zill et al., 2003) when compared to children from higher socioeconomic backgrounds. Therefore, the intervention program may not produce the

same effects if used with a sample of families from a middle or high socioeconomic background.

Implications

The early literacy skill intervention program employed in this study represents one of few interventions presented in the empirical literature designed to increase parental involvement at home with preschool aged children. In addition, it is one of few parent-directed interventions documented that focuses parental efforts on essential skills related to success in attaining early literacy skills (NELP, 2008). Early childhood professionals can use this program within preschools as a preventative measure to bolster key early literacy skills prior to kindergarten entry, ensuring children have the pre-requisite skills needed for success. Encouraging all parents to use an intervention program like this has the potential to prevent the "Matthew Effect" (Stanovich, 1986), where children will fall further behind their peers and require intensive interventions later to narrow the gap between their reading performance and the expected level of reading achievement.

The early literacy skill intervention program may also be used as a targeted intervention for children who are already experiencing deficits. Initial skill levels of some children were very low, particularly when examining phonological awareness abilities. By providing this intervention program to children with documented needs in letter naming or phonological awareness skills, children are likely to improve their skills in both areas. The early literacy skill program has the potential to fill a need within the literature because few specific intervention programs are home-based, use resources within the child's life, and target key skills for early literacy development.

Intervention programs that are home-based and utilize parents as the implementers are both effective and practical for children who may be experiencing delays in skill development. The adult in charge of supervising the child before or after preschool could be trained to complete early learning-based activities. Time demands remained low for parents, with a one-time training that resulted in high levels of intervention integrity for most parents. Parents' time demands were also respected by providing brief and convenient prompts through the use of phone calls to remind parents to complete lessons and answer questions. The respect for time demands may be particularly important for homes with a single caregiver. The intervention group consisted of nine families reportedly lead by single parents. Even within these homes where time may have been less available to work with their child, the early literacy skills program was implemented with integrity, perceived as acceptable, and yielded positive child outcomes.

In addition, providing a structured learning activity within the home may enhance engagement between the parent and child around numerous learning activities. Promoting learning both at home and through preschool is more likely to yield gains in learning for children than if learning is only confined to the school environment. The early literacy skill intervention also provides parents with strategies they can apply to other skills they need to teach their children.

Using intervention programs such as the one in this study in a voluntary manner, as opposed to making it mandatory, may be the most effective way to engage parents. Despite minimal time requirements and availability of resources to answer questions, some parents still did not complete the early literacy intervention activities. Therefore,

providing an intervention program like the one within this study may promote involvement in parents who are open to engaging in their child's learning. However, offering the program on a voluntary basis will also conserve resources by not providing materials, training, and feedback to families who are not likely to complete the activities. The lack of engagement by some families may also be addressed by having the program introduced and endorsed by preschool staff instead of by individuals, or in this case, researchers outside of the agency. Some parents may have been more invested if the Head Start staff whom they knew and trusted were the contact persons regarding completing the intervention. Teachers and staff within the Head Start could have also had more regular contact with parents, both through face-to-face meetings and notes sent home, and provided feedback to parents regarding their child's progress in skill development and the parent's adherence to intervention procedures.

The use of regular screening of critical early literacy skills within Head Start and sharing these results with parents may also assist parents in understanding their child's early literacy skills and assist in targeting areas in need of development. Although Head Start conducts behavioral, health, and developmental screenings on all children, there is not a current policy on fully screening early learning skills expected for kindergarten or a measure suggested to do so (U.S. Department of Health and Human Services, 2003). With higher academic expectations of children upon kindergarten entry than in previous decades, specific screenings of emerging academic skills in preschool could identify small deficits early on and allow for the implementation of interventions to prevent students from falling further behind (Kazak, 2006). In addition, results of academic screenings could be shared with parents. Informing a parent of where his or her child

needs further skill development could provide guidance and encourage parents to become involved in developing their child's readiness for formal schooling. Throughout the Head Start centers, most parents indicated their child was not behind enough to warrant using the intervention or control group materials. However, many children were not showing mastery of pre-kindergarten levels of skills for kindergarten readiness. Inclusion of regular academic screenings within the preschool setting may assist parents and teachers in understanding where a child's preschool academic skills are currently and also provide skills to target for further development.

Future Directions for Research

This study provides additional empirical support for the effects of this intervention program on early literacy skill development. Future research should focus on extending the generalizability of the program by utilizing a larger, more geographically diverse sample of Head Start preschools. In addition, the effects of the program could be examined with children who are enrolled in other preschool settings such as private preschools, voluntary preschools, or preschools that provide services to children with developmental delays

This study was not designed to examine the impact of the early literacy teaching strategies for letter naming and phonological awareness separately, making decisions about the effectiveness of each component impossible to conclude. Future research could utilize a larger sample and explore other research design methods to determine the effectiveness of these separate components and whether their use in combination yields enhanced effects.

An additional area for future investigation is whether the program would be more effective if matched more specifically to children's needed skill areas. For example, if a child has less developed skills in phonological awareness, would providing more practice in phonological awareness activities and reducing the letter naming focus to only letters the child does not know result in different outcomes? This knowledge would allow for more efficient delivery of the intervention within the home and may lessen the time needed to engage in activities or shorten the number of weeks needed to complete the early literacy skill program.

Further investigation is warranted to explore the findings that children who received the early literacy skills intervention also evidenced improvements in vocabulary/oral language and comprehension skills. Future research efforts should examine how these improvements were attained and whether it was due to exposure of the early literacy skill program or due to the other activities that parents engaged in outside of the intervention program.

Due to the presence of statistically significant findings of changes in frequency of engagement in early learning activities, future research could examine how this relationship is mediated or moderated and examine factors likely to influence parents' engagement. For example, the intervention program may have increased parents' self-efficacy for assisting their children with learning activities, and changes in self-efficacy may influence how often parents interact with children around learning. Assessing parent perceptions and feelings of efficacy may further explain how the early literacy skill program can produce changes in skills not directly taught through the lesson plans.

Conclusion

The impact of a parent-implemented, home-based early literacy program was investigated. A total of 26 Head Start families remained in the study through the entire intervention period, with 13 families in each group. Examinations of 20 children's performance on Letter Naming, Phonological Awareness, Vocabulary/Oral Language, and Comprehension outcomes revealed that the intervention group outperformed the control group in both level of performance and rate of growth. Changes within the home environment for the intervention group included having parents engage in additional early learning activities with their child throughout the week. Ratings of intervention acceptability by parents were high and the majority of parents were able to implement the home-based intervention with integrity. The results of this study support the effectiveness of this early literacy skill intervention program and provide evidence for utilizing parental involvement in education at home to enhance early literacy skill development.

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Appendices

Appendix A: Sample Lesson Plan
Lesson Plan- 15

Parent's Name:_____ Child's Name:_____

Date:_____ Begin Time:_____ End Time:_____

Letter Check:

A a	___	F f	___	K k	___	P p	___	U u	___	Z z	___
B b	___	G g	___	L l	___	Q q	___	V v	___		
C c	___	H h	___	M m	___	R r	___	W w	___		
D d	___	I i	___	N n	___	S s	___	X x	___		
E e	___	J j	___	O o	___	T t	___	Y y	___		

Do you have a mark for each letter? **Yes** **No**

New Letter for today:
B b Sentence for letter: A **bee** goes buzz.
Teaching B b:
___ Hold up the B b card and, next to it, the picture of a bee.
___ Say: *"Here are two letters, and here is a picture. Every time you see these letters and this picture you are to say out loud, 'A bee goes buzz.'"*

- *"What are you going to say when you see these letters and this picture?"*
    - Did your child repeat the sentence correctly? **Yes No**
    - Did you praise your child's efforts? **Yes No**

- Say: *"The name of this letter is in the sentence. The name of this letter is B. What is the name of this letter?"*
    - Did your child say the name of the letter correctly? **Yes No**

- Say: *"Ok, here is the picture and here are the letters."* (point to each one) *"Every time you see this picture or these letters I want you to say the sentence 'A bee goes buzz' and B. Do that for me."*
    - Did your child say the sentence and letter name correctly? **Yes No**
    - Did you praise your child's efforts? **Yes No**

- Say: *"Now we are going to practice some more. First I am going to say it with you then I want you to do it all by yourself."*

  ***Repeat each step until your child has responded correctly**
  ___ 1. Hold up both cards and say the sentence and letter name with your child
  ___ 2. Hold up both cards and whisper the words while your child says it
  (Take away the picture)
  ___ 3. Have your child whisper the sentence and say the letter name.
  ___ 4. Have you child say the letter name.
    - Did your child correctly complete all steps? **Yes No**

Letter Review
The three letters from previous sessions should be **H h, U u,** and **C c**.

- Hold up the H h card and the picture of a TV with the HBO sign on it. Ask your child, *"Do you remember the saying for this letter? Please tell me it and the name for this letter."*
    - Did your child remember the saying "HBO is on television"? **Yes No**
    - Did your child remember the letter name? **Yes No**
    - Did you give praise or correction as needed? **Yes No**

- Hold up the U u card and the picture of picture of a heart with an arrow pointing to a child. Ask your child, *"Do you remember the saying for this letter? Please tell me it and the name for this letter."*
    - Did your child remember the saying "I love you"? **Yes No**
    - Did your child remember the letter name? **Yes No**
    - Did you give praise or correction as needed? **Yes No**

- Hold up the C c card and the picture of picture of two eyes. Ask your child, *"Do you remember the saying for this letter? Please tell me it and the name for this letter."*
    - Did your child remember the saying "I can see you"? **Yes No**
    - Did your child remember the letter name? **Yes No**
    - Did you give praise or correction as needed? **Yes No**

Sound Practice

- Ask "Do **boy** and **shoe** start with the same sound?" (correct answer is NO)
    - Did your child say NO? **Yes No**
    - **Did you provide praise or correction as needed? Yes No**

- Ask "Do **bed** and **back** start with the same sound?"(correct answer is YES)
    - Did your child say YES? **Yes No**
    - **Did you provide praise or correction as needed? Yes No**

- Tell me the first sound in the word **toy**.
    - My child said _____
    - Did your child provide a correct sound? **Yes No**
    - **Did you provide praise or correction as needed? Yes No**

- Tell me the first sound in the word **wood**.
    - My child said _____
    - Did your child provide a correct sound? **Yes No**
    - **Did you provide praise or correction as needed? Yes No**

- Tell me the first sound in the word **kite**.
    - My child said _____
    - Did your child provide a correct sound? **Yes No**
    - **Did you provide praise or correction as needed? Yes No**

How do you think the session was? 1 2 3 4 5
Bad OK Great!

Why?_____
_____

Any concerns or problems? _____
_____

If there are any questions, please contact Ashley at [redacted] or at [redacted]@mail.usf.edu

Appendix B: Control Group Materials

Reading at Home with your Child

This packet contains information that will help you when reading to your child at home. Please read through the packet and use what you find to be the most helpful. If you have any questions about this information, please contact Ashley at [redacted] or [redacted]@mail.usf.edu.

This packet contains:

- A checklist to help you rate the reading environment at home
- Reading milestones for preschool
- Reading tips to increase the different ways you and your child read together
- Lists of books a child in preschool might like

The materials in this packet are an adaptation of the materials from the nationally recognized Reach Out and Read program which provides reading guidance during visits with pediatricians.

Get Ready to Read! www.GetReadytoRead.org

Home Literacy Environment Checklist

Is your home literacy-friendly?

You are your child's first teacher. Your home is where your child will get his or her first experiences with books and reading.

Look around your home and think about what you do with your child. If the statement on the checklist is true, place a check in the "true" column. If the statement is false, place a check in the "false" column. When you are finished, count up the number of checks in the true column and find that number on the chart at the end of the checklist. Use the results as a guideline to see what you can do for your child.

What my child has...	TRUE	FALSE
My child has at least one alphabet book (e.g., Dr. Seuss's *ABC* book).	☐	☐
My child has magnetized alphabet letters to play with.	☐	☐
My child has crayons and pencils readily available for writing and drawing.	☐	☐
My child has paper readily available for writing and drawing.	☐	☐
My child has a table or surface readily available for writing or drawing.	☐	☐
My child has at least one rhyme book (e.g., Joseph Slate's *Miss Bindergarten Gets Ready for Kindergarten*).	☐	☐
My child has more than one rhyme book.	☐	☐
My child has at least 10 picture books.	☐	☐
My child has at least 20 picture books.	☐	☐
My child has at least 50 picture books.	☐	☐
My child plays beginning reading and alphabet games on a computer (e.g., *Reader Rabbit* or *Bailey's Book House*).	☐	☐
My child has materials and games to help learn the alphabet.	☐	☐

What I or another adult do...	TRUE	FALSE
I or another adult in the house read a picture book with my child at least once a week.	☐	☐
I or another adult in the house read a picture book with my child at least four times a week.	☐	☐
I or another adult in the house teach new words to my child at least once a week.	☐	☐
I or another adult in the house teach new words to my child nearly every day.	☐	☐
I or another adult in the house have a detailed and informative conversation with my child at least once a week. (e.g., "How do you think ice cream is made?").	☐	☐
I or another adult in the house have a detailed and informative conversation with my child nearly every day.	☐	☐
I or another adult in the house help my child learn nursery rhymes.	☐	☐
I or another adult in the house encourage my child to tell me what he or she wants using complete sentences.	☐	☐
I or another adult in the house take my child to the library or a bookstore at least once every two months.	☐	☐

What my child sees me or another adult doing...	TRUE	FALSE
My child sees me or another adult in the house reading books, magazines or the newspaper at least once a week.	☐	☐
My child sees me or another adult in the house reading books, magazines or the newspaper nearly every day.	☐	☐

Appendix B (Continued)

What I am...	TRUE	FALSE
I am a good reader.	☐	☐
I have a large vocabulary.	☐	☐
I began to read picture books with my child before he or she was a year old.	☐	☐
I enjoy reading picture books with my child.	☐	☐
I expect that my child will work to his or her potential in school.	☐	☐

Now or in the past, I or another adult encourage or help my child...	TRUE	FALSE
I or another adult in the house encourage my child to watch beginning reading shows on TV or tapes (e.g., Between the Lions on PBS).	☐	☐
I or another adult in the house encourage my child to play with computer games that introduce the alphabet and beginning reading (e.g., *Reader Rabbit*).	☐	☐
I or another adult in the house help my child learn to sing or say the alphabet.	☐	☐
I or another adult in the house help my child learn to name letters of the alphabet.	☐	☐
I or another adult in the house help my child learn to write letters of the alphabet.	☐	☐
I or another adult in the house help my child learn to write his or her name.	☐	☐
I or another adult in the house help my child learn to write other people's names.	☐	☐
I or another adult in the house help my child learn how to rhyme.	☐	☐
I or another adult in the house help my child learn the sounds that letters of the alphabet make (e.g., "M makes the mmmm sound").	☐	☐

Count up the number of statements marked TRUE and put that number in the box to the right. See the chart below to find out how literacy-friendly your family child care program is. ☐

30 - 37	Home literacy environment has most of the necessary supportive elements
20 - 29	Home literacy environment has many supportive elements
11 - 19	Home literacy environment has some supportive elements
0 - 10	Home literacy environment needs improvement

If you would like your number to be higher, examine the statements that were not checked as TRUE and see which ones you can incorporate into your routine.

Get Ready to Read! is a project of the National Center for Learning Disabilities. For more information about this program, visit their website www.GetReadytoRead.org.

Milestones for Preschool Children

Milestones are skills that are typically achieved within a specific time period (ages 3-5) that are important for later development. The list below contains some important skills for preschool children related to reading.

- Holds book correctly
- Turns book pages one at a time
- Sits and listens to longer stories
- Retells a familiar story
- Understands what text is
- Moves fingers along text
- "Writes" their name (Attempts to make letters to spell out their name)
- Begins recognizing letters, such as the first letter of their name

Information from Reach Out and Read's Early Literacy Milestones- www.reachoutandread.org

Appendix B (Continued)

Suggestions for Reading with Your Child

Dialogic Reading

Reach Out and Read recommends using the Dialogic Reading approach to read with children when they are young. To do this, parents should use the **PEER** approach. **PEER** stands for:

P	Prompt the child to say something about the book. *"What does a dog say?"*
E	Evaluate the child's response. *"That's right! A dog says woof woof!"*
E	Expand on the child's response *"And a cat says meow!"*
R	Repeats the prompt. *"What does a cow say?"*

To help parents remember the different kinds of prompts, **CROWD** can be used as a reminder. **CROWD** stands for:

C	**Completion prompts**- Child is asked to complete sentences in familiar books *"I do not like Green Eggs and Ham. I do not like them Sam I _____."*
R	**Recall prompts**- The child is asked about what happened in a story that has already been read. *"Did Sam like Green Eggs and Ham?"*
O	**Open-ended prompts about the picture and the story.** *"What is Sam doing in this picture?"*
W	**What, When, Where, and Why prompts.** *"What is Sam holding?"*
D	**Distancing prompts**- The child is asked to relate the book to events or situations in their own life. *"Look at Sam's doggy. Do you have a doggy?"*

*Dialogic Reading is a concept based on the work of Dr. Whitehurst and the Stony Brook Reading and Language Project. Information on this page from Whitehurst, G. (1992), Dialogic Reading: An effective way to read to preschoolers.

Suggestions for Reading with Your Child

Other Suggestions

- **Read together every day**- Reading can happen as part of a bed time routine or at any part of the day you and your child have time together
- **Ask, "What's happening?" when looking at a picture**- Have your child describe what they think is happening before you read the text.
- **Let your child tell the story**- it doesn't matter if their story does not match the text
- **Choose books that tell stories, contain numbers, or the alphabet**
- **Have your child sit close to you or on your lap while reading**
- **Visit the children's room at the library so your child can choose more books**
- **Give everything a name**- Name objects in pictures and ask questions about them
- **Say how much you enjoy reading with your child**- Share with your child that you enjoy your special time with him and her. Tell them that "story time" is the favorite part of your day.
- **Read with fun in your voice**- Give characters different voices and really bring the text to life! Don't be afraid to ham it up!
- **Know when to stop**- If your child loses interest or is not paying attention, put the book away for awhile.
- **Read it again, and again, and … again**- Its perfectly OK to read a book many times.
- **Talk about writing too**- Point out how we read from left to right (and top to bottom). Show your child that words are separated by spaces and have them point out letters or words they may know on a page.
- **Point out print everywhere**- Talk about the words you see in the world around you. Ask your child to find a new word on each outing you all go on together.

Suggestions on this page come from the Reading Rockets Tips for Parents of Preschoolers. For more information, visit www.readingrockets.org.

Book Lists

Preschool Books (3-5 year olds)

- ***Madeline* by Ludwig Bemelmans-** In an old house in Paris that was covered with vines lived 12 little girls in two straight lines" and the best-loved one is Madeline! A favorite of children for decades, the story of an adventurous little girl is perfect for children 4 years and older.
- ***Animal Tracks* written and illustrated by Arthur Dorros-** A guessing game format is used to explore the animal community in the forest. Children can become detectives in their own backyards by using the directions in the book for making track tracings and looking for animals.
- ***A Pocket for Corduroy* by Don Freeman-** Corduroy, a little bear, gets lost at the Laundromat but the happy ending reunites Corduroy with Lisa, the little girl who loves him. A story as heartwarming as the first book, Corduroy, when Lisa and corduroy first meet.
- ***Jamaica Tag-Along* by Juanita Havill-** Jamaica, a little girl upset about not being included in her big brother's basketball game, is building a sand castle when a younger boy asks to play with her. This time Jamaica is the older child-what is she going to choose to do?
- ***Chickens Aren't The Only Ones* by Ruth Heller-** A great first science book, this book is about animals that lay eggs. Set to rhymes with captivating illustrations, children learn about different animals and the kind of eggs each lays.
- ***Amazing Grace* by Mary Hoffman, illustrated by Caroline Binch-** A little girl with a strong imagination, imagines herself right into the lead role in her school's production of "Peter Pan," even though some classmates say Peter Pan can't be a girl, or can't be black. Grace is an unforgettable girl!
- ***The Snowy Day* by Ezra Jack Keats-** A beautiful book about the simple pleasures of playing in the snow and coming home to a warm house. A perfect book to read together on a winter's night.
- ***Leo The Late Bloomer* by Robert Kraus-** Leo, a baby lion, is anxious to grow up and everyone is watching for signs of "blooming".
- ***The Day Jimmy's Boa Ate The Wash* by Trinka Hakes Noble-**Children love this wild tale of a child's class trip to a farm and the unexpected animal found there!
- ***Curious George* by H.A. Rey-** A timeless classic, this story of a mischievous monkey appeals to all children. George, like a small child, is so curious that he sometimes can't help but get into trouble exploring his world. Join George and the Man in the Yellow Hat in his many adventures!
- ***Gregory, The Terrible Eater* by Mitchell Sharmat-** Gregory, a young goat, doesn't like to eat goat food! His parents fuss and fret about Gregory odd eating habits but when his parents come up with a clever plan, it's not long before Gregory is eating shoes and tin cans just like his parents! A humorous look at eating and trying new foods.
- ***Mr. Brown Can Moo! Can You?* by Dr. Seuss-** The remarkable Mr. Brown can make marvelous sounds and you are invited to do so too! Amazing

noises from the pop of a cork to the boom of thunder are just a few of the noises Mr. Brown can do!

- ***Alexander and the Terrible, Horrible, No Good, Very Bad Day* by Judith Viorst-** Any child who has had a frustrating day, when nothing seemed to go right, will understand just how Alexander feels. This humorous story about Alexander's day when everything goes wrong shows children that everyone has hard days.
- ***A Chair for My Mother* by Vera Williams-** A touching and compelling story of a mother and child struggling to overcome a family house fire. The daughter saves up money to buy her mom a chair. This book has received numerous honors and is a great choice for reading aloud.

Multicultural Books

- ***This Is the Way We Go to School* by Edith Baer, illustrated by Steve Bjorkman-** Children all around the world go to school in different ways, on skis in Norway, by train in Kenya, by bicycle in China. The drawings are charming, the rhyming narrative easy to read ("Carlos takes the town in stride/Luz prefers the countryside."). Maps of the world and extra information available at the end of the book for children who want to know where the various scenes are set.
- ***Saturday at the New You* by Barbara E. Barber, illustrated by Anna Rich-** Saturdays are special because it's the day that Shauna helps Momma at her hair salon, The New You. And it's Shauna to the rescue when a problem arises with one of the customers.
- ***The Mud Pony* retold by Caron Lee Cohen, illustrated by Shonto Begay-** In this retelling of a traditional Skidi Pawnee folktale, a young Native American boy longing for a pony makes one out of mud, falls asleep, and dreams his pony is alive. Upon waking, he finds his pony is his spirit guide in life. Beautiful illustrations document the boy's growth into adulthood.
- ***The Legend of The Blue Bonnet* by Tomie De Paola-** A Comanche legend about a little girl's sacrifice and how she is remembered each year when bluebonnet flowers of Texas bloom in the spring.
- ***The Legend of The Indian Paintbrush* by Tomie DePaola-** A captivating retelling of a Great Plains legend. A young Native American Indian artist has a dream vision that is fulfilled as the story unfolds.
- ***Josephine's Imagination: A Tale of Haiti* by Arnold Dobrin-** An atmospheric and delightful story set in the Haitian marketplace. The young daughter of a broom seller, creates dolls by turning several of her mother's brooms into dolls. These are magic dolls and chaos soon follows!
- ***Everybody CooksRice* by Norah Dooley-** As Carrie looks for her brother to fetch him home for supper, she tastes a little of each of her neighbors' delicious meals - Haitian, Vietnamese, Puerto Rican, Indian, and more - and discovers that they all cook with rice. Recipes included!
- ***Li'l Sis and Uncle Willie* by Gwen Everett and Paintings William H. Johnson-** The life story of African American painter William H. Johnson is

illustrated with his paintings from the Smithsonian. This book is an excellent source of African American culture and history.

- ***Anancy and Mr. Dry-Bone* by Fiona French-** Anancy and Mr. Dry-Bone are traditional characters from African and Caribbean folktales. Anancy, a trickster, competes with wealthy Mr. Dry-Bone for Miss Louise's hand in marriage. Who will win her over? This richly-illustrated book is full of suspense and humor.
- ***Family Pictures* written and illustrated by Carmen Lomas Garza-** Warm illustrations and touching descriptions of the author's grandmother's house, a fair in Reynosa, and a birthday party, draw the reader into life in Mexico.
- ***Iktomi and the Boulder* by Paul Goble-** An exciting Plains Indian story about Iktomi, a popular character in Indian folklore, who is making mischief again. Iktomi's foolish ways will intrigue young children!
- ***Joshua's Masai Mask* by Dakari Hru, illustrated by Anna Rich-** After having adventures with a Masai mask given to him by his uncle, Joshua discovers the joy of just being himself.
- ***Mama, Do You Love Me?* by Barbara Joosse-** A beautiful rhyming story with descriptions of Inuit life and arctic animals, this tale of a mother's love appeals to all children.
- ***Zora Hurston and the Chinaberry Tree* by William Miller, illustrated by Cornelius Van Wright and Ying-Hwa Hu-** The true story of author, Zora Neale Hurston, who as a young girl, learned about hope and strength from her mother.
- ***Bread, Bread, Bread* by Ann Morris-** A multicultural tale of the meanings, traditions and uses for bread around the world. Photos highlight a variety of cultures and practices. This is the perfect book for exploring the richness of the world around us!
- ***Abiyoyo* by Pete Seeger, illustrations by Michael Hays-** Pete Seeger's famous South African ballad about a boy and his magician father as they struggle with a giant terrorizing their village. Young readers will enjoy seeing the boy and his father working to defeat the terrible giant.
- ***Dancing Teepees: Poems of American Indian Youth* selected by Virginia Driving Hawk Sneve, art by Stephen Gammel-** This collection of traditional and contemporary Native American poetry, including poems such as an Osage prayer and a Hopi lullaby, will capture the hearts and minds of young readers.
- ***Mufaro's Beautiful Daughters* by John Steptoe-** An African Cinderella story, this tale is guaranteed to captivate readers of all ages. Filled with rich illustrations and strong characters, this is a book to treasure.
- ***Angel Child, Dragon Child* by Michele Maria Surat-** Ut, a young child who recently immigrated from Vietnam, struggles courageously to adjust to her new life and new school as she longs for her mother who had to stay behind in Vietnam.

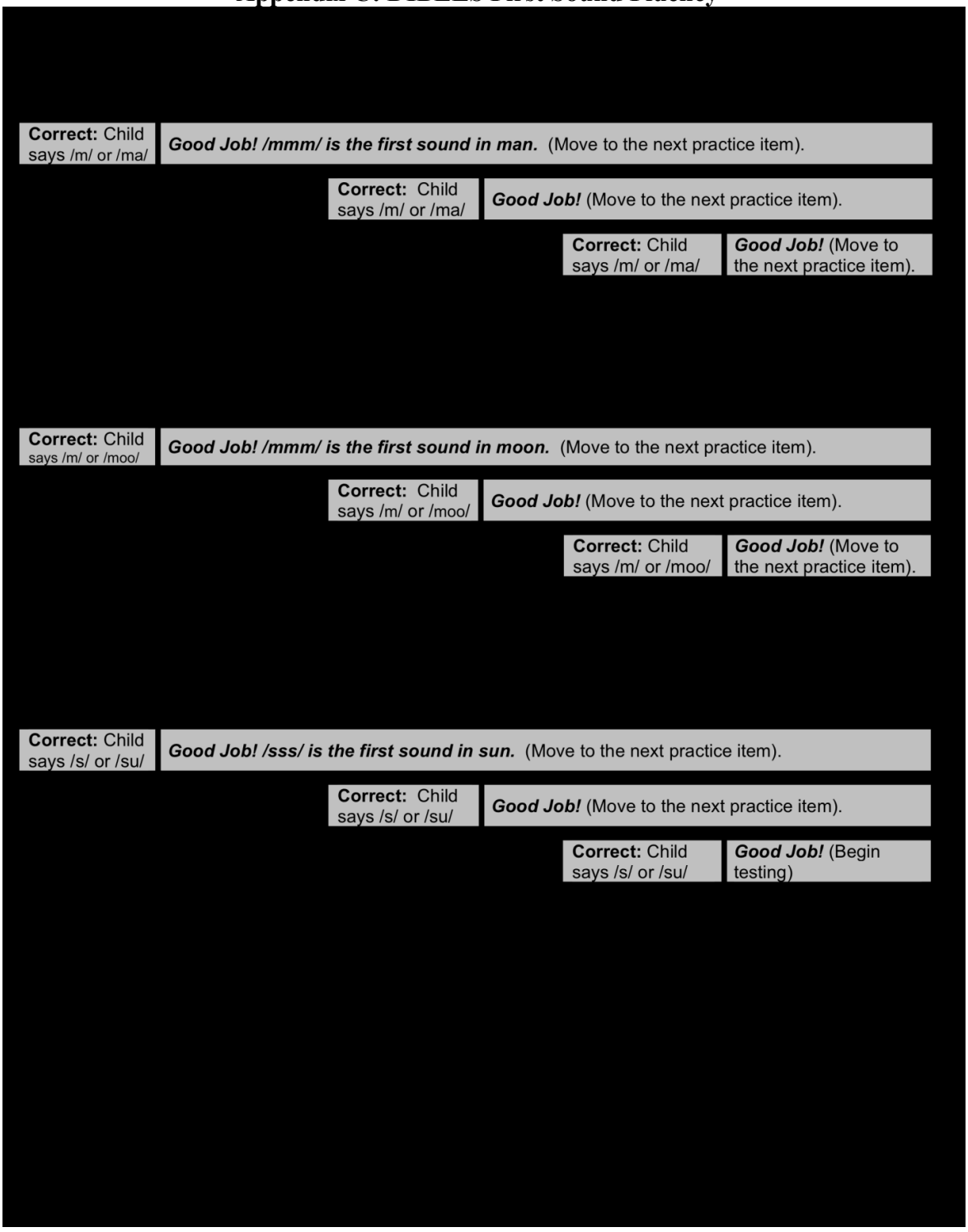
Alphabet Books

- ***Guinea Pig ABC* by Kate Duke-** A troupe of appealing guinea pigs illustrate the alphabet to the delight of readers!
- ***Eating the Alphabet* by Lois Ehlert-** With luscious and lavish illustrations, the author covers the alphabet from apricots to zucchini. There is even a glossary of fruits and vegetables in back for hungry readers to savor!
- ***The Butterfly Alphabet Book* by Jerry Pallotta-** Butterflies flutter on the pages as readers learn the alphabet and discover fascinating facts about butterflies.
- ***The Dinosaur Alphabet Book* by Jerry Pallotta-** It's an A-Z delight of dinosaurs! Learn dinosaur names and facts in this informative alphabet book.
- ***The Icky Bug Alphabet Book* by Jerry Pallotta-** The ickiest looking bugs creep and crawl through the alphabet to the delight of young readers!

Counting Books

- ***Ten, Nine, Eight* by Molly Bang**- This brightly-illustrated book is perfect for bedtime reading. A young girl and her father count down to bedtime using objects in her bedroom.
- ***Fish Eyes* by Lois Ehlert**- This counting book, with its gorgeous tropical fish and deep blue background, is a showstopper! The "see-through" fish eyes will delight children as they learn to count.
- ***With My Brother/Con Mi Hermano* by Eileen Roe**-A young boy describes his life with his older brother and the time they spend together. An enjoyable look at one boy's loving relationship with an older sibling.
- ***Feast for 10* by Cathryn Falwell**- A lively counting book about a family shopping and preparing a meal together. Rhyming sentences that count up to 10 ("five empty cans/six pots and pans") are a delight to recite and the colorful scenes will appeal to everyone.
- ***Joe Can Count* by Jan Ormerod**- A little boy counts animals, one to 10, ending up with his very own puppy. A delightful counting book for young children.
- ***Mouse Count* by Ellen Stoll Walsh**-Clever mice elude a snake in this colorful counting book that counts to 10 and then, as the mice escape, counts down from 10 to 0.

Appendix C: DIBELS First Sound Fluency



Appendix C (Continued)

1. ramp	/r/	/ra/	0
3. black	/b/	/bl/, /bla/	0
5. farm	/f/	/far/	0
7. hole	/h/	/hoe/	0
9. goat	/g/	/goe/	0
11. sled	/s/	/sl/, /sle/	0
13. glee	/g/	/gl/	0
15. cliff	/k/	/kl/, /kli/	0
17. cleaned	/k/	/kl/, /klea/	0
19. raise	/r/	/rai/	0
21. stick	/s/	/st/, /sti/	0
23. geese	/g/	/gee/	0
25. cracked	/k/	/kr/, /kra/	0
27. tripped	/pt	/tr/, /tri/	0
29. bowl	/b/	/boe/	0

Appendix D: DIBELS Letter Naming Fluency

Letter Naming Fluency Directions:

- ***I am going to show you some letters. I want you to point to and say its name.*** (Place sheet of letters in front of child)
- ***Start here.*** (Point to the first letter at the top of the page). ***Go this way***(Sweep finger across first two rows of letters) ***and say each letter name. Put your finger under the first letter. Ready… Begin***.

Start timer and record responses for one minute. After one minute place a bracket after the last letter (**]**).

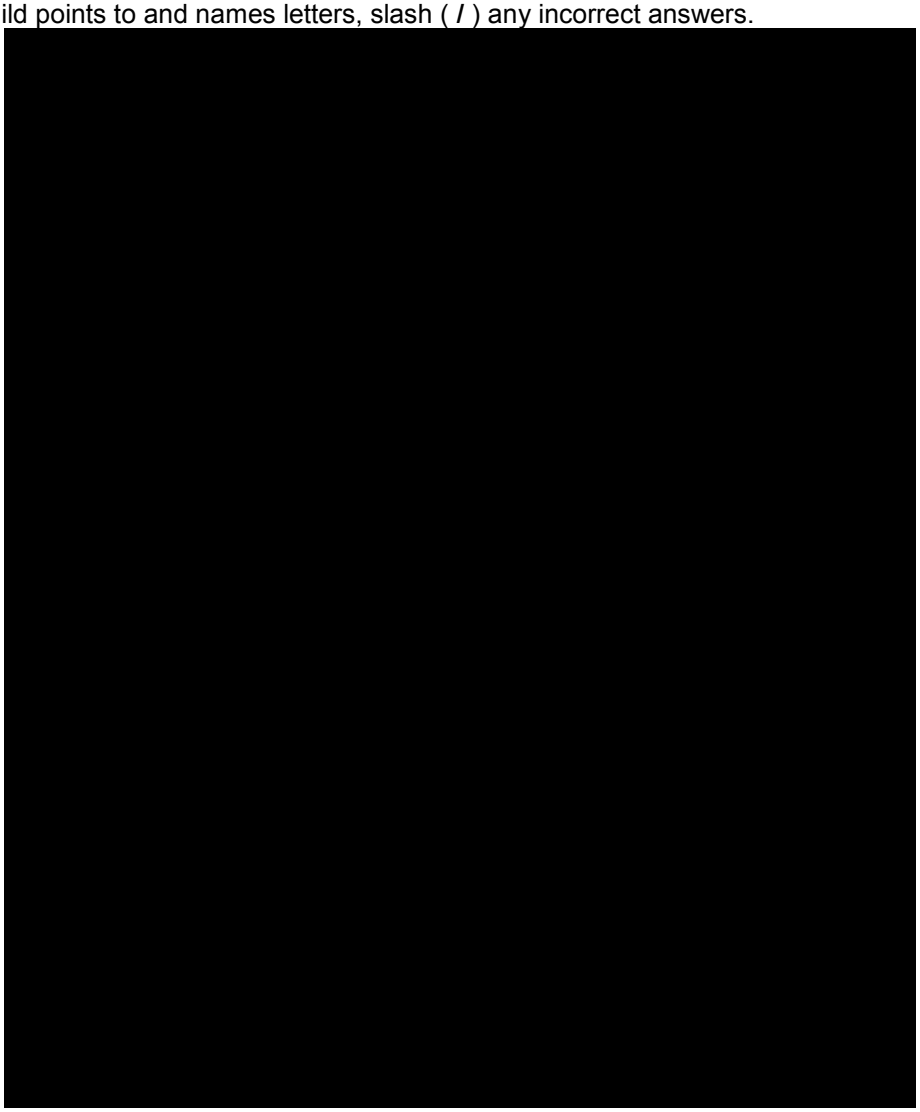
- If a child pauses on a letter for more than 3 seconds, mark it as incorrect and say the correct letter name. Then, point to the next letter.

Reminders

- One time (child skips around page)- **Go this way** (sweep finger).
- One time- **Say the letter name, not its sound.**
- One time (if 4+ letters are skipped)- **Try to say each letter name.**

Scoring

- As a child points to and names letters, slash (*/*) any incorrect answers.



Appendix E: Sample PELI Record Sheet

Child's ID: _____ Examiner: _____ Date: _____

Alphabet Knowledge

Circle letters correctly named in English. Underline letters correctly named in Spanish. Slash letters named incorrectly.

B	L	C	Y	E	X
T	Z	Q	D	R	G
J	H	M	V	N	I
P	A	K	F	W	O
U	S				

Total Letters Named: _____

u	a	f	z	s	h
o	v	w	c	b	m
p	e	d	y	k	g
r	j	q	t	l	i
x	n				

Total Letters Named: _____

Total Score: Alphabet Knowledge: _____

Phonemic Awareness

		2 pt.	1 pt.	0 pt.
PA1.	scarecrow	/s/	/sc/, /scare/	0
PA2.	bluebird	/b/	/bl/, /blue/	0
PA3.	farmer	/f/	/far/, /farm/	0
PA4.	cabbage	/c/	/ca/, /cab/	0
PA5.	jacket	/j/	/ja/, /jack/	0

PA 1 Score: _____

PA6.	pig	horse	cow	0	1
PA7.	apple tree	river	flowers	0	1
PA8.	cat	rabbit	sheep	0	1
PA9.	house	field	corn	0	1
PA10.	girl	boy	chicken	0	1

PA 2 Score: _____

Total Score: Phonemic Awareness: _____

Comprehension

(I=incorrect PC=partially correct C=correct)	Score I	PC	C
Comprehension 1. Inference and Prediction			
C1. What is book about?	0	1	2
C2. How does Farmer Jane feel?	0	1	2
C3. What will Farmer Jane do?	0	1	2
C4. Why is Farmer Jane happy?	0	1	2

Comprehension 1 Total: _____

Comprehension 2. Recollection			
C5. What was the story about?	0	1	2
C6. Why did Farmer Jane go to barn?	0	1	2
C7. What she do when no horse?	0	1	2
C8. Where did she find horse?	0	1	2
C9. What was horse doing?	0	1	2

Comprehension 2 Total: _____

Total Score: Comprehension Section: _____

Vocabulary/Oral Language

V/OL 1. Name pictures

Circle pictures correctly named (1 point). Underline related.

horse sun barn

tractor fence shovel pig

lake/river/pond cow wheelbarrow

V/OL 1 Score: _____

V/OL 2. Tell about pictures

Write word.

_____ 0 1 2 3 4

_____ 0 1 2 3 4

_____ 0 1 2 3 4

V/OL 2 Score: _____

V/OL 3. Retell story

Circle number for each key element.

1 2 3 4 5 6 7 8 9 10

V/OL 3 Score: _____

Total Score: V/OL: _____

Overall quality of response: 0 1 2 3 4 Articulation: 0 1 2 3

On The Farm:

Quality of Response: 0 = no verbal responses; 1 = single word responses; 2 = brief phrases; 3 = complete sentences or extended utterances with grammatical or syntax errors; 4 = grammatically correct sentences.

Articulation: 0 = unintelligible; 1 = numerous articulation errors; very hard to understand; 2 = some articulation errors but understandable; 3 = good articulation

Appendix F: Home Activities Questionnaire

Questionnaire of Home Activities

*This survey asks questions about the types of activities that occur in your home and the number of times each occurs. Answer each of the following questions based upon the **past week** within your home. Please be as accurate as possible when responding to questions.*

Frequency of Shared Reading

How often have you read to your child in the past week?

At bedtime:

___never ___once ___2 ___3 ___4 ___5 ___6 ___7 ___more, please estimate:____

At other times of the day:

___never ___once ___2 ___3 ___4 ___5 ___6 ___7 ___more, please estimate:____

Child Requests

During the past week, how often has your child asked to be read to? Choose a number below to estimate.

Never	Seldom	Sometimes	Often	Very Often
1	2	3	4	5

During the past week, how often has your child asked to do other educational activities with you? Choose a number below to estimate.

Never	Seldom	Sometimes	Often	Very Often
1	2	3	4	5

Children's Books

Please estimate the number of children's books currently in your home:

___none___1-10___11-20 ___21-30___31-40___more, please estimate: _____

Other Activities

During the past week, how many times have you engaged in the following activities with your child:

NOTE: Do not count activities completed as part of the lesson plans

Printing name/words	0	1	2	3	4	5	6	7	8	More: ___
Learning letter names	0	1	2	3	4	5	6	7	8	More: ___
Learning letter sounds	0	1	2	3	4	5	6	7	8	More: ___
Reciting the alphabet	0	1	2	3	4	5	6	7	8	More: ___
Rhyming words	0	1	2	3	4	5	6	7	8	More: ___
Playing word games (example: I Spy)	0	1	2	3	4	5	6	7	8	More: ___
Naming objects/actions	0	1	2	3	4	5	6	7	8	More: ___
Learning numbers	0	1	2	3	4	5	6	7	8	More: ___
Counting objects	0	1	2	3	4	5	6	7	8	More: ___
Learning games (examples: Candy Land, computer games) Please list name of game(s): _____	0	1	2	3	4	5	6	7	8	More: ___
Visits to the library	0	1	2	3	4	5	6	7	8	More: ___
Watching educational television (TV)	0	1	2	3	4	5	6	7	8	More: ___
Other: _____	0	1	2	3	4	5	6	7	8	More: ___
Other: _____	0	1	2	3	4	5	6	7	8	More: ___
Other: _____	0	1	2	3	4	5	6	7	8	More: ___

Total Time in Educational Activities

Please provide an estimate of the amount of time *you* have spent with your child in educational activities over the past week:

NOTE: Do not count time spent completing lesson plans

_____(minutes)

Please provide an estimate of the amount of time *other adults in your home* have spent with your child in educational activities over the past week:

_____(minutes)

Appendix G: Lesson Observation Checklist

Observation Checklist- Intervention Integrity

Parent's Name: _____Child's Name: _____

Date: _____ Observer: _____

Lesson Plan #: _____

Location of observation (describe):

Task	Rating
Parent has materials ready before beginning with child (cards out, correct lesson open, writing utensil)	Y N N/A
Parent fills out top portion of lesson plan (excluding "End Time")	Y N
Letter Check	
Parent holds letter cards where child can easily see	Y N
Parent holds up all 26 cards in Letter Check	Y N
Parent presents cards out of alphabetic/ABC Order	Y N
Parent records child's correct and incorrect responses in Letter Check	Y N
Parent corrects child's *incorrect* responses	Y N N/A
Parent gives at least intermittent praise for correct responses	Y N
Teaching New Letter	
Parent has correct image card and letter card for new letter in lesson	Y N
Parent holds two cards next to each other to teach new letter	Y N
Parent correctly says scripted statement to teach letter	Y N
Parent gets child to repeat sentence	Y N
Parent praises child for repeating or corrects sentence	Y N
Parent states letter name correctly	Y N
Parent gets child to repeat letter name	Y N
Parent gets child to repeat sentence and name together	Y N
Fading Prompts	
Parent holds up both cards and says sentence and letter with child	Y N
Parent holds up both cards and whispers sentence and letter with child	Y N
Parent holds up letter card (removes picture) and child whispers letter	Y N
Parent has child say letter name	Y N
Letter Review	
Parent has all six cards (3 letter, 3 picture) ready to go	Y N
Parent presents 3 correct letter cards	Y N
Parent presents 3 correct picture cards	Y N
Parent presents first letter & picture and reads prompt	Y N
Parent provides praise, correction, or reminders to child for first letter	Y N
Parent presents second letter & picture and reads prompt	Y N
Parent provides praise, correction, or reminders to child for second letter	Y N
Parent presents third letter & picture and reads prompt	Y N
Parent provides praise, correction, or reminders to child for third letter	Y N

Sound Practice	
Parent reads *first* prompt	Y N
Parent records child's response	Y N N/A
Parent correctly categorizes child's response as correct/incorrect	Y N
If child's response is incorrect, parent provides correction	Y N N/A
If child's response is correct, parent praises child	Y N N/A
Parent reads *second* prompt	Y N
Parent records child's response	Y N N/A
Parent correctly categorizes child's response as correct/incorrect	Y N
If child's response is incorrect, parent provides correction	Y N N/A
If child's response is correct, parent praises child	Y N N/A
Parent reads *third* prompt	Y N
Parent records child's response	Y N N/A
Parent correctly categorizes child's response as correct/incorrect	Y N
If child's response is incorrect, parent provides correction	Y N N/A
If child's response is correct, parent praises child	Y N N/A
Parent reads *fourth* prompt	Y N
Parent records child's response	Y N N/A
Parent correctly categorizes child's response as correct/incorrect	Y N
If child's response is incorrect, parent provides correction	Y N N/A
If child's response is correct, parent praises child	Y N N/A
Parent reads *fifth* prompt	Y N
Parent records child's response	Y N N/A
Parent correctly categorizes child's response as correct/incorrect	Y N
If child's response is incorrect, parent provides correction	Y N N/A
If child's response is correct, parent praises child	Y N N/A
Parent completes rating of session (circles number)	Y N
Parent provides explanation for rating after "Why?" prompt	Y N
Parent enters stop time at top of left page	Y N

Rate the child's engagement in the session:

Not at all engaged			Intermittent engagement			Very engaged
1	2	3	4	5	6	7

Rate the quality of the parent's delivery of the intervention:

Poor			Adequate			Excellent
1	2	3	4	5	6	7

Comments:

Appendix H: Intervention Rating Profile-13

Intervention Rating Profile

	Strongly Disagree	*Disagree*	*Slightly Disagree*	*Slightly Agree*	*Agree*	*Strongly Agree*
1.This was an acceptable intervention for my child's kindergarten readiness.	1	2	3	4	5	6
2.Most parents would find this intervention appropriate for increasing their child's early reading skills.	1	2	3	4	5	6
3.This intervention did prove effective in increasing my child's early reading skills.	1	2	3	4	5	6
4.I would suggest the use of this intervention to other parents.	1	2	3	4	5	6
5.My child's early reading skills were behind enough to warrant use of this intervention.	1	2	3	4	5	6
6.Most parents would find this intervention useful for helping children with their early reading skills.	1	2	3	4	5	6
7.This intervention did *not* result in negative side-effects for my child.	1	2	3	4	5	6
8.This intervention would be appropriate for a variety of children.	1	2	3	4	5	6
9. This intervention was a fair way to increase my child's early literacy skills.	1	2	3	4	5	6
10. This intervention was reasonable for increasing my child's early literacy skills.	1	2	3	4	5	6
11. I liked the procedures used in this intervention.	1	2	3	4	5	6
12. This intervention was a good way to handle my child's early literacy concerns.	1	2	3	4	5	6
13. Overall, this intervention was beneficial to my child.	1	2	3	4	5	6

Appendix I: Informed Consent

Study ID:Pro00002982 Date Approved: 3/21/2011 Expiration Date: 3/21/2012

Informed Consent

Dear Parent or Legal Guardian:

This letter provides information about a research study that will be conducted in the Head Start Classroom by investigators from the University of South Florida. Our goal in conducting the study is to determine the effect of a parent-implemented early literacy activity on children's early literacy skills, behavior, and family outcomes.

- ✓ Who We Are: Dr. Kathy Bradley-Klug, an Associate Professor in the College of Education at the University of South Florida (USF), is the Primary Investigator for this study which will be conducted in conjunction with the Early Childhood Research Group at USF. We are planning the study in cooperation with the Head Start program to make sure that the study provides information that will be useful to the program.
- ✓ Why We are Requesting You and Your Child's Participation: This study is being conducted as part of a project entitled, "A parent-directed early literacy intervention package: Academic, behavioral, and family outcomes." Your child is being asked to participate because his or her scores on three early literacy skill assessments indicate that he or she is at risk for not acquiring skills necessary to easily learn how to read. Twenty-nine additional children and their parents will also be asked to participate in this study.
- ✓ Why You and Your Child Should Participate: We need to learn more about how parents can help their children improve their reading skills! The interventions we will be using have been effective when used by teachers to help children with their pre-reading skills and in a previous study with parents in Head Start. The information that we collect from children may help increase our awareness of how parents can help their children improve their reading skills. It is not certain that participating in this study will improve your child's reading skills.
- ✓ Compensation: By returning all forms, you and your child will receive compensation of $20 in the form of a Walmart giftcard for participation in this study. In addition, you will be provided with a children's books at the completion of the study. The $20 will be divided up into $2 per week if you decide to decline participation during the study (i.e., if you participate for 5 weeks you will receive a $10 giftcard).
- ✓ What Participation Requires: If you consent to participate in the study, you will be asked to participate in a reading program provided by the research team at the Head Start Center in the Spring or early Summer of 2011. Parents and their children who choose to participate will be matched based on gender, age, and child test scores and then assigned to either the intervention or control groups. The intervention group will receive the intervention first and the control group will receive the intervention later in the year (approximately June 2011). To give the intervention, parents must attend a training that will last for 30-60 minutes. The intervention will last 9 weeks. You will be asked to do the early literacy activities for 15-20 minutes a day, 3 days a week and complete surveys of home activities, your child's behavior, and parenting efficacy. In addition to doing the reading activity with you, your child will engage in brief early literacy skills assessments, 5 times over approximately 3 months. To examine that the intervention is used properly, two meetings will be set up where a member of the research team will observe you completing a lesson. These meetings will be set up at a time and place that is convenient for you (i.e., your home or Head Start Center). In addition, researchers will follow-up with parents in the Fall of 2011 and ask them to complete surveys one final time.
- ✓ These skill assessments require that your child name letters, retell a story, name and describe common objects, and say the beginning sounds of words for the trained researchers for less than 15 minutes per session, and will take place in the Head Start center during regular school hours.
- ✓ Please Note: Your decision to participate and to allow your child to participate in this research study must be completely voluntary. You are free to participate in this research study or to withdraw at any time. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your child's student status, his or her grades, or your relationship with Head Start, USF, or any other party.

Appendix I (Continued)

Study ID:Pro00002982 Date Approved: 3/21/2011 Expiration Date: 3/21/2012

Informed Consent

- ✓ Confidentiality of Your Child's Responses: There are no known risks to your child for participating in this research. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, employees of the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but your child's individual responses will not be shared with school system personnel or anyone other than us. Your child's completed assessments and recordings will be assigned a code number to protect the confidentiality of his or her responses. Only we will have access to the locked file cabinet kept by the Primary Investigator that will contain: 1) all records linking code numbers to participants' names, and 2) all information gathered from assessments and surveys. All records from the study (completed surveys, assessments) will be destroyed in five years.
- ✓ What We'll Do With You and Your Child's Responses: We plan to use the information from this study to inform educators and psychologists about the effect of the parent reading activity on children's reading skills. The results of this study may be published. However, the data obtained from you and your child will be combined with data from other people in the publication. The published results will not include you or your child's name or any other information that would in any way personally identify you or your child.
- ✓ Questions? If you have any questions about this research study, please contact Kathy Bradley-Klug at (813) 974-9486. If you have questions about your child's rights as a person who is taking part in a research study, you may contact a member of the Division of Research Integrity and Compliance of the USF at (813) 974-5638.
- ✓ Want You and Your Child to Participate? To confirm you and your child's participation in this study, please complete the consent form below.

Sincerely,

Kathy Bradley-Klug, Ph.D., NCSP
Associate Professor and Coordinator
School Psychology Program
University of South Florida

Consent for Parent and Child to Take Part in this Research Study

I freely give my permission to take part and let my child take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

_____	_____
Printed name of child	Date
_____	_____
Signature of parent of child taking part in the study	Printed name of parent

Statement of Person Obtaining Informed Consent

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

_____	_____	_____
Signature of person obtaining consent	Printed name of person obtaining consent	Date

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Appendix J: Handbook for Parent Trainings

Handbook on Parent Trainings

Table of Contents

Introduction

(Say for both groups)

Hello, my name is _____. I am a student/faculty member at the University of South Florida. We are meeting because you have indicated that you are interested in participating in a research study being done by a team at USF through local Head Start Centers. Today we are going to review a little about the study and what would be expected for you to complete, filling out some surveys so we can find out more about you and your family, and giving you materials for your group related to the study. We will also explain how to use these materials before we end today.

Informed Consent- Control Group

You have been selected to be in the group that will receive the reading program later in the summer. While you are waiting, we are still going to ask you to fill out everything that the other families will fill out. We will also continue screening your child at 4 different points during the next 3 months.

After all of these forms are returned, we will give you the $20.00 giftcard and a children's book for your home. You will also receive the reading program and training on how to use it at the same time in July (2011).

While you are waiting, we have compiled the list of tips, which we will be going over today, to practice reading at home.

Pull out Informed Consent Documents
These two pages are exactly alike. One is for you to sign and return to us if you are still planning on participating in the study, the other is for you to keep. I can give you a few minutes to read the form over or if you would like, I can read it for you *(meaning read it verbatim)*, or give you the main points from each section. *If they select the main points from each section, say the items below, pointing to the headline of each section:*

- The "Who We Are" section explains that Dr. Kathy Bradley-Klug and the Early Childhood Research Team at USF are conducting the study in cooperation with Head Start.
- The "Why We are Requesting your Participation" section tells you the title of the study is called "A parent-directed early literacy intervention package: Academic, behavioral, and family outcomes" and that 29 additional children and parents will be participating. You are being asked to participate because your child has been identified as at-risk for not developing important early reading skills to be able to easily learn how to read in kindergarten.
- The "Why you should Participate" tells you that we really want to know how parents can improve their child's reading skills and if these

previously effective reading strategies work when parents use them. It is not certain that completing these activities will increase your child's skills.

- "Compensation" explains that you have to return all forms to receive the $20 giftcard to Wal-Mart. We will also provide you with a children's book if you have returned everything. If you choose to not return items, we will provide you $2 for each week you participate in the study.
- "What participation requires" from you specifically is that you try to implement the reading tips we provide you today over the next few weeks and complete and return some surveys. These surveys will be shorter packets of the ones we will complete today. We will send these forms home every three weeks and ask you to complete them and return them to the Head Start center. We will call to let you know when the forms go home and to remind you to return them. Also, we will follow up with you in the Fall of next school year and ask you to complete the surveys one more time. Your child's early reading skills will be measured 5 times between now and the Fall of next year. These will be done as they were before, by pulling your child out of their classroom for 15-20 minutes.
- "Please note" tells you that your decision to participate is voluntary. If you choose to participate or not participate, it will not affect anything with Head Start, USF, or anyone else.
- "Confidentiality" explains that we do not know of any risks to completing this research study. We will keep all your responses and your child's responses confidential, or private, and secure all documents at a location at USF. After 5 years we will destroy these forms.
- "What we'll do" explains that we want to use this information to help educators and others learn using the reading program and the reading strategies at home to help children in preschool. We do plan to publish the results from this research, but we will not put in any information that would allow others to identify you or your child.
- Questions- This section provides two phone numbers for you to contact Dr. Kathy Bradley-Klug or the USF Review Board who approved this study.
- **Do you have any questions for me?**

If you would like to participate (Point to spaces), please print your child's name here, put the date (*_say date_*) here, sign your name here, and print your name here. **I will complete the bottom portion.**

- Take the green form from every parent who chooses to participate.
- **If a parent chooses not to participate**→ Thank them for their time and initial interest, and let them know that they can leave. They do not get materials because we will give them to another family who is interested.

Survey Completion- Control Group

We will now have you fill out measures for the research study.

- Please answer each question honestly since there are no right or wrong answers.
- Read each question carefully, but do not spend too much time on any one question.
- Answer all questions based on the child that is in the study (not based on other children they have)
- There may be some questions that are similar, but we want you to answer each one. We ask some things in different ways to that we really get your feelings on things. Finally, some surveys ask you to respond to different time periods, like over the last 3 months, or over the past week. Please pay attention to this wording.
- We are here to answer questions at any time.
- Notes for specific measures (do not need to be read)
    - Home Activities- should be completed based on the **past week**. Also, parents may be confused about prompts about lesson plans- tell them to disregard those.
    - PKBS-2- Complete items based on the last 3 months
    - ADHD-IV- Complete items based on the last 6 months
    - Role Construction- The first section has parents rating their beliefs about whether the activities are the parent's responsibility. The second section refers to the parents' experience with school when they were younger.

Allow parent to complete surveys and answer any questions. After they have completed the surveys:

- Look through to see if all forms look to be answered- If not prompt the parent to complete specific sections (make sure demographics are complete!)
- Thank the parent for completing them. *When all parents are finished*, begin the training session.

Parent Training- Control Group

Now I will explain the materials in this packet. On the first page, you can see what is included in the packet and see the contact information for the Project Coordinator, Ashley [redacted]. All materials from this packet came from the Reach Out and Read Program materials that pediatricians give out to families during visits.

First, we will look at the checklist. This gives you a way to look at what you are doing at home to promote reading readiness. In addition, it provides ideas for what other things you could be doing in your home.

- To fill out this checklist (don't do it now), just check whether each sentence is true or false for you. Then you can count all of the checked "TRUE" boxes and see how you are doing at home to promote reading readiness.
- At the bottom of the second page (in the middle), this scale lets you know how you are doing.
- If you would like your number to be higher, look back at the boxes checked as FALSE and see which ones you can start doing in your home.

Any questions? (We do not need them to turn this in. This is just for them to use)

The next page (Page 4) has some common milestones, or important skills, related to reading for preschoolers. These skills are:

- Holding a book correctly (positioned with cover at front and opening to right)
- Turns book pages one at a time
- Sits and listens to longer stories (for about 10-15 minute stories)
- Retells a familiar story (It is OK if your child loves to "read" the same book every time and has memorized the story and tells it back to you).
- Understands what text is (i.e., knows that text represents words)
- Moves finger along with text (i.e., points left to right across text)
- "Writes" their name (Attempts to make letters to spell out name)- (It is typical for these to not be correct)
- Begins recognizing letters, such as the first letter of their name

If your child is not doing these things, you can begin working on them at home by practicing each skill a few times a week. **Any questions?**

A parent may ask you about how to teach one of these skills- if you feel comfortable, answer it. If you are not sure, have them contact Ashley [redacted].

Pages 5-6 present some tips to making reading with your child more engaging. Page 5 talks about a strategy called dialogic reading. There is one main strategy of prompting the child to talk about the book and then the parent talks with them more about it.

The main strategy can be remembered by using the word **PEER**:

- P stands for **Prompting** the child to say something about the book- For example, "What does a dog say?" or "Do you have any pets?"
- E stands for **Evaluating** the child's response- For example, "That's right! A dog says woof woof!" or "You're right! You have a pet fish!"
- E stands for **Expanding** on the child's response- An example would be "A dog says woof and a cat says meow." or "Your pet fish's name is Goldy and it is yellow!"
- R stands for **Repeating** the prompt with another example- For example "What does a cow say?" or "Who else has a pet?

This process can be repeated many times with any story. The main idea is to get you and your child talking beyond just reading the text in the book.

There are several types of "prompts" that you can use to vary up your questions. That's how the word **CROWD** is helpful.

- C stands **Completion** prompts where your child will complete a sentence about the story.
    - "I do not like Green Eggs and Ham. I do not like them Sam I _____."
    - "If you give a mouse a _____."
- R stands for **Recall** prompts where you ask your child what happened in a story that has already been read.
    - "Did Sam like Green Eggs and Ham?"
    - "What did the mouse like to have with his cookie?"
- O stands for **Open-ended** prompts about the picture or story
    - "What is Sam doing in this picture?"
    - "Where do you think the mouse will want to sleep?"
- W stands for **What, When, Where, and Why** prompts that have you ask one of these questions about the story.
    - "What is Sam holding?"
    - "Where do you find the refrigerator?"
- D stands for **Distancing** prompts relate the story to the child's life.
    - "Look at Sam's doggy. Do you have a doggy?"
    - "Look at that cookie? Do you like to eat cookies?"

Do you have any questions?

The sixth page has more tips for reading at home. I will read each one for you:

- Read together every day- Reading can happen as part of a bed time routine or at any part of the day you and your child have time together
- Ask, "What's happening?" when looking at a picture- Have your child describe what they think is happening before you read the text.
- Let your child tell the story- it doesn't matter if their story does not match the text
- Choose books that tell stories, contain numbers, or the alphabet
- Have your child sit close to you or on your lap while reading
- Visit the children's room at the library so your child can choose more books
- Give everything a name- Name objects in pictures and ask questions about them
- Say how much you enjoy reading with your child- Share with your child that you enjoy your special time with him and her. Tell them that "story time" is the favorite part of your day.
- Read with fun in your voice- Give characters different voices and really bring the text to life! Don't be afraid to ham it up!
- Know when to stop- If your child loses interest or is not paying attention, put the book away for awhile.
- Read it again, and again, and … again- It's perfectly OK to read a book many times.

- Talk about writing too- Point out how we read from left to right (and top to bottom). Show your child that words are separated by spaces and have them point out letters or words they may know on a page.
- Point out print everywhere- Talk about the words you see in the world around you. Ask your child to find (*this word was originally left out*) a new word on each outing you all go on together.

The final pages are lists of books that you can look for at the local library. Feel free to look through later on and select titles you think your child might be interested in.

That is everything that we had planned to cover today. Thank you for being patient and paying attention.

Are there any other questions?

If anything comes up later on, feel free to call Ashley [redacted], whose number is on the front of this packet.

Informed Consent- Treatment Group

You have been selected to be in the group that will immediately get the reading program. While you are completing the program, we will be asking you to fill out some surveys and return lesson plans to us by giving them to the social worker at your Head Start. We will also continue screening your child at 4 different points during the next 3 months.

After all of the surveys and lesson plans are returned, we will give you the $20.00 giftcard and a children's book for your home. You will receive this in July (of this year).

Pull out Informed Consent Documents
These two pages are exactly alike. One is for you to sign and return to us if you are still planning on participating in the study, the other is for you to keep. I can give you a few minutes to read the form over or if you would like, I can read it for you *(meaning read it verbatim)*, or give you the main points from each section. *If they select the main points from each section, say the items below, pointing to the headline of each section:*

- The "Who We Are" section explains that Dr. Kathy Bradley-Klug and the Early Childhood Research Team at USF are conducting the study in cooperation with Head Start.
- The "Why We are Requesting your Participation" section tells you the title of the study is called "A parent-directed early literacy intervention package: Academic, behavioral, and family outcomes" and that 29 additional children and parents will be participating. You are being asked to participate because your child has been identified as at-risk for not developing important early reading skills to be able to easily learn how to read in kindergarten.
- The "Why you should Participate" tells you that we really want to know how parents can improve their child's reading skills and if these previously effective reading strategies work when parents use them. It is not certain that completing these activities will increase your child's skills.
- "Compensation" explains that you have to return all forms to receive the $20 giftcard to Wal-Mart. We will also provide you with a children's book if you have returned everything. If you choose to not return items, we will provide you $2 for each week you participate in the study.
- "What participation requires" from you specifically is that you complete the reading program by doing three lessons each week for 9 weeks. These lessons usually take 15-20 minutes each. After you complete the lessons, you will return them to the Head Start Center. We will also ask you to complete and return some surveys. These surveys will be shorter packets of the ones we will complete today. We will send these forms home every three weeks and ask you to complete them and return them to the Head Start center. We will call to let you know when the forms go

home and to remind you to return them. Also, we will follow up with you in the Fall of next school year and ask you to complete the surveys one more time. Your child's early reading skills will be measured 5 times between now and the Fall of next year. These will be done as they were before, by pulling your child out of their classroom for 15-20 minutes.
    - We also need to check to see how you are completing the lessons. Over the next 9 weeks, we will set up 2 meetings with you to observe you completing a lesson with your child at your home, the Head Start or somewhere else convenient for you.
- "Please note" tells you that your decision to participate is voluntary. If you choose to participate or not participate, it will not affect anything with Head Start, USF, or anyone else.
- "Confidentiality" explains that we do not know of any risks to completing this research study. We will keep all your responses and your child's responses confidential, or private, and secure all documents at a location at USF. After 5 years we will destroy these forms.
- "What we'll do" explains that we want to use this information to help educators and others learn using the reading program and the reading strategies at home to help children in preschool. We do plan to publish the results from this research, but we will not put in any information that would allow others to identify you or your child.
- Questions- This section provides two phone numbers for you to contact Dr. Kathy Bradley-Klug or the USF Review Board who approved this study.
- **Do you have any questions for me?**

If you would like to participate (Point to spaces), please print your child's name here, put the date (_*say date*_) here, sign your name here, and print your name here. **I will complete the bottom portion.**

- Take the green form from every parent who chooses to participate.
- **If a parent chooses not to participate**→ Thank them for their time and initial interest, and let them know that they can leave. They do not get materials because we will give them to another family who is interested.

Survey Completion- Treatment Group

We will now have you fill out measures for the research study.

- Please answer each question honestly since there are no right or wrong answers.
- Read each question carefully, but do not spend too much time on any one question.
- Answer all questions based on the child that is in the study (not based on other children they have)
- There may be some questions that are similar, but we want you to answer each one. We ask some things in different ways to that we really get your feelings on things. Finally, some surveys ask you to respond to different time

periods, like over the last 3 months, or over the past week. Please pay attention to this wording.
- We are here to answer questions at any time.
- Notes for specific measures (do not need to be read)
    - Home Activities- should be completed based on the **past week**. Also, parents may be confused about prompts about lesson plans- tell them to disregard those.
    - PKBS-2- Complete items based on the last 3 months
    - ADHD-IV- Complete items based on the last 6 months
    - Role Construction- The first section has parents rating their beliefs about whether the activities are the parent's responsibility. The second section refers to the parents' experience with school when they were younger.

Allow parent to complete surveys and answer any questions. After they have completed the surveys:
- Look through to see if all forms look to be answered- If not prompt the parent to complete specific sections (make sure demographics are complete!)
- Thank the parent for completing them. *When all parents are finished*, begin the training session.

Parent Training- Treatment Group

Now, we will show you how to complete the lessons in the manual. First, we will look through and show you how the manual is laid out. Then we will show you how to complete a lesson by having _(say name)____ be the parent, and _(say name)____ be the child. Finally, we will divide up and give you the chance to practice on a different lesson with us acting as children. As we go through we will provide prompts and feedback to you.

Let's look through the notebook:
Point out:
- The DVD in the front pocket- displays Ashley [redacted] completing a lesson with a child and allows parents to watch it to get tips on how to complete lessons. Gives parents a chance to review information from this training once they are home.
- The zippered pocket contains 2 types of cards- ones with 2 letters on the front and ones with pictures on one side and letters on the back. For each lesson, you will need all letter cards, but only 4 specific picture cards. We will explain this as we go over the lesson.
    - This pouch can be a great place to store a pen/pencil so you always have one
- The next page has some tips for how to praise your child.
- The rest of the notebook contains the 27 lessons you will complete with your child. Each week you should complete 3 lessons, but you can split them up on any days you like. Just try not to do more than one lesson in any day.

CHILD'S ROLE in Modeling or when paired with Parent: Act as a preschool child would, being sure to get at least one or two wrong in each section of the lesson. Feel free to be distractible, answer completely incorrectly, or focus on the first letter in your name if you see it (common experiences these parents will have).

PARENT'S ROLE for Modeling: Now we will show you how to complete a lesson. _____ will be the child and I will be the parent. We will be completing lesson 10 if you would like to look and follow along. **Hand parents the copy of Lesson 10.** *You can ask questions at any time.* The goal of today is getting you comfortable with doing this at home.

Before the Lesson
Before you start the lesson with your child, you need to get some materials together. This will make the lesson go smoothly and quickly and keep your child from getting bored or inpatient while you look for things. You need to get out:

- All letter cards
- The 4 picture cards for the New Letter and for the Letter Review (point these items out on the lesson plan). For this lesson, I need the Jeans, Dessert, Toys R Us, and Broken crayon pictures. *(Pull out and set to side)*
- A pencil and the lesson booklet open to the page.

Before starting, I will fill out the top with **My name, My "Child's" Name, the Date,** and **the Start Time.** Then I will call ___(other trainer's name__ over to start.

Letter Check
First in the lesson is the Letter Check. Here we just hold up each letter card and see if the child can name the letter. The letter cards do not need to be in any order. If it is right, we put a check, if it is wrong we put an X. If the child gets the letter wrong, you will just say the name of the letter to them, nothing else.
Demonstrate by going through each letter card, placing Checks next to right answers and X's next to wrong ones. If the "child" gets one wrong, say "That's a ___" (letter name).
After going through all the letters, you will look quickly look to see that each has a mark. If so, circle Yes. If not, look and see which card is missing and go back. Pull out the G, D, R, and O cards. Set D,R, and O to the side with their pictures

New Letter for Today
Next, you will teach a new letter to your child by pairing it with a picture and a sentence. The sentence has the LETTER NAME (not sound) in it. For today, we will learn the NAME of the letter G by learning the sentence "I like to wear blue **je**ans." To teach the sequence, follow the instructions by reading aloud the parts in italics/slanted text.

Transition to the lesson and follow by reading the text/completing the actions.

- Be sure to give enthusiastic praise and toe praise efforts. When you do this, point it out to the parents
- Be sure to circle/fill out each part of the lesson.

Letter Review
Here, you will review the letters from the last 3 lessons, which are D, R, & O. Make sure you have all of the cards you need ready (pull out the Dessert, Toys R Us, and Broken Crayon pictures). **Transition to the lesson plan and complete the reading of the text.**

- *When the "child" gets one wrong, repeat either the sentence or the letter name. Then have the child repeat it.*
- **Share with parent:** If the sentence is close and contains the letter name, it is correct (e.g., if a child says "I love dessert" instead of "I like dessert- it is correct. If the child says "I like ice cream"- it is wrong because it doesn't have the letter name).

Sound Practice
This is a totally separate section that teaches a different skill. There are two types of questions that you see in here. The first has your child compare two words to decide if they start with the same sound. The second type of question has your child make the first sound in a word. If your child does not get an answer correct, you will provide them with the correct answer by repeating the question and saying the answer. If needed, it is ok to stretch out the word like saying /ssssun/ instead of /sun/. Watch how I complete this section.
Transition to the Sound Practice on the lesson plan. Go through each question and follow the correction procedure:

- Repeat the two words and then say do/don't start the same- Example: *Sssee and ddduck do not start with the same sound* or *Bed and Back do start with the same sound.*
- **Point out to the parents that for some questions the answer is provided for them. Other questions require the parent to determine if their child's response is correct. Parents will need to listen and see if the child said just the first part of the word. *If needed, practice this with parents.***
    - First sound in duck is /d/, first sound in fish is /f/, first sound in phone is /f/, first sound in cat is /k/, first sound in moon is /m/, first sound in paper is /p/

End of Lesson
After completing those sections, your child is all finished and you can let them go play. *(Ask "child" to go play).* You just need to finish a few more things.

At the bottom, provide a rating of how you think the session went from 1-5. Then give a brief description of Why you feel that way. I will fill this out as this session going as a 4, because I think _(child's name)__ tried hard, but I still need to work on making everything smoother. *(You can change this if something else comes to mind…)*

I will also go back to the top of the left page and fill in the End time. The final step is to fill out any problems or concerns you have. At any time you can contact Ashley [redacted] at the phone number or email address at the bottom.

Any questions before you give it a try? Answer any questions

Pair off with parents and hand them a copy of Lesson 11. Make sure they prepare all materials before calling "their child" (you) over. Go through each section and correct any mistake the parent makes. Make sure they repeat each question/part that they made a mistake. Make sure the lesson is completely filled out for each section or break character at the end of each section to prompt them. *At the end, prompt for further questions.*

Lesson Planning in the Home
Finally, we need to talk about when and where you plan on doing these lessons.

- **Where in your home do you plan on doing the lessons?**
    - Listen to see if there is a table to work at, few distractions, and is comfortable for the child- if not stated, inquire about these things
- **Do you have other children at home?**
    - If yes and the children are younger, help the parent think about ways to keep these children occupied while they work with one child.
- **When do you think you will do the lessons?**
    - Make sure there are few distractions and it is not really late at night. It should be a good time for both the parent and child (e.g., not making dinner, or after the child's bedtime.
- **Can you think of anything that would prevent you from completing these lessons 3 times a week?**
    - Help parent think of ways to overcome these barriers. We will be calling them weekly to remind them to complete lessons.

Appendix K: Letter of Approval from USF IRB

USF
UNIVERSITY OF SOUTH FLORIDA

DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-5618

March 21, 2011

Kathy Bradley-Klug
Psychological and Social Foundations
4202 E. Fowler Ave.
EDU105

RE: **Expedited Approval** for Initial Review
IRB#: Pro00002982
Title: A Parent-Directed Early Literacy Intervention Package: Academic, Behavioral, and Family Outcomes

Dear Kathy Bradley-Klug:

On 3/21/2011 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol**.** Please note that your approval for this study will expire on 3-21-12.

Approved Items:
Protocol Document(s):

Protocol	2/3/2011 4:31 PM	0.01

Study involves children and falls under 45 CFR 46.404: Research not involving more than minimal risk.

Consent/Assent Documents:

Name	Modified	Version
Parent Form.pdf	3/21/2011 3:25 PM	0.01
Teacher Form.pdf	3/21/2011 3:25 PM	0.01

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:
(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or

quality assurance methodologies.

Please note, the informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form. Valid consent must be documented on a copy of the most recently IRB-approved consent form.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, PhD, Chairperson
USF Institutional Review Board

Cc: Various Menzel, CCRP
USF IRB Professional Staff