

GOODSON, LAUREN K., M.S. Early Literacy and Language Development in Children with Disabilities. (2011)
Directed by Dr. Catherine Scott-Little. 106 pp.

Early literacy and language development are crucial to future learning and development and, for children with disabilities, these skills can be fostered through various elements in early care and education settings. Using data from the South Carolina Bridges to Early Learning Project, this study investigates the relationships between classroom environments, curriculum experiences, teachers' education, training and practices and children's time of IEP implementation with literacy and language progress. Bronfenbrenner's bioecological model, considering Process, Person, Context and Time as all being pertinent to children's development, is used to frame the study. Although correlational analyses did not present significant findings for environment, experiences or teachers, a t-test comparing growth based on children's gain scores on the Peabody Picture Vocabulary Test- Third Edition indicates that timing of Individualized Education Plan (IEP) implementation is vital to children with disabilities early literacy and language development. The implications for results of factors contributing to early literacy and language development for children with disabilities is discussed.

EARLY LITERACY AND LANGUAGE DEVELOPMENT IN CHILDREN WITH
DISABILITIES

By

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A Thesis Submitted to
The Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment of
the Requirements for the Degree
Master of Science

Greensboro
2011

Approved by

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November 2, 2011
Date of Acceptance by Committee

November 2, 2011
Date of Final Oral Examination

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CHAPTER I

INTRODUCTION

With much attention paid to school readiness, it is important to consider issues related to early care and education environments, experiences, and teacher quality especially when a child may be at-risk for or have a disability. Preschool programs, such as Head Start and Pre-Kindergarten child care programs offer one avenue that may help to prepare children with disabilities for formal schooling. While in a preschool program, children with disabilities can socialize with other children their age, participate in various cognitive, physical, and creative activities, and form relationships with both children and adults. One of the areas of development for children with disabilities that may be greatly influenced by a preschool program is early literacy and language. This study will, therefore, explore how features of early care and education classrooms and teaching practices are related to the progress children with disabilities make on measures of their language and literacy development.

Early literacy and language development are essential to school success for all children (Dickinson & McCabe, 2001; Whitehurst & Lonigan, 1998). When some people think about early literacy and language development in preschool programs, they focus on letters being taught, songs being sung, and stories being told, but quality early literacy experiences involve much more. Dickinson and McCabe (2001) specifically point out that children's skills in the areas of phonology, vocabulary, syntax, and discourse are

important aspects of children's early literacy and language development. Along with these components, Whitehurst & Lonigan (1998) suggest that early writing skills, from scribbles to drawings to name writing, are also a part of emergent literacy. All of the aspects of early literacy and language working together in a preschool program have the potential to impact children's school readiness.

In 2007, there were approximately 700,000 children from birth to age five with diagnosed disabilities in the United States (U.S. Department of Education). Children considered "at-risk" for having a disability and children already diagnosed with a disability may be in jeopardy of developing early literacy and language skills at a slower rate than typically developing children because of physical, cognitive, or environmental limitations (Weikle & Hadadian, 2004). These children could be at a disadvantage once they begin formal schooling because they don't come to Kindergarten with the same skill sets as their typically developing peers. Through Part C of the Individuals with Disabilities Education Act (IDEA), children with diagnosed disabilities and children at-risk for developmental delays are able to participate in early care and education programs (Peterson, Wall, Raikes, Kisker, Swanson, Jerald, Atwater, & Qiao, 2004). A limited number of studies have examined the language and literacy development of children with disabilities. Kliever, Fitzgerald, Meyer-Mork, Hartman, English-Sand, and Raschke (2004) completed an ethnographic study on nine inclusive, including both typically developing children and children with disabilities, preschool and kindergarten classrooms where children with disabilities were receiving services and found that even children with the most severe disability could develop their early literacy and language skills. If

children at-risk for or with disabilities participate in some kind of preschool program, then it is possible that these children may acquire early literacy and language skills they need to succeed once they enter school.

With approximately 6 million children estimated in early care and education settings outside of their home (National Child Care Information and Technical Assistance Center, 2010), preschool programs play an important role in early literacy and language development for a significant number of children. The physical classroom environment and the curriculum experiences provided are two aspects of preschool programs that may influence early literacy and language development (Clark & Kragler, 2005; Clawson & Luze, 2008; Kliwer et al., 2004; Missall, McConnell, & Cadigan, 2006; Neuman, 1999; Roskos, Ergul, Bryan, Burstein, Christie, & Han, 2008; Weikle & Hadadian, 2004). Features of the environment that may be of particular importance to early literacy and language are presence of books, examples of written word, materials for writing and drawing and space set up specifically for early literacy and language activities such as a reading or writing area (Clark & Kragler, 2005; Kliwer et al., 2004; Missall, McConnell, & Cadigan, 2006; Neuman, 1999). Early literacy and language experiences may be present in curriculum learning activities that teachers implement (Clawson & Luze, 2008; Justice, Mashburn, Hamre, & Pianta, 2008; Kliwer et al., 2004; Missall, McConnell, & Cadigan, 2006; Neuman, 1999; Roskos et al., 2008; Weikle & Hadadian, 2004) as well as more informal child and teacher interactions and general teacher practices (Bryant, Burchinal, Lau, & Sparling, 1994; Dickinson & McCabe, 2001; Gest, Holland-Coliello,

Welsh, Eicher-Catt, & Gill, 2006; Justice et al., 2008; Justice, Kaderavek, Fan, Sofka, & Hunt, 2009; Kliewer et al., 2004).

The overall purpose of the following study is to explore possible characteristics that may contribute to the early literacy and language development of preschool-aged children with disabilities in early care and education settings. Particular characteristics that will be explored include environment, curriculum experiences, teacher education, training, and practices, and time of the child's receipt of special education services. Features of the environment that will be examined include space and materials that relate to early literacy and language development, such as number of books available and accessibility of materials. Curriculum experiences will include learning activities such as opportunities to look at a book or draw a picture. Teacher characteristics will also be examined as a possible factor, including the teacher's education level, professional development and specific teaching practices. A final factor that will be explored is the timeframe within which children began receiving special education services. The impact of these factors on children with disabilities' early literacy and language development will be evaluated with measures that assess children's alphabet knowledge, vocabulary, rhyme awareness, letter sounds and writing ability. This study uses secondary data analyses of a data set from a study that focused on effects of teacher professional development on children's early literacy and language. It is important to note that research paying particular attention to early literacy and language development in children with disabilities is limited, therefore this study is exploratory in nature.

Hopefully more information about early literacy and language development of children with disabilities will be gained by conducting this study.

CHAPTER II

THEORY AND LITERATURE REVIEW

Theory

A theory that lends itself well to examining multiple aspects of child development is Urie Bronfenbrenner's bioecological model, which consists of the proximal processes of a person in a specific context over a period of time. In the Process, Person, Context, and Time (PPCT) model, proximal processes, the developing person engaging in the proximal processes, the context in which proximal processes are taking place, and the amount of time proximal processes go on are all important to development. Each feature of the PPCT model will be explained in further detail.

Proximal processes as defined by Bronfenbrenner (1994) are "enduring forms of interaction in the immediate environment" (p. 38). Development is facilitated when interactions are constant and get increasingly more difficult. Another important aspect of these interactions is that they support development when they are reciprocated between the developing individual and whatever they were interacting with be it another person, object, or symbol. Bronfenbrenner and Morris (2006) make it clear that proximal processes are of most importance to the developing person when they state that proximal processes power varies "substantially as a function of the characteristics of the developing *Person*, of the immediate and more remote *Contexts*, and the *Time* periods, in which the proximal processes take place" (p. 795). Person, context, and time in the

PPCT model may not be as heavily focused on, but are definitely essential to Bronfenbrenner's theory.

The person, in the PPCT model, obviously plays a vital role because he or she is engaging in the process. Within this feature of the PPCT model, genetics, physical and cognitive disabilities, and personality characteristics have the opportunity to change the proximal processes as well as the possible outcomes of proximal processes. Other characteristics such as age, gender, and language have the potential to affect the developing person. Bronfenbrenner also noted that it is possible for an individual's developmental potential to be directly influenced by their environment (1994, p. 41).

Microsystem, mesosystem, exosystem, and macrosystem are various levels of context that were a main focus of Bronfenbrenner's earlier bioecological model. A microsystem, as defined by Bronfenbrenner (1994), encompasses proximal processes within settings such as the developing person's family, school, peer group, and workplace (p. 39). Mesosystems look at processes of the developing person between two specific microsystems, such as home and school (p. 40). Exosystems take into consideration the processes of the developing person in two or more settings with at least one including the person (p. 40). Macrosystems "may be thought of as a societal blueprint for a particular culture or subculture" (p. 40) that includes the three previously mentioned systems.

A system that may be overlooked when examining Bronfenbrenner's theory is chronosystems. Chronosystems refer to the final piece of the PPCT model, time. The time facet of Bronfenbrenner's bioecological model is presented in three ways. The first of which is microtime which speaks to the endurance, or lack thereof, that a proximal

process has. A second level of time is mesotime. Mesotime, as defined by Bronfenbrenner and Morris (2006) “is the periodicity of these episodes across broader time intervals, such as days and weeks” (p. 796). And the final level of time is that of macrotime which takes into account time for society, such as events that are historically significant and could impact an individual’s development. Time described in these three levels made this aspect of Bronfenbrenner’s model complete.

Bronfenbrenner’s theory seems to be a good fit for the current study because all aspects of the PPCT model are represented. Proximal processes, from Bronfenbrenner’s PPCT model, are the focus of this study through children’s interactions with teachers, objects, and symbols in their environment pertaining to early literacy and language development. These processes are evaluated through observations. The developing persons in this study are children, specifically children with disabilities. Other characteristics of the person are recorded such as age, gender, race, and language. Only the microsystem is used as the context for this study. Children engaging in the proximal processes described previously were observed in a child care setting outside of their homes, particularly preschool classrooms. The final feature of Bronfenbrenner’s PPCT model, time, is illustrated in the evaluation of children’s abilities in the fall and the spring of the same school year. Fall and spring child evaluations suggest how the proximal processes the developing children were engaged in within their preschool classrooms possibly impacted their early literacy and language abilities over the course of the year. The current study seems to be aligned with Bronfenbrenner’s PPCT model because it specifically looks at the experiences children with disabilities are having in a child care

setting outside of their home over the course of a school year and how those experiences may affect their early literacy and language development.

Literature Review

Along with considering a theory that encompasses the developing child, the interactions children may be having with their surroundings, the setting where development may be occurring and how the interactions within the specific setting may affect the children over time, it is also important to present empirical evidence for each aspect of the study. The developing children in the current study have been diagnosed with a disability at some point in time. When reviewing available literature, there was not a great deal of evidence for children with disabilities' early literacy and language development. However, there does seem to be evidence of the importance of environment, curriculum, and interactions for early literacy and language development in general. Particular attention will be paid to studies for areas that have some research related to children with disabilities. In areas that don't have research for children with disabilities, research with typically developing children will be presented. The following section will present information on what typical literacy development looks like as well as literacy development for children with disabilities and empirical evidence for children's physical classroom environment, curriculum/interactions with curriculum, teachers' education level, training and practices, and children's time of diagnosis. Also included in this section is a brief overview and description of findings of the study from which the current study will use data is discussed.

Literacy development. Although children with disabilities may develop their language and literacy skills in a different way or at a different rate, some ideas hold true for all children's language and literacy development. Language and literacy development for all children, regardless of ability level, begins at birth for each child and is influenced by his/her social interactions with other children (Koppenhaver, Coleman, Kalman, & Yoder, 1991; Whitmore, Martens, Goodman, & Owocki, 2004). Koppenhaver et al. and Whitmore et al. also suggest that language and literacy skills develop concurrently and interrelatedly, meaning that development is not necessarily sequential. Areas that research has found to be important for all children to become literate include phonological awareness (Boudreau & Hedberg, 1999; Catts, 1991; Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003; Justice, Invernizzi, & Meier, 2002; Schuele, 2004), print awareness (Boudreau & Hedberg, 1999; Dickinson et al., 2003; Justice, Invernizzi, & Meier, 2002), letter name knowledge (Boudreau & Hedberg, 1999; Justice, Invernizzi, & Meier, 2002), letter sound awareness (Boudreau & Hedberg, 1999; Justice, Invernizzi, & Meier, 2002), and expressive and receptive vocabulary (Boudreau & Hedberg, 1999; Dickinson et al., 2003). However, typically developing children tend to develop these language and literacy skills faster than children with disabilities. The question then becomes why do children not develop these early language and literacy skills.

There are varying reasons for why children with disabilities do not develop early language and literacy skills at the same rate as their typically developing peers. One reason may be the disability itself makes it difficult to develop these skills. In a study of

children with speech impairments, language impairments, and both speech and language impairments, Schuele (2004) found that children with language impairments and combined speech-language impairments were most likely to have difficulty developing language and literacy skills essential to reading. Justice, Invernizzi, and Meier (2002) also suggest that children with a history of language impairment, attentional deficits, behavioral problems or cognitive impairments may have an even harder time developing early language and literacy skills. It is also possible that children with disabilities do not have many opportunities to practice language or use literacy materials because it is not a focus of parents and caregivers (Koppenhaver et al., 1991).

Now that early language and literacy development and skills have been considered for both typically developing children and children with disabilities, attention is turned to specific aspects of preschool programs that may impact development.

Physical classroom environment. Children's learning can be influenced through their surroundings. When considering early literacy and language development it is important to provide children with a print rich environment through books, writing materials, labels, posters, and signs (Clark & Kragler, 2005; Kliewer et al., 2004; Missall, McConnell, & Cadigan, 2006; Neuman, 1999). In Neuman's (1999) study of an intervention called Books Aloud, she found that simply the access to books made a difference in children's early literacy and language development. Children in the Books Aloud intervention had access to a large number of high-quality books at their sight level. Teachers also added rugs, pillows, and bean bag chairs to book areas, making the areas

more inviting. As a result, children became participants in their development by exploring the book areas and exposing themselves to written word. However, it should be noted that Neuman suggested that merely exposing children to books and creating a comfortable environment was not enough to help promote early literacy and language.

Writing materials that children can access not only during specific lessons, but also during free play contributes to an environment that promotes early literacy and language (Clark & Kragler, 2005; Missall, McConnell, & Cadigan, 2006). Missall, McConnell, and Cadigan (2006) conducted a study to examine the development of early literacy skills in preschool children who may encounter literacy problems later in life. Their study included children who had already been receiving special education services due to a speech-language disability, English language learners, children in Head Start classrooms and children in early childhood family education classrooms. One area where they focused their study was in the correlation between materials available to children and their early literacy growth. Specific materials examined included Instructional, such as letters, numbers, and different media used to teach early literacy skills, Pretend Toys, and Storybooks. The areas of children's early literacy and language development examined in the study included Picture Naming, Rhyming, and Alliteration. Results for children with speech-language disabilities found moderate correlations between Alliteration growth and time with instructional materials as well as a small correlation between Rhyming growth and time with instructional materials. Also, for children with speech-language disabilities, early literacy and language growth was highly correlated with instructional materials when materials were used for learning colors, shapes, and

numbers. Similar to children with disabilities, a slight correlation was found between Alliteration growth and time with instructional materials for English language learners. Unlike children with disabilities, Picture Naming was the only area that correlated with instructional materials for Head Start children. There was no correlation found between early literacy and language activities and time with instructional materials for children in early childhood family education classrooms. The authors suggest that the early intervention of having materials available to children with speech-language disabilities and children in Head Start may have a large impact on early literacy growth.

Classroom features that expose children to print through labels, signs, posters, directions, and charts contribute to an environment that promotes early literacy and language (Clark & Kragler, 2005; Kliewer et al., 2004; Missall, McConnell, & Cadigan, 2006). In an ethnographic study of inclusive preschool classrooms serving typically developing children as well as children with severe disabilities, Kliewer et al. (2004) found that all children can become members of the literate community. The study sought to examine how literacy was fostered in these classrooms. One way that classrooms accomplished this was through experiences with print and writing materials. One specific example from the ethnography includes the use of environmental print to foster literacy. In one of the classrooms studied, rules are written and posted for all to see as a source of environmental print. During one day of the study, the lead teacher Shayne said there was a new rule of no fun at school. The children watched Shayne as she wrote the new rule on paper and posted it with the rest of the rules. A teaching assistant suggested to the children, who were opposed to this new rule, that if they did not agree with it they

needed to protest and told them that a real protest had signs saying what you were against. With poster board and crayons readily available to children, they got to work on creating protest signs that indicated how they felt about the new rule. Some children worked on their own while others worked with teachers to create posters disputing the new rule. Posters included statements of “Yes fun at school” and “No Shayne at school”. Along with written words, symbols were also included as one student drew a picture of a school with a circle around it and a slash through it. One child with severe physical disabilities watched all of the children creating their posters and was motivated to create her own poster. This example highlights how print can inspire and help to develop early literacy and language skills for children of varying ability levels. The current study is concerned with what particular features of the physical environment are associated with early literacy and language progress for children with disabilities.

Curriculum/Interactions with curriculum. Once the environment is taken into consideration, it is important to assess the possible early literacy and language curriculum experiences children may have when interacting with the environment (Clawson & Luze, 2008; Kliewer et al., 2004; Missall, McConnell, & Cadigan, 2006; Neuman, 1999; Roskos et al., 2008; Weikle & Hadadian, 2004). In a review of literature regarding children with disabilities and early literacy and language development, Weikle and Hadadian (2004) found that early experiences are crucial to literacy development for children with and without disabilities. However, they also reported that children with disabilities, more often than typically developing children, do not reach literacy targets. It is important to note that Weikle and Hadadian stated that all children, including

children with disabilities, have the ability to learn literacy skills to some extent, but need to engage in early literacy and language activities to do so. One area where Weikle and Hadadian focus their findings is literacy activities such as reading frequently to children, having books available to children, and modeling literacy activities.

How often teachers read to children may contribute to children's early literacy and language development. Recall the study by Neuman (1999), of the Books Aloud intervention where high-quality books were brought into low-income preschool classrooms. In this study, the researcher targeted centers for the intervention in and around Philadelphia that demonstrated economic need. Centers that served as the control were chosen based on similar child demographics to intervention centers and not already participating in a study. To begin, research assistants collected photographic evidence and conducted observations to get an understanding of how books were used in the classrooms. During the intervention, research assistants continued to observe classrooms as well as informally interview teachers and collect daily schedules to monitor change of book usage. Information on book reading activities was collected from teacher reports of how often they read to children because this was viewed as less intrusive by the project manager. Half of the children in the Books Aloud intervention were reported as being read to in a group setting 3-4 times per day compared to the control group of children where only 28% of children were read to in a group setting 3-4 times per day. When being read to individually, children in the Books Aloud group 37% were reported as being read to frequently whereas only 11% children in the control group were reported as being read to frequently. Teacher interactions were assessed using research assistant

observations. Both the intervention and control group teachers interacted with children during storybook reading, but again Books Aloud teachers interacted more frequently with children. Having higher quality books available to teachers may encourage them to read more to children and interact more with children while reading to them.

Children's experiences with books in the Books Aloud intervention also seemed to make a difference in child outcomes. Specific child outcomes related to early literacy and language that were measured included environmental print, letter name knowledge, concepts of print, vocabulary, concepts of writing, and concepts of narrative. Children in the Books Aloud intervention seemed to have a great interest in books, possibly as a result of the intervention. Teachers reported that 85% of children frequently looked at or read books on their own, 58% frequently asked to be read to, 66% frequently pretended to read, and 72% frequently asked questions about reading. Pre and post tests were conducted to see if children had grown in their early literacy and language skills as a result of being read to and exposure to books. Tests included six concepts: receptive vocabulary, concepts of print, environmental print, letter name knowledge, concepts of narrative, and concepts of writing. For all variables, children in the Books Aloud group made greater gains than children in the control group. Significantly greater gains were shown in concepts of print, letter name knowledge, concepts of writing, and concepts of narrative. Although children with disabilities were not included in the study as a subgroup, it stands to reason that it may be even more important for these children to be read to and have exposure to books as a means of early literacy and language development. However, being read to and exposure to books are not the only early literacy and

language curriculum experiences that are important to early literacy and language development.

The frequency with which children have the opportunity to use writing materials and the way in which the teacher uses the writing materials in learning activities may be another factor that contributes to children's early literacy and language development (Clark & Kragler, 2005). In a small study of thirty-four children, Clark and Kragler examined how integration of literacy materials into learning centers in the classroom affected low-income preschoolers in one year. This study included low-income children because they are considered at risk for literacy development delays. The authors did not report if there were any children with diagnosed disabilities in the sample. Some of the literacy materials included, but were not limited to, writing materials such as pencils, paper, chalk, dry erase boards, easels, and notebooks. The children in the study were in three different classrooms. One of the classrooms, the Apple room, only presented materials, but did not try to have children actively engage in using them. Another classroom, the Sunshine room, had more teacher-directed activities such as instructing the children how to draw with chalk. The third classroom, the Rainbow room, had both teacher-directed activities and spontaneous child-directed activities. Teachers in the Sunshine and Rainbow rooms volunteered to work with researchers to help children develop early literacy and language skills. From fall to spring, all classrooms added to the amount and variety of materials available to children. Children were assessed with the Test of Early Reading Ability II (TERA-II), which obtained a total score as well as three sub-scores for print (knowledge that print carries meaning, alphabet knowledge, and

conventions of print), a rhyming activity and writing samples. Results indicated that all children showed growth over time. The TERA-II results did not exhibit differences across classrooms on total scores, but did find differences across classrooms on the subtest of alphabet knowledge. For alphabet knowledge, children in the Rainbow room scored significantly higher than children in the Apple room. Only children in the Rainbow room demonstrated significant gains on the rhyming activity. With regards to writing, the number of children across all classrooms who could write their name doubled from 12 to 25. Other children were writing various words, letters, and drawing pictures. Along with formal TERA-II writing samples that were assessed, children in the Rainbow room were informally observed mimicking adults writing as well as drawing and writing stories not only in a writing center, but also in a science center. It is important to note that Clark and Kragler felt that it isn't sufficient to have materials accessible; teachers need to engage in teacher-directed literacy activities or children need to engage in spontaneous child-directed literacy activities for children to demonstrate growth in early literacy and language.

Exposing young children to literacy curriculum experiences, however, may not be enough. How often literacy curriculum experiences are modeled for children and the curriculum used may also contribute to children's early literacy and language development (Clark & Kragler, 2005; Hamre, Justice, Pianta, Kilday, Sweeney, Downer, & Leach, 2010; Roskos et al., 2008). Roskos et al. specifically chose to focus on vocabulary growth for typically developing children, children with disabilities, and children at risk for disabilities in order to evaluate whether children in the different

groups made comparable progress across different types of activities. Children from all three groups were exposed to the Doors to Discovery curriculum, which included three units. The three units focused on themes or topics that young children typically enjoy including *Vroom! Vroom!* (unit 1) centered on transportation, *Backyard Detectives* (unit 2) centered on nature, and *Tabby Tiger's Diner* (unit 3) centered on food and restaurants. In the study, each unit of the Doors curriculum was comprised of large-group time, discovery centers, and small-group time. All three areas included teacher modeling for how to interact with books and materials, as well as teachers modeling how to use vocabulary appropriately. Discovery centers were a time for children to explore various centers on their own; however, teachers were encouraged to model using certain vocabulary with children while they engaged in centers. Large and small-group time was more structured, but generally reflected a time when teachers modeled interacting with books for children and then allowed them to interact with books in some way. Differences between large and small-group time included the number of children, amount of time, and structure of the book being used during the specified time. In large-group time, books had the words included and children could read along and participate in "book talk". During this time, children were working on receptive language skills. In small-group time, books only included pictures and children were encouraged to use their expressive vocabulary to describe the pages and create their own story. Results indicated that all children increased in their receptive and expressive vocabularies through the Doors curriculum. Despite all children showing growth in receptive vocabulary, however, only typically developing children made significant gains. Even though growth

was not statistically significant, results indicated that children with disabilities produced higher receptive vocabulary scores in unit 3 than their at risk peers. As for expressive vocabulary, only children in the typically developing group made statistically significant growth. This research points to a need for better curriculum development for children with disabilities and at risk for disabilities. To address this issue we first must determine what early literacy and language curriculum experiences are associated with early literacy and language progress for children with disabilities. Once early literacy and language curriculum experiences are established, teachers need to be able to follow them.

Teachers' education and training. With various types of early care and education settings outside of the home, come various standards for teacher qualifications and practices. Some states have minimum education levels for pre-kindergarten teachers in place (NIEER, 2010; Saracho & Spodek, 2007). The National Institute for Early Education Research in their latest State Preschool Yearbook found that 26 states require lead teachers to have a Bachelor's degree in their state-funded pre-kindergarten program. Teachers' level of education has been a point of contention for preschool programs with some strongly supporting the need for a Bachelor's degree while other programs don't consider it a necessity. Previous research studies have been inconclusive as to how much of an impact teacher education has on children's development, with some indicating higher teacher educational qualifications are associated with more effective teaching practices and child outcomes, and other studies indicating that teachers' degree level may not be significantly associated with differences in the quality of teaching practices or child outcomes (Bryant et al., 1994; Early, Maxwell, Burchinal, Bender, Ebanks, Henry,

Iriondo-Pereze, Mashburn, Pianta, Alva, Bryant, Cai, Clifford, Griffin, Howes, Jeon, Peisner-Feinberg, Vandergrift, & Zill, 2007; Kelley & Camilli, 2007; Saracho & Spodek, 2007).

If children are in a preschool program where there is a highly qualified and high quality teacher preparing and carrying out lessons, then the impact could be long lasting and potentially lead to greater academic success throughout formal schooling. It is important, therefore, to take into account the education and training of teachers working with children because they may have the most direct impact on children's early literacy and language development. As mentioned above, there is some evidence that teachers with higher levels of education in fields related to child development provide higher quality instruction (Saracho & Spodek, 2007; Early et al., 2007). However, although there is some evidence that teachers with higher education levels provide generally higher quality care, the quality of the early literacy and language instruction they provide may vary. Teachers' education level may or may not be directly associated with the quality of early language and literacy instruction they provide. Justice, Mashburn, Hamre, and Pianta (2008) found that higher quality literacy instruction was present not when teachers had a higher education level, but when they had higher levels of self-efficacy. Therefore, teachers who feel highly confident in their abilities deliver higher quality literacy instruction. More education and professional development may contribute to more self-efficacy for teachers.

One way of potentially increasing the quality of teachers, regardless of education level, is through professional development. Professional development for teachers can

happen through conferences, workshops, class, coaching, or simply collaborating with colleagues. The goal of professional development for teachers is to increase their knowledge base in working with children (Cunningham, Zibulsky, and Callahan, 2009; Dickinson & Caswell, 2007; Podhajski & Nathan, 2005; Powell, Diamond, Burchinal, & Koehler, 2010). As more information is gathered through research on how children learn and best practices when working with children, teachers need to be kept abreast of changes and professional development provides that opportunity. Early literacy and language are often a focus of professional development because they are the basis for most of children's future learning.

One study by Dickinson and Caswell (2007) focused on increasing early childhood teachers' content knowledge through a professional development program called the Literacy Environment Enrichment Program (LEEP). The LEEP intervention was given in two three-day sessions over the course of five months. Teachers participating in LEEP had various education levels and years of experience. During LEEP, teachers were given information about how to incorporate literacy concepts and materials into classroom activities and were allowed to design and implement lessons as they wished. They found that simply providing teachers with materials and examples of how to bring literacy concepts into activities helped to effect the classroom environment. Even though teachers' knowledge of early literacy practices increased, however, there was no significant difference for children in the classrooms of LEEP participants. Although not a focus or goal of LEEP, the study found that teachers gained a lot from working with a supervisor. Other studies have implemented interventions that include a

mentor or coach and found positive effects for both teachers and the children in those teachers' classrooms (Podhajski & Nathan, 2005; Powell et al., 2010).

During many teacher education and training programs, use of certain curricula may be stressed as a means of guiding practice. Even though teachers may be following curriculum guidelines when designing and implementing lesson plans with preschool children, it is possible that the quality in how they are carried out is lacking (Hamre et al., 2010; Justice et al., 2008). Studies by Hamre et al. and Justice et al. examined how fidelity of curriculum implementation related to the quality of early literacy and language instruction. The curriculum being used in both studies was *My Teaching Partner—Language & Literacy Curriculum*. Both studies found that teachers were able to carry out lesson plans with high fidelity, but relatively low quality. The quality of interactions for teachers during lessons was assessed using the *Classroom Assessment Scoring System-Pre-K* (CLASS) in Hamre et al.'s study. Results from Hamre et al.'s study indicated that quality was low in Language Modeling and Literacy Focus. Hamre et al. found that in the classrooms where quality was high children made more gains, with the most gains being made when dosage (amount of time engaging in literacy related lesson) and quality were high. The *My Teaching Partner—Language & Literacy Curriculum* as a means of professional development for teachers of at risk preschoolers may be effective if quality of implementation is high.

Despite evidence that programs like LEEP and curricula like *My Teaching Partner—Language & Literacy Curriculum* are associated with positive outcomes, they

do not guarantee that teachers will be effective. It is still important to look at individual teachers and their practices when working with children.

Teacher practices. In addition to examining teachers' education and training, it is important to look specifically at the teaching practices that are associated with progress in children's literacy and language development. Research suggests that, teachers need to be cognizant of the language they are using around and with children and aware of their actions as these teaching practices may contribute to children's early literacy and language development (Bryant et al., 1994; Dickinson & McCabe, 2001; Gest et al., 2006; Justice et al., 2009; Kliever et al., 2004). Much of the research surrounding teacher language relies on information during story time or when teachers are reading a book to children. One study by Justice et al. (2009) specifically examined book reading style. Teachers in the experimental group used a print referencing style, while control teachers read as they normally would. The print referencing style was designed to help children pay more attention to and show more interest in books. Teachers using the print referencing style would ask questions about the print the book, comment on the print, and help children to follow the text by pointing to words. Results indicated that children in the print referencing group did make gains in early literacy and language skills, specifically print concept knowledge and alphabet knowledge.

It is important to investigate other verbal interactions apart from story time. Gest et al. (2006) investigated teacher talk not only during book reading, but also during free play and mealtime. In each of the three settings, book reading, free play, and mealtime, teachers used different styles of talk. During book reading teachers were more likely to

engage in talk that introduced new vocabulary and challenging concepts. When children were engaged in free play teachers used more pretend talk. Mealtimes were when teachers used the most decontextualized talk, which was talk about people, places, things, and events that were not present. It was suggested by Gest et al. that teachers should try to use all types of talk across all contexts in their classrooms to help children develop their early literacy and language skills.

The skill of using different types of talk may be even more important for teachers of children with disabilities. Take for example the ethnography by Kliwer et al. (2004). In their ethnography, Kliwer et al. observed classrooms where some children had very limited verbal abilities. One child used a computer to help her to speak beyond simple utterances and sign language. The teachers who were in the classroom with this child had to know how to communicate in ways that would make sense to the child and allow the child to communicate with them.

In addition to talking with children, other types of teacher practices can be related to children's early language and literacy development. In the study by Kliwer et al. (2004) discussed previously, is an example of how nonverbal interactions with children with disabilities may influence early literacy and language development. Recall the classroom where a new rule instigated a protest by the children and the children made signs. Some children worked on their own while others worked with teachers to create posters disputing the new rule. One student who had very limited mobility was able to communicate that she wanted to participate. A teacher worked with child by guiding her hand to create a poster that showed in writing how the child felt about the new rule. This

example highlights how teachers' interactions with children with disabilities may go beyond speaking and listening by including touch and movement to aid in developing early literacy and language skills. The teacher in this example was able to provide interactions to promote early literacy and language development; however, this may not always be happening in early childhood classrooms.

Timeframe of Child's Receipt of Services. In addition to considering the relationship between the quality of children's language and literacy experiences (i.e., the classroom environment, curriculum activities, and teaching practices), it is possible that factors related to the child him/herself may impact the degree to which he/she makes progress in an early care and education program. One such factor could be the timeframe within which the child's disability is recognized and addressed through specialized education services. Before it is possible for teachers to meet the needs of children with disabilities through individualized education plans (IEPs), the children must first be identified as having a disability. It is possible that with earlier identification of disabilities children will be better able to stay on course with typical literacy trajectories (Malone, McKinsey, Thyer, & Straka, 2000; Peterson et al., 2004; Steele, 2004; VanDerHeyden & Snyder, 2006). If children are observed and identified early, then there may be more time to develop and implement intervention strategies that are effective. Steele (2004) offers many ways that teachers can help children that they suspect may have a disability. Suggested strategies include a structured program with organized lessons and play opportunities as well as consistent teacher practices. Specifically related to early literacy and language skills teachers can clap out syllables, use finger plays,

incorporate songs into lessons, and read books that are of interest to the children. Earlier identification of a disability may mean the child's IEP can be implemented earlier.

Unfortunately there is some evidence to suggest that children with disabilities may not be identified and served in a timely manner. Peterson et al. in their study of Early Head Start found that of the almost 300 children diagnosed with a disability, roughly one third were receiving services under Part C of the Individuals with Disabilities Education Act (IDEA). Many more children were suspected to have a disability, but did not have a diagnosis. Timing of diagnosis may affect receipt of services and therefore children's language and literacy development may be impacted, which leads to another question. Do children who are diagnosed with a disability and have an IEP in place earlier benefit? For the current study, the question is whether children diagnosed with a disability in the fall make more progress than children diagnosed and have an IEP in the spring?

Bridges Study

To put the current study into perspective, it is important to present some significant findings from the original study's data. The South Carolina Bridges to Early Learning Project, from which the current study uses data, focused on an intervention of training only versus training with coaching for teachers to support in children's early literacy and language development. Teachers who received either Coaching or Training participated in professional development to implement the Opening the World of Learning (OWL) curriculum that concentrates on literacy and language development.

Teachers in the Coaching condition also received guidance from an expert coach in early childhood language and literacy.

First, the results for teachers will be presented. Findings indicated that the Bridges intervention had positive effects on teachers in both Coaching and Training groups. The area that demonstrated the greatest gains in quality on outcome measures was classroom environment, with small to moderate effects found for general classroom practices and teachers' language and literacy practices. It is important to note that there was not a significant difference between the progress teachers made in the Coaching group compared to the Training group.

Now, the results for children enrolled in Bridges participants' classrooms will be discussed. Something to keep in mind when considering results for the sample of children is that they come from a very disadvantaged population as indicated by a majority of them receiving free or reduced lunch. Overall, there was a lack of significant child outcomes with only a few differences found on measures of print and word awareness, beginning sounds awareness, and nursery rhyme awareness. For Beginning Sound Awareness, children in the Coaching group scored significantly higher than children in the Control group. On the Print and Word Awareness task, children in both the Coaching and Training groups scored significantly higher than children in the Control group. And for Nursery Rhyme Awareness, children in the Training group scored higher than children in both the Coaching and Control groups. It is important to note that the effect sizes on these results were small, with only the Nursery Rhyme Awareness effect being considered medium. With few differences found, it may be that children with

disabilities in these classrooms made less progress and, therefore, may be contributing to the limited evidence for differences between the groups on child outcomes.

CHAPTER III

RESEARCH QUESTIONS AND HYPOTHESES

The overall purpose of the current study is to explore factors that may play a role in the early literacy and language development of preschool aged children with disabilities. The following research questions and hypotheses will be examined:

Research Question 1. For children with disabilities, are classrooms that have physical environments that promote language and literacy, based on the ELLCO Literacy Environment Checklist and TBRS Centers scale, associated with higher levels of progress in vocabulary and early literacy skills?

Hypothesis 1. Physical aspects of classroom environments promote early literacy and language opportunities through the provision of books, writing materials, and environmental print. Therefore, I hypothesize that classrooms with physical environments that promote language and literacy, based on the ELLCO Literacy Environment Checklist and TBRS Centers scale, will be positively associated with early literacy and language skills for children with disabilities.

Research Question 2. For children with disabilities, are classrooms that have more frequent and higher quality early literacy and language curriculum experiences, based on the ELLCO and TBRS measure scores, associated with more progress in children's vocabulary and early literacy skills?

Hypothesis 2. It is hypothesized that classrooms with more frequent and higher quality early literacy and language curriculum experiences, as noted through ELLCO and TBRS scores, will be positively associated with progress children with disabilities make in early literacy and language skills.

Research Question 3. For children with disabilities, are teachers who exhibit higher quality teaching practices and interaction more often, based on TBRS scores, associated with higher levels of progress in vocabulary and early literacy skills?

Hypothesis 3. It is hypothesized that there will be a positive association between teachers' ratings on the TBRS and children's literacy and language progress.

Research Question 4.a. For children with disabilities, is there an association between teachers' level of education and children's progress in early literacy and language?

Hypothesis 4.a. It is hypothesized that teachers with higher degrees will have children with disabilities in their classrooms make more progress in early literacy and language skills.

Research Question 4.b. Is there an association between teachers' amount of professional development through the year and children's progress in early literacy and language?

Hypothesis 4.b. It is hypothesized that teachers who receive more in-service professional development have children in their classrooms make greater gains in early literacy and language skills

Research Question 5. Do children with an IEP in the fall make more progress on literacy and language development measures, PPVT-III and PALS PreK, than children with an IEP in the spring?

Hypothesis 5. It is hypothesized that children with an IEP in the fall will make more progress on literacy and language development measures, PPVT and PALS, than children with an IEP in the spring.

CHAPTER IV

METHODS

Background

The current study was conducted using secondary data from the South Carolina Bridges to Early Learning Project. As previously stated the Bridges project focused on an intervention of training and/or coaching for teachers to support in children's early literacy and language development. The intervention lasted for two years. Teachers were randomly assigned to one of three groups. One group consisted of teachers who received training to implement a specific curriculum that concentrates on early literacy and language skills. Another group received training for the same curriculum as well as coaching from an individual with an early childhood background. The final group is a control who received neither training nor coaching. As part of the study of the Bridges intervention with teachers, children were also assessed to determine if teachers who received more professional development had students who performed better on early literacy and language assessments. Within the training group and the control group, eight children were randomly selected to participate in the study. Within the coaching and training group, eight children were randomly selected for a complete battery of language and literacy measures and the remaining children in the classroom received an abbreviated version of the assessment battery. The Bridges Project was conducted over a two year time span; however the current study only uses data from the second year.

Bridges teachers. Originally, 118 teachers were included from Head Start settings, public school settings, and child care centers. Each setting included teachers in the training, coaching and training, or control groups. There were a total of 44 teachers (49.2%) that received training. Of these 44, 14 (31.8%) were in a public school setting, 22 (50.0%) were in a Head Start setting, and 8 (18.2%) were in a child care setting. Teachers that received coaching and training totaled 39 (35.6%), with 14 (35.9%) in a public school, 19 (48.7%) in a Head Start, and 6 (15.4%) in a child care. The remaining 35 teachers were in the control group with 14 (40.0%) in a public school, 17 (48.6%) in a Head Start, and 4 (11.4%) in a child care. The majority (87%) of teachers were Black/African American females. Remaining teachers identified themselves as either White/Caucasian (12.3%) or any other race/ethnic group (3%). The average age of teachers was just under 42 years of age (41.9). Educational levels ranged from GED to Master's Degrees. The majority of teachers had obtained either their high school diploma (21.5%), Associate's Degree (33.2%), or Bachelor's Degree (31.3%). Of the teachers who earned a degree, more than half specified that they majored in early childhood education.

Bridges children. In total, 746 children from the classrooms where teachers participated were included in the sample for the second year. Out of the 746 children, there were 735 children for whom complete data were available. There were 276 children assessed in classrooms where the teacher received training. In classrooms where teachers received training and coaching, there were 273 children. The number of children in the control group was 186. Of the children in the original sample, the majority

(82.8%) were Black/African American. The average age of all of the children was 53.9 months. Roughly half (48.4%) of the sample were male.

The current study uses data only from children who were identified as having a disability through indication of an Individualized Education Plan (IEP) by their teacher. Data from teachers of the children with disabilities were also used. The two sub-groups of the full sample that were used in this study are described below.

Sample

Current study child sample. Participants in the current study were selected based on disability status as reported by data collectors through teacher indication of IEP. Children with an IEP in either the fall or spring were included as potential participants for this study. After creating a database only including children with some indication of a disability, either through an IEP or noted special education services provided, 68 children were included. Due to missing data, 12 of the 68 children were eliminated from the sample, leaving a total of 56 children with IEPs for the current study. Demographic information for children with disabilities included in the total sample is presented in Table 1. In the fall, 21 children were identified as having an IEP. All of the 21 children who were identified as having an IEP in the fall continued to have an IEP in the spring. An additional 35 children were recognized as having a disability in the spring and had an IEP in place. The majority (76.8%) of children in the current sample received services for speech/language disabilities. A small percentage (3.6%) received services for visual impairments. The remaining 19.6% received services for various learning disabilities.

Table 1

Child Demographics for Total Sample of Children with Disabilities

Characteristic	<i>N</i>	Percentage
Gender		
Male	34	60.7%
Female	22	39.3%
Ethnicity		
Black/African American	47	83.9%
White/Caucasian	5	8.9%
Other racial/ethnic group	2	3.6%
Missing	2	3.6%
Fall IEP	21	37.5%
Spring IEP	56	100%
Mean Age	52.98	--

The majority (83.9%) of children in the total sample of children with disabilities were Black/African American. Children identified as White/Caucasian composed 8.9% of the current sample. A few children (3.6%) were classified as any other racial/ethnic group. The percentage of children for whom this information was missing is 3.6%. Over half (60.7%) of the sample was male. The average age of the children in the current sample was 52.9 months at the fall data collection period. Of the 56 children, 13 (23.2%) had teachers receiving training, 27 (48.2%) had teachers receiving coaching and training, and 16 (28.6%) had teachers in the control group. The children in the total sample of children with disabilities only represent the Head Start and public school settings with

51.8% being in Head Start programs and 48.2% in public school settings.

Children in the study were, in some cases, grouped without classrooms. In the data set, 12 of the 29 classrooms had only one child with disabilities with the remaining 17 classrooms having 2-5 children. Hierarchical modeling would be the preferable type of analysis in research studies where subjects are nested within groups (such as, in this case, multiple children within a teacher's classroom). These types of analyses were, however, not feasible given the small sample size. Therefore, correlations were chosen to address three research questions presented for this study. Because correlations are more suited towards one to one correspondence, one child from each classroom in which there were two or more children was randomly selected for analyses. For classrooms with two children, a coin was flipped to determine selection. Random selection for classrooms with three or more children was made by placing student identification numbers for each child enrolled in a single classroom into a hat and choosing one that would be included in the randomly selected sub-sample. These random selection procedures were repeated for each classroom that had more than one child enrolled. Demographic information for children included in the randomly selected sub-sample selected for the study, which includes all children from classrooms where only one child was enrolled plus the children who were randomly selected from classrooms with multiple participants, is presented in Table 2.

Table 2

Child Demographics for Randomly Selected Sub-Sample

Characteristic	<i>N</i>	Percentage
Gender		
Male	17	58.6%
Female	12	41.4%
Ethnicity		
Black/African American	25	86.2%
White/Caucasian	2	6.9%
Other racial/ethnic group	1	3.4%
Missing	1	3.4%
Fall IEP	11	37.9%
Spring IEP	29	100%
Mean Age	52.96	--

A large percentage of children (86.2%) in the randomly selected sub-sample were Black/African American. Children identified as White/Caucasian composed 6.9% of the randomly selected sub-sample. One child (3.4%) was classified as any other racial/ethnic group. There was one child (3.4%) for whom this information was not available. More than half (58.6%) of the randomly selected sub-sample was male. The average age of the children in the randomly selected sub-sample was 52.9 months. Of the 29 children in the randomly selected sub-sample, 7 (24%) had teachers receiving training, 13 (45%) had teachers receiving coaching and training, and 9 (31%) had teachers in the control group. The children in the randomly selected sub-sample only represent the Head Start and

public school settings with 58.6% being in Head Start programs and 41.4% in public school settings.

Current study teacher sample. Only the data from teachers of children with IEPs were examined. Of the 29 teachers who had children with IEPs in their classrooms, 7 received training, 13 received coaching and training and 9 were in the control group. Table 3 presents teacher demographics for the study. All teachers were female. There were 24 teachers for whom racial/ethnic data was available. Of the 24 teachers, 71% self-identified as Black/African American, 25% as White/Caucasian, and the remaining 4% as Multiracial. Seventeen teachers (59%) were in a Head Start setting. The remaining 12 teachers (41%) were in public school settings. With regards to number of years of experience teaching, the mean for teachers was 15.36 (SD=10.52) with a range of 0-43 years. All teachers, who reported their education, indicated that they at least had some college experience with the highest level of education being a Master's degree plus hours towards a Doctorate degree. Of the 24 teachers who indicated their education level, only 1 (3.4%) had some college, but did not earn a degree, 4 (13.8%) had an Associate's degree, 2 (6.9%) had an Associate's degree plus hours towards a Bachelor's degree, 8 (27.6%) had a Bachelor of Science or Bachelor of Arts degree, 4 (13.8%) had a Bachelor's degree plus hours towards a Master's degree, 4 (13.8%) had a Master's degree, and 1 (3.4%) had a Master's degree plus hours towards a Doctorate degree. The average number of students with disabilities that a teacher had in her classroom was 2 with the range being 1-5.

Table 3

Teacher Demographics

Characteristic	<i>N</i>	Percentage
Gender		
Male	0	
Female	29	100%
Ethnicity		
Black/African American	17	58.6%
White/Caucasian	6	20.7%
Multiracial	1	3.4%
Missing	5	17.2%
Education		
Through AA+	7	24.1%
BA/BS	8	27.6%
BS+	9	31%
Missing	5	17.2%
Mean Years Experience	15.36	--

Measures

Child measures. To determine the early literacy and language progress of children with disabilities, the Peabody Picture Vocabulary Test- Third Edition (PPVT-III) (Dunn & Dunn, 1997) and Phonological Awareness Literacy Screening Prekindergarten (PALS PreK) (Invernizzi, Sullivan, Meier, & Swank, 2004) assessments were employed. The PPVT and PALS measure early literacy and language development of children. The

information provided in Table 4 presents a brief overview of the instruments used to measure child outcomes.

Table 4*

Child Outcome Measures

Instrument Name	Primary Dimensions Measured	Internal Consistency
Peabody Picture Vocabulary Test- Third Edition (PPVT-III)	<ul style="list-style-type: none"> • Receptive vocabulary 	Internal consistency between .92 and .98; split-half between .86 and .97, test-retest between .91 and .94 (Dunn & Dunn, 1997)
Phonological Awareness Screening Prekindergarten (PALS PreK)	<ul style="list-style-type: none"> • Alphabet knowledge • Beginning sound awareness • Print and word awareness • Rhyme awareness • Nursery rhyme awareness • Name writing 	Internal consistency from .73 to .83 (Ivernizzi, Sullivan, Meier, & Swank, 2004)

**Adapted from Scott-Little & Brown, 2010*

Specifically, the PPVT-III, as noted in Table 4, examines children's receptive vocabulary by having children hear a word and identify the corresponding picture from a collection of pictures. Dunn and Dunn (1997, as cited by Scott-Little & Brown, 2010), found the PPVT-III to have an internal consistency between .92 and .98 with a split-half consistency between .86 and .97 and test-retest consistency between .91 and .94. The PALS PreK, presented in Table 4, was broken down into specific early literacy and language sections. The various sections assess children's early literacy and language development through alphabet knowledge (upper and lowercase), beginning sound awareness, print and word awareness, rhyme awareness, nursery rhyme awareness, and name writing. Observers have children complete tasks related to each early literacy and language area to determine development. Ivernizzi, Sullivan, Meier, and Swank (2004, as cited by Scott-Little & Brown, 2010) found the internal consistency of the PALS PreK to be from .73 to .83. Eight of the children in each classroom where the teacher received coaching and training were randomly selected for the full PALS PreK battery and the remaining children in the classroom only received the uppercase letter portion of the PALS PreK. Within the sample for the current study, 14 (25%) received the full PALS PreK battery and 42 (75%) received the abbreviated battery with just the PALS PreK uppercase letter task.

Classroom measures. Measures pertaining to the literacy environment, classroom curriculum, classroom practices and early literacy activities were used. To evaluate the literacy environment, classroom curriculum, classroom practices, and early literacy activities the Early Language and Literacy Classroom Observation (ELLCO) (Smith,

Dickinson, Sangeorge, & Anastasopoulos, 2002) was utilized. Another instrument, the Teacher Behavior Rating Scales (TBRS) (Landry, Swank, Smith, Assel, & Gunnewig, 2006), was used to determine classroom practices and early literacy activities.

Table 5*

Classroom Measures

Instrument Name	Primary Dimensions Measured	Internal Consistency
Early Language and Literacy Classroom Observation (ELLCO)	<ul style="list-style-type: none"> • Literacy environment • Classroom practices (general classroom practices as well as language and literacy practices) • Early literacy activities (book reading and writing) 	<p>Reliability from other studies:</p> <p>Internal consistency ranges from .66 to .90 for scales and .73 to .93 for subscales (Dickinson & Cashwell, 2007; Smith et al., 2002)</p> <p>Reliability with the Bridges sample:</p> <p>Reliability for the scales and subscales ranged from .705 to .999 for all scales and subscales</p>

Teacher Behavior Rating Scales (TBRS)	Language and Literacy Environment and General Preschool Quality <ul style="list-style-type: none"> • Book-reading practices • Oral language use by lead teacher • Phonological awareness activities • Print and letter knowledge • Written expression • General teaching behaviors • Teacher sensitivity 	Reliability from other studies: Internal consistency for subscales: .66 - .94 (Jackson et al., 2007; Landry et al., 2006) Reliability with the Bridges sample: Reliability for all scales and subscales ranged from .689 to .995
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**Adapted from Scott-Little & Brown, 2010*

The ELLCO, as shown in Table 5, rates general classroom environment features such as organization and content of the room as well as the environment of a classroom. The instrument is comprised of three separate scales: the Literacy Environment Checklist, the Literacy Activities Rating Scale, and the Classroom Observation Scale. The Literacy Environment Checklist includes items to rate the quality of the book area, book selection and use, writing materials, and writing around the room. Ratings of 1-5, with 1 being deficient to 5 being exemplary, are gathered through observation of the environment. The Literacy Activities Scale assesses literacy activities comprised of book reading and writing. Activities are rated by observers as either yes/no or 0-2 indicating total number (0 = 0, 1 = 1, and 2 = more) of times activities were observed. The Classroom

Observation Scale rates the general classroom environment as well as language, literacy, and curriculum on a 5 point scale (1- deficient to 5-exemplary). The reliability for all scales and subscales in the Bridges project ranged from .705 to .999 (Scott-Little & Brown, 2010). Dickinson and Cashwell (2007, as cited by Scott-Little & Brown, 2010) and Smith, Dickinson, Sangeorge, and Anastasopoulos (2002, as cited by Scott-Little & Brown, 2010) found internal consistency ranges for the ELLCO from .66 to .90 and from .73 to .93. The current study will specifically use the Literacy Environment Checklist and the Literacy Activities Rating Scale to determine aspects of the literacy environment, classroom curriculum, classroom practices and early literacy activities.

The TBRS, as described in Table 5, rates the environment, general teaching practices, and language and literacy teaching practices. Both quantity and quality of teaching practices were assessed with the TBRS. Typically a 3-point scale is used to evaluate quantity and usually a 4-point scale is used to gauge quality. All scales and subscales of the TBRS had reliability ranging from .695 to .995 in the Bridges study (Scott-Little & Brown, 2010). Jackson, et al. (2007, as cited by Scott-Little & Brown, 2010) and Landry, Swank, Smith, and Gunnewig (2006, as cited by Scott-Little & Brown, 2010) found internal consistency ranges for the TBRS from .55 to .94. Specific scales that will be used in the current study include: Centers, General Teaching Behaviors, Book Reading Behaviors, Print and Letter Knowledge, Written Expression, Phonological Awareness, and Oral Language Use with Students. A teacher survey was used to gather demographic data about teachers including gender and ethnicity. Other details about teachers were also collected through the survey including information about

their education and professional development.

Data Collection Procedures

Child data. Original data from the Bridges project were collected through assessment instruments as well as teacher input about each child's birth date, age, gender, ethnicity and IEP status. Parents of children enrolled at each research site were given a consent form to allow their child's participation in the study. Only children whose parents gave consent were assessed. Once consent was obtained, eight children from classrooms where the teacher was in a coaching, training or control group were randomly selected for a long assessment using a random number table. A long assessment included the PPVT-III and full PALS PreK. If there were eight children or fewer in a classroom, then all of the children were given a long assessment. Children in the coaching condition, if not randomly selected for the long assessment, were given a short assessment that included the PPVT-III and Uppercase Alphabet Knowledge from the PALS PreK.

Children's demographic data were collected by assessors the day that assessments were completed. Assessors filled out a cover sheet that was attached to the PPVT-III and PALS PreK protocols. Information about the child included, their name, teacher's name, school's name, birth date, gender, ethnicity, and child's first language. Classroom teachers sometimes provided assessors with a class list that indicated birth date, gender, and ethnicity. When information was not provided by the teachers in written form, assessors verbally confirmed information with teachers and recorded the information on

the cover sheet. These details about children were collected in both the fall and the spring.

The cover sheet also allowed assessors to indicate whether or not the child had an IEP. The data collector interviewed each teacher to determine each child's IEP status. If the child did have an IEP, then the data collector collected data from the teacher, on the type of disability. Type of disability was categorized into four groups including severe visual disability, severe hearing disability, speech/language disability, and other. Data collectors were able to indicate which type of disability by checking off all applicable to a particular child. There was no specific place to note what special education services were being provided, however some assessors included a description of the services the teacher reported that the child received.

Child assessment data were gathered through one-on-one evaluations with child assessors using the PPVT-III and PALS PreK instruments. Each of the assessors who conducted child assessments for this study had previously assessed children during the first year of the Bridges project, so they were all familiar with the instruments and the data collection procedures. Additional training was provided for child assessors during the second year of the project (the year that is the focus of this study). Training was provided over two days prior to both the fall and the spring data collection periods. The training included both review of information about the assessment and demonstrations of how to administer the assessment. Assessors also practiced completing measures while being observed by a master trainer. By the end of the two day training, each child assessor displayed proficiency on all measures. Child assessors completed fall

evaluations in the 2 to 12 weeks following the beginning of the program year and spring assessments were completed at least 6 months after the fall assessment.

The PPVT-III and PALS PreK were administered individually over two mornings lasting a total of about 40 minutes per child. First, the child assessor approached a child and confirmed the child's assent to go with her and complete the assessments. Then the assessor took the child to a separate, quiet location such as another classroom or media room, but sometimes had to complete assessments in the hallway due to lack of available space. During the first assessment session the assessor administered a brief drawing activity to give the child a chance to become acclimated to the testing situation, and then administered the PPVT and PALS uppercase letter task. If the child received the complete PALS PreK battery, the remainder of the tasks were administered during the second assessment session.

Classroom and teacher data. Classroom and teacher data were gathered through checklists, observations and teacher interviews. It is important to note that different persons complete the two types of assessments—child assessors did not collect data on classrooms and teachers. Each of the data collectors who completed the classroom observations for this study also conducted classroom observations the prior year, so each data collector had prior experience completing the measures. Before completing observations for this study, data collectors received training in all measures. A two-day training was provided in both the fall and the spring. In each training session, observers practiced rating video-taped teacher observations and then completed an observation of a video-taped teacher for purposes of establishing reliability of their ratings. Each of the

observers exhibited at least 80% reliability prior to collecting data. Fall observations took place in the 2 to 12 weeks following the beginning of the program year. Spring observations followed at least 6 months after fall observations.

The ELLCO and TBRS were completed together by the same data collector. Data collectors began the observation by completing the Literacy Environment Checklist of the ELLCO during morning routines such as arrival and breakfast. Completion of the Literacy Environment checklist typically took 15-20 minutes. The rest of the ELLCO and the TBRS were completed once the main activities of the day had begun. The TBRS focused heavily on teacher behaviors and was therefore completed throughout the observation. Both quantity and quality of teacher behaviors was recorded. The Literacy Activities Rating Scale was completed at the time the teacher conducting a book reading or writing activity. The remainder of the rating scales were completed at the end of the observation session. Typically, the observations for the ELLCO and TBRS took two to two and a half hours to complete.

The teacher interview portion of the ELLCO was completed after the classroom observation and took approximately 10-15 minutes.

Along with observations of teachers' teaching practices, teachers completed a survey to provide information about themselves. Teachers in the coaching and training groups completed the survey during the Summer Institute, which was an 18-hour long professional development opportunity provided at the beginning of the study. The teachers in the control group were sent a survey through postal mail and asked to return it in the same fashion.

Procedures for Preparing the Data Set

A sub-sample of the complete Bridges data set was used for this study. To create the database for this study, a copy of the original dataset was created and cases that did not indicate that a child had an IEP in the fall or spring were discarded. Once the data set only included children with an IEP in the fall or spring, a list of their corresponding teachers was generated through matching identification numbers. The matching of children to their teachers allowed for determining which classroom observation scores to include. When all children with IEPs and their teachers were secured, preliminary analyses were run. These analyses included frequencies to determine demographics of both children with IEPs and their corresponding teachers.

Analyses

All analyses were conducted using SPSS software (version 18). Preliminary analyses included frequencies and descriptives of classroom, teacher, and child data. Gain scores were calculated as a measure of children's progress from the fall to the spring. The children's gains scores were calculated by subtracting fall scores on the PPVT-III and PALS PreK from the spring scores on the same measures. Only the children who received a long assessment had scores for each subscale of the PALS PreK. Children who received the short assessment only had PPVT-III and PALS PreK Uppercase Knowledge scores. A major purpose of the analyses was to correlate children's gain scores with teachers' scores on measures of particular areas of interest. Specific analyses related to the research questions are as follows.

Research Question 1- For children with disabilities, are classrooms that have physical environments that promote language and literacy, based on the ELLCO Literacy Environment Checklist and TBRS Centers scale, associated with higher levels of progress in vocabulary and early literacy skills? Children's gain scores were included as a measure of language and literacy progress. The ELLCO Literacy Environment Checklist and TBRS Centers scale was included as measures for features of the physical environment that relate to language and literacy. A Pearson correlation was run to determine if better literacy and language environments are positively associated with children's progress. Children's gain scores were correlated with the ELLCO Literacy Environment Checklist and the TBRS Centers scale.

Research Question 2- For children with disabilities, are classrooms that have more frequent and higher quality early literacy and language curriculum experiences, based on the ELLCO measure scores, associated with more progress in children's vocabulary and early literacy skills? Children's gain scores were again included as a measure of language and literacy progress. The ELLCO Literacy Activities Rating Scale was included as a measure of curriculum experiences. Like Research Question 1, a Pearson correlation was run to determine if better early literacy and language curriculum experiences are positively associated with progress. In this case, children's gain scores were correlated with the ELLCO Literacy Activities Rating Scale.

Research Question 3- For children with disabilities, are teachers who exhibit higher quality teaching practices and interaction more often, based on TBRS scores, associated with higher levels of progress in vocabulary and early literacy skills? Again, children's

gain scores were included as a measure of language and literacy progress. The TBRS scales and subscales related to teacher practices were included as a measure of teacher practices. To determine if teacher practices are positively associated with children's progress, a Pearson correlation was run. Here, children's gain scores were correlated with the TBRS General Teaching Behaviors Sensitivity subscale, Book Reading Behaviors scale, Print and Letter Knowledge scale, Written Expression scale, Phonological Awareness scale and Oral Language Use with Students scale.

Research Question 4a- For children with disabilities, is there an association between teachers' level of education and children's progress in early literacy and language? To measure children's language and literacy progress, gain scores were used. Teacher's indication of level of education on teacher survey was used to measure level of education. An ANOVA was run to determine if children who have teachers with a higher level of education make more language and literacy progress.

Research Question 4b- Is there an association between teachers' amount of professional development through the year and children's progress in early literacy and language? Children's gain scores were utilized again as a measure of language and literacy progress. Teachers' total number of hours of professional development completed during the year (both Bridges trainings and other trainings) was used to measure professional development. A Pearson correlation was run to determine if children who have teachers who receive more professional development make more language and literacy progress. Children's gain scores were correlated with teachers' hours of professional development.

Research Question 5- Do children with an IEP in the fall make more progress on literacy and language development measures, PPVT-III and PALS PreK, than children with an IEP in the spring? A t-test for two independent samples was run to determine whether children who are diagnosed earlier and have an IEP in the fall make more progress than children who do not have an IEP in the fall, but do have an IEP in the spring. The samples are considered independent because children are in specific groups based on when their IEP was first indicated. A t-test was run on PPVT-III scores and another t-test was run on PALS PreK scores.

CHAPTER V

RESULTS

Preliminary Analyses

The statistical software used for all analyses was SPSS (version 18). Preliminary analyses included running frequencies for child and teacher demographic information that was presented in the methods. Descriptive statistics were run for all child and teacher measures.

Child Measures Descriptives. The child measures included in Table 6 are children's PPVT Standard score and PALS scores broken down by subscales for the total sample of children with disabilities. Children's mean PPVT scores increased from Fall (81.10, SD=17.71) to Spring (87.58, SD=13.16). An increase from Fall to Spring was also evident among mean PALS scores. Upper Case Letter Recognition (Fall=7.12, SD=8.96; Spring=15.36, SD=10.03), Lower Case Letter Recognition (Fall=17.88, SD=5; Spring=21.56, SD=4.34), and Letter Sounds (Fall=6.50, SD=9.10; Spring=10.22, SD=9.05) were the three subscales where children's scores increased the most.

Table 6

Child Measures for the Total Sample of Children with Disabilities

Measure	N	Fall		N	Spring	
		Mean (SD)	Range		Mean (SD)	Range
PPVT-III Standard Score PALS PreK	51	81.10 (17.71)	40-121	53	87.58 (13.16)	53-121
Upper Case Letter Recognition	51	7.12 (8.96)	0-26	53	15.36 (10.03)	0-26
Lower Case Letter Recognition*	8	17.88 (5)	0-26	18	21.56 (4.34)	12-26
Letter Sounds*	8	6.50 (9.10)	0-22	18	10.22 (9.05)	0-24
Name Writing	40	2.58 (1.99)	0-7	39	4.97 (1.71)	0-7
Beginning Sound Awareness	39	1.13 (2.24)	0-9	39	2.82 (3.57)	0-10
Print and Word Awareness	39	3.08 (2.78)	0-10	39	4.79 (2.40)	0-9
Rhyme Awareness	39	2.69 (2.27)	0-10	39	4.54 (2.38)	0-10
Nursery Rhyme Awareness	39	2.85 (2.53)	0-10	39	4.72 (2.87)	0-10

**Low N due to children not receiving full battery or not scoring high enough on Upper Case or Lower Case portion of test.*

Many of the analyses conducted required the use of children’s gain scores on the PPVT and PALS. Table 7 presents the mean, standard deviation, and range of children’s gain PPVT Standard scores and PALS scores broken down by subscales.

Table 7

Child Measures Gain Scores for the Total Sample of Children with Disabilities

Measure	N	Gain Scores	
		Mean (SD)	Range
PPVT-III Standard Score	49	6.57 (11.84)	(-19)-33
PALS PreK			
Upper Case Letter Recognition	48	7.69 (7.81)	(-2)-26
Lower Case Letter Recognition*	7	6.29 (4.50)	(-1)-11
Letter Sounds*	7	7.14 (8.92)	(-2)-22
Name Writing	37	2.35 (2.06)	(-2)-7
Beginning Sound Awareness	37	1.70 (3.79)	(-6)-10

Print and Word Awareness	37	1.84 (2.46)	(-3)-7
Rhyme Awareness	37	1.95 (2.07)	(-2)-6
Nursery Rhyme Awareness	37	2.05 (2.40)	(-3)-6

**Low N due to children not receiving full battery or not scoring high enough on Upper Case or Lower Case portion of test.*

As described in the methods section, a sub-sample of children with disabilities was randomly selected for the analyses. Once a randomly selected sub-sample was established for the current study, descriptive statistics were once again run for all child measures and are presented in Table 8. Randomly selected sub-sample children's mean PPVT scores increased from Fall (82, SD=17.43) to Spring (90.35, SD=13.15). Children in the randomly selected sub-sample also saw an increase from Fall to Spring on the same PALS scores as the whole sample including Uppercase Alphabet Knowledge (Fall=6.67, SD=7.75; Spring=14.62, SD=9.68), Lowercase Alphabet Knowledge (Fall=14.25, SD=2.87; Spring=20.22, SD=5.24), and Letter Sound Awareness (Fall=2.00, SD=2.16; Spring=8.33, SD=7.04).

Table 8

Randomly Selected Sub-Sample Child Measures

Measure	Fall			Spring		
	N	Mean (SD)	Range	N	Mean (SD)	Range
PPVT-III Standard Score	27	82 (17.43)	40-112	26	90.35 (13.15)	56-121
PALS PreK						
Uppercase Alphabet Knowledge	27	6.67 (7.75)	0-23	26	14.62 (9.68)	0-26
Lowercase Alphabet Knowledge*	4	14.25 (2.87)	10-16	9	20.22 (5.24)	12-26
Letter Sound Awareness*	4	2.00 (2.16)	0-5	9	8.33 (7.04)	0-19
Name Writing	21	2.81 (2.44)	0-7	19	4.89 (1.63)	2-7
Beginning Sound Awareness	20	.70 (1.26)	0-4	19	2.95 (3.81)	0-10
Print and Word Awareness	20	2.85 (2.62)	0-10	19	5.05 (2.72)	0-9
Rhyme Awareness	20	2.50 (2.26)	0-6	19	4.95 (2.48)	0-10
Nursery Rhyme Awareness	20	2.90 (2.36)	0-9	19	5.05 (2.92)	0-10

**Low N due to children not receiving full battery or not scoring high enough on Upper Case or Lower Case portion of test.*

Along with descriptive Fall and Spring scores on child measures for the randomly selected sub-sample, PPVT and PALS gain scores were also calculated for the randomly selected sub-sample and are shown in Table 9. These gain scores were used in correlational analyses for research questions 1-3 for the current study.

Table 9

Randomly Selected Sub-Sample Child Measures Gain Scores

Measure	N	Gain Scores	
		Mean (SD)	Range
PPVT-III Standard Score	25	9.80 (10.06)	(-8)-33
PALS PreK			
Uppercase Alphabet Knowledge	24	8.17 (6.57)	(-2)-23
Lowercase Alphabet Knowledge*	3	10.33 (1.16)	9-11
Letter Sound Awareness*	3	8.67 (7.23)	4-17
Name Writing	18	2.06 (2.18)	(-1)-6
Beginning Sound Awareness	18	2.50 (4.03)	(-3)-10

Print and Word Awareness	18	2.56 (2.68)	(-3)-7
Rhyme Awareness	18	2.56 (2.15)	(-2)-6
Nursery Rhyme Awareness	18	2.39 (2.52)	(-2)-6

**Low N due to children not receiving full battery or not scoring high enough on Upper Case or Lower Case portion of test.*

To determine if the children in the randomly selected sub-sample were equivalent to children not included in the randomly selected sub-sample a t-test was run on children's age and chi-square cross tabulations were conducted for gender and ethnicity. Descriptive statistics for the age of children in the randomly selected sub-sample demonstrated a mean of 52.96 months (SD= 5.31). The children who were not selected had a mean age of 53 months (SD= 4.50). For children's age, the t-test concluded that the difference in groups was not statistically significant, $t(50) = -.026, p > .05$. Cross tabulations also indicated that groups were not significantly different in terms of gender, $\chi^2(1, N=29) = .111, p = .74$, and ethnicity, $\chi^2(2, N=29) = .318, p = .85$.

Teacher Measures Descriptives. The descriptive statistics for teacher measures are presented in Table 10. Only the Literacy Environment Checklist and Literacy Activities Rating Scale were used from the ELLCO. From the TBRBS, results for the Centers scale, General Teaching Behaviors Sensitivity subscale, Book Reading Behaviors scale, Print and Letter Knowledge scale, Written Expression scale, Phonological Awareness scale and Oral Language Use with Students scale are shown. Not presented

in Table 10 are teachers' hours of professional development and level of education. The mean number of hours of professional development for the twenty-four teachers was 36.32 (SD= 28.95, range 0-135). In terms of teachers' level of education, 24.1% had up to an Associate's Degree, 27.6% obtained a Bachelor's Degree and 31% had taken courses beyond their Bachelor's Degree.

Table 10

Teacher Measures

Measure	N	Mean (SD)	Range
ELLCO			
Literacy Environment Checklist	29	32.03 (8.42)	9-41
Literacy Activities Rating Scale	29	9.48 (1.77)	5-12
TBRS			
Centers- Quality	29	3.17 (.83)	1.00-4.00
Sensitivity- Quantity	29	2.70 (.39)	1.67-3.00
Sensitivity- Quality	29	3.50 (.64)	1.75-4.00
Book Reading Behaviors- Quantity	29	2.33 (.44)	1.40-3.00
Book Reading Behaviors- Quality	29	2.87 (.77)	1.43-4.00

Print and Letter Knowledge- Quality	29	2.97 (.94)	1.00-4.00
Written Expression- Quality	29	2.67 (1.02)	1.00-4.00
Phonological Awareness- Quality	27	1.44 (.38)	1.00-2.29
Oral Language Use with Students- Quantity	29	2.49 (.46)	1.57-3.00
Oral Language Use with Students- Quality	29	3.22 (.71)	1.86-4.00

Results from these preliminary analyses were used to address research questions and hypotheses for the current study.

Results

The first three research questions presented in the current study were analyzed through correlations of the randomly selected sub-sample created from the total sample of children with disabilities. These correlations specifically examined features of the children's classroom environment, as well as early language and literacy curriculum experiences and teacher practices and interactions with children with disabilities. Additionally, teachers' level of education, as it relates to children with disabilities progress in language and literacy development, was tested with analysis of variance (ANOVA). Along with examining teachers' level of education, their professional development was also taken into account and analyzed by correlating teachers' hours of

professional development and children with disabilities gain scores on the PPVT and PALS measures. A final analysis was conducted by comparing children's time of special education services being implemented and progress in language and literacy through a t-test.

Research Question 1. For children with disabilities, are classrooms that have physical environments that promote language and literacy associated with higher levels of progress in vocabulary and early literacy skills?

Hypothesis 1. Classrooms with physical environments that promote language and literacy will be positively associated with early literacy and language skills for children with disabilities.

Table 11

Correlations for ELLCO Literacy Environment Checklist and TBRS Centers Scale with Children's Gain Scores on PPVT and PALS

Measure	ELLCO Literacy Environment Checklist	TBRS Centers Scale
PPVT-III	-.060	-.126
PALS PreK Uppercase	.245	.234
PALS PreK Lowercase***	-.277	1.00**

PALS PreK		
Letter sound	-.952	.559
PALS PreK		
Name Writing	-.065	-.252
PALS PreK		
Beginning sound	.375	.292
PALS PreK		
Print and word	.134	.158
PALS PreK		
Rhyme	-.036	.248
PALS PreK		
Nursery Rhyme	-.154	-.006

***. Note that *n* for this variable is 3 cases.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Given the empirical evidence presented earlier, I hypothesized that the quality of children's physical environment would be related to their progress on early language and literacy development. Results show that children's PPVT gain scores and some PALS gain scores were not significantly related to most measures of the quality of the classroom environment. Some correlations indicated an inverse association with ELLCO scores, meaning that as physical environments improved children's progress sometimes decreased, but none of these correlations were statistically significant. Only one significant correlation was noted. The TBRSCenters scale had a significant positive association with children's PALS Lowercase Alphabet Knowledge gain scores, suggesting that high quality centers in a classroom are associated with gains in children's

language and literacy development. It is important to note, however, that the number of children included in this analysis ($n = 3$) was quite small and that there was limited variation in the children's scores on the PALS Lowercase Alphabet Knowledge gain scores and on their teachers' TRBS Centers scores. Correlations with PALS Letter Sound Awareness appear to be stronger than other measures, but were not found to be statistically significant.

Research Question 2. For children with disabilities, are classrooms that have more frequent and higher quality early literacy and language curriculum experiences associated with more progress in children's vocabulary and early literacy skills for children with disabilities?

Hypothesis 2. Classrooms with more frequent and higher quality early literacy and language curriculum experiences will be positively associated with progress children with disabilities make in early literacy and language skills.

Table 12

Correlations for ELLCO Literacy Activities Rating Scale with Children's Gain Scores on PPVT and PALS

Measure	ELLCO Literacy Activities Rating Scale
PPVT-III	.027
PALS PreK Uppercase	.168

PALS PreK Lowercase***	1.00**
PALS PreK Letter sounds	.559
PALS PreK Name Writing	-.071
PALS PreK Beginning sounds	.372
PALS PreK Print and word	.369
PALS PreK Rhyme	.265
PALS PreK Nursery Rhyme	-.151

***. Note that *n* for this variable is 3 cases.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Similar to the results for children with disabilities language and literacy development and physical environment, literacy activities were not found to have a significant association between children's vocabulary and most of the PALS subscales. When looking at the results of the correlation between children's gain scores and ELLCO Literacy Activities Ratings Scale scores, generally there is a positive association, although non-significant ($p < .05$). The results for PALS Name Writing and Nursery Rhyme Awareness are also non-significant; however, these two subscales demonstrate an inverse relationship with Literacy Activities Rating Scale scores. Again, we see that children's Lowercase Alphabet Knowledge gain scores and literacy activities are strongly

correlated, $r(1) = 1.0$, $p < 0.01$, which is a somewhat irregular result perhaps because of the small sample size for this measure ($n = 3$) and the limited variation in both the children's scores and the teachers' scores on these measures.

Research Question 3. For children with disabilities, are teachers who exhibit higher quality teaching practices and interaction more often, based on TBRS scores, associated with higher levels of progress in vocabulary and early literacy skills?

Hypothesis 3. Findings will indicate that there is a positive association between teachers' ratings on the TBRS and children's literacy and language progress.

We see in Table 13 that results indicate that a few of the measures of teachers' practices and interactions with children with disabilities have significant positive relationships with some of children's gain scores. Once again Lowercase Alphabet Knowledge gain scores was positively associated with measures of teachers' practices, in this case with TBRS Print and Letter Knowledge, Written Expression, Phonological Awareness and Oral Language Use with Children scales. As in previous analyses, the correlation may be somewhat irregular due to the small sample size for this measure. Children's Letter Sound Awareness was found to have a significant association with teachers' Sensitivity--Quantity ($r = -.998$, $p < 0.01$) and the quantity and quality of teachers' book reading behaviors ($r = .998$, $p < 0.01$). Other children's gain scores that were determined to have significant associations with teachers' practices and interactions with children with disabilities included PALS Beginning Sound Awareness and Print and Word Awareness.

Gain scores for PALS Beginning Sound Awareness significantly correlated with TBRS Written Expression ($r = .660, p < 0.01$), Phonological Awareness ($r = .566, p < 0.05$) and Oral Language Use with Children (quantity $r = .484, p < 0.05$, quality $r = .539, p < 0.05$). Children's gain scores for PALS Print and Word Awareness correlated with TBRS Written Expression ($r = .487, p < 0.05$). The TBRS variables included in these analyses were inversely associated with PPVT and PALS Name Writing gain scores, although none were found to be significant.

Table 13

Correlations for TBRS Scales with Children's Gain Scores on PPVT and PALS

Measure	Sensitivity Quantity	Sensitivity Quality	Book Reading Quantity	Book Reading Quality	Print and Letter Knowledge Quality	Written Expression Quality	Phonological Awareness Quality	Oral Language Use With Students Quantity	Oral Language Use With Students Quality
PPVT-III	-.063	-.142	-.217	-.252	-.082	-.116	-.077	-.185	-.223
PALS PreK Uppercase	.272	.163	.004	.113	.272	.259	.182	.248	.206
PALS PreK Lowercase***	-.500	. ^a	.500	.500	1.00**	1.00**	1.00**	1.00**	1.00**
PALS PreK Letter sounds ***	-.998*	. ^a	.998*	.998*	.559	.559	.559	.559	.559
PALS PreK Name Writing	-.090	-.099	-.006	-.116	-.359	-.384	-.195	-.172	-.068
PALS PreK Beginning sounds	.274	.235	.361	.432	.331	.660**	.566*	.484*	.539*
PALS PreK Print and word	.216	.250	.150	.203	.187	.487*	.269	.276	.287
PALS PreK Rhyme	.183	.298	.273	.226	-.015	.330	.055	.039	-.038
PALS PreK Nursery Rhyme	-.274	-.209	.019	.024	.134	.073	-.042	.038	.219

***. Note that n for this variable is 3 cases.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

a. Analyses could not be completed because of insufficient number of cases.

Research Question 4a. For children with disabilities, is there an association between teachers' level of education and children's progress in early literacy and language?

Hypothesis 4a. Teachers with higher degrees will have children with disabilities in their classrooms make more progress in early literacy and language skills.

Children's progress in language and literacy development was not significantly related to teachers' level of education. The mean scores for children's gain scores on the PPVT by teachers' level of education is presented in Table 14a and results of analysis of variance are presented in Table 14b.

Table 14a

Children's PPVT Gain Scores by Teachers' Level of Education

<i>Level of Education</i>	<i>Mean</i>	<i>N</i>	<i>Std. Deviation</i>
Associate's Degree and Below	5.42	12	11.88
Bachelor's Degree	11.91	11	10.01
Bachelor's Degree and Beyond	4.26	19	13.25

Table 14b

Analysis of Variance

<i>Source</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Prob.</i>
Between Groups	430.609	2	215.305	1.469	.243
Within Groups	5715.510	39	146.552		
Total	6146.119	41			

Although there is a difference between the children's mean PPVT gain scores, particularly between children enrolled with teachers with a Bachelor's Degree and teachers with no higher education up to an Associate's Degree or teachers with a Bachelor's Degree plus more schooling, the difference is not statistically significant ($F(2, 39) = 1.469$).

PALS Uppercase Alphabet Knowledge score yielded similar results where teachers with a Bachelor's degree had students with mean gain scores ($M=10.09$, $SD=8.78$, $n=11$) exceeding those of other teachers (Associate's Degree and Below: $M=5.08$, $SD=6.87$, $n=12$; Bachelor's Degree and Beyond: $M=8.67$, $SD=8.47$, $n=18$). The difference between the groups was not, however, significant, $F(2, 38) = 1.197$. Children's gain scores for PALS Lowercase Alphabet Knowledge and Letter Sound Awareness were only available for teachers with an Associate's Degree and below or a Bachelor's Degree and beyond (for PALS Lowercase: Associate's Degree and Below: $M=5.00$, $SD=5.29$, $n=3$; Bachelor's Degree and Beyond: $M=8.67$, $SD=4.04$, $n=3$; for PALS Letter Sound: Associate's Degree and Below: $M=2.67$, $SD=2.31$, $n=3$; Bachelor's Degree and Beyond: $M=6.67$, $SD=9.61$, $n=3$), neither of which were found to be significant differences (for PALS Lowercase: $F(1, 4) = .910$; for PALS Letter Sound: $F(1, 4) = .491$). Teachers with a Bachelor's Degree did not have children in their classrooms that were assessed on PALS Lowercase Alphabet Knowledge and Letter Sound Awareness measures. Children with teachers in the three education level groups also didn't vary significantly in terms of PALS Name Writing gain scores (Associate's Degree and Below: $M=2.40$, $SD=1.58$, $n=10$; Bachelor's Degree: $M=1.86$, $SD=2.67$,

$n=7$; Bachelor's Degree and Beyond: $M=2.31$, $SD=1.89$, $n=13$; $F(2, 27) = .167$). With regards to PALS Beginning Sound Awareness, we see yet another nonsignificant difference; however, the differences between the group means is somewhat larger than on the variables described above. Tables 15ab present the means for Beginning Sound Awareness (a) and analysis of variance (b).

Table 15a

Children's PALS Beginning Sound Awareness Gain Scores by Teachers' Level of Education

<i>Level of Education</i>	<i>Mean</i>	<i>N</i>	<i>Std. Deviation</i>
Associate's Degree and Below	.50	10	2.12
Bachelor's Degree	.14	7	1.77
Bachelor's Degree and Beyond	3.08	13	4.91

Table 15b

Analysis of Variance

<i>Source</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Prob.</i>
Between Groups	55.186	2	27.593	2.139	.137
Within Groups	348.280	27	12.899		
Total	403.467	29			

In Table 15a, we see a difference between the children's mean scores whose teachers have a Bachelor's Degree and Beyond and children's mean scores whose teachers do not have a Bachelor's Degree and Beyond. The difference, however, is not

statistically significant, $F(2, 27) = 2.139$. For Print and Word Awareness, we see a similar trend of children enrolled with teachers with Bachelor's Degree and Beyond having higher mean scores on the measure (Associate's Degree and Below: $M=1.50$, $SD=2.32$, $n=10$; Bachelor's Degree: $M=1.29$, $SD=2.14$, $n=7$; Bachelor's Degree and Beyond: $M=2.54$, $SD=3.07$, $n=13$), but still not to the point of significance ($F(2, 27) = .681$).

In terms of Rhyme Awareness, the children's mean scores for the three groups are very similar (Associate's Degree and Below: $M=2.00$, $SD=2.21$, $n=10$; Bachelor's Degree: $M=2.14$, $SD=2.41$, $n=7$; Bachelor's Degree and Beyond: $M=1.85$, $SD=1.86$, $n=13$) and are not significantly different ($F(2, 27) = .047$). The final dependent variable examined once again provided nonsignificant results. For Nursery Rhyme Awareness, children's scores for teachers with a Bachelor's Degree and Beyond were different from children enrolled with other teachers (Associate's Degree and Below: $M=1.50$, $SD=2.01$, $n=10$; Bachelor's Degree: $M=1.57$, $SD=2.23$, $n=7$; Bachelor's Degree and Beyond: $M=2.69$, $SD=2.98$, $n=13$), but not significantly ($F(2, 27) = .779$). Overall, teachers with a Bachelor's Degree or more had children in their classrooms make greater gains, although not significantly greater, than children whose teachers' highest level of education was an Associate's Degree.

Research Question 4b. Is there an association between teachers' amount of professional development through the year and children's progress in early literacy and language?

Hypothesis 4b. Findings will indicate that teachers who receive more in-service professional development have children in their classrooms make greater gains in early literacy and language skills.

Table 16

Correlations for Teachers' Hours of Professional Development with Children's Gain Scores on PPVT and PALS

Measure	Teachers' Professional Development
PPVT-III	.178
PALS PreK Uppercase	-.145
PALS PreK Lowercase	-.137
PALS PreK Letter sound	.537
PALS PreK Name Writing	-.034
PALS PreK Beginning sound	.130
PALS PreK Print and word	-.032
PALS PreK Rhyme	.183
PALS PreK Nursery Rhyme	-.105

Results in Table 16 show that, contrary to the hypothesis, teachers' number of hours spent in professional development does not significantly correlate with children's gain scores. A few positive correlations were indicated for children's Letter Sound Awareness, Beginning Sound Awareness and Rhyme Awareness, but none statistically significant. The remaining variables, Uppercase and Lowercase Alphabet Knowledge, Name Writing, Print and Word Awareness and Nursery Rhyme Awareness, were found to have nonsignificant but inverse correlations with teachers' hours of professional development.

Research Question 5. Do children with an IEP in the fall make more progress on literacy and language development measures, PPVT-III and PALS PreK, than children with an IEP in the spring?

Hypothesis 5. Children who begin receiving special education services in the Fall will make more progress in early literacy and language skills.

Table 17

T-test for Significance Differences in Gain Scores Between Children Whose IEPs Were Implemented at Different Times

	IEP Implementation		<i>t</i>	<i>df</i>
	Fall (n = 21)	Spring (n = 35)		
PPVT-III	12.11 (10.95)	3.70 (11.31)	2.524**	46

PALS PreK Uppercase	5.56 (6.11)	9.28 (8.49)	-1.615	45
PALS PreK Lowercase*	7.00 (4.00)	6.33 (6.43)	.152	4
PALS PreK Letter sound*	9.00 (11.53)	8.33 (7.51)	.084	4
PALS PreK Name Writing	2.38 (2.29)	2.39 (1.99)	-.009	34
PALS PreK Beginning sound	2.54 (3.99)	1.57 (3.42)	.772	34
PALS PreK Print and word	1.31 (1.49)	2.30 (2.75)	-1.204	34
PALS PreK Rhyme	2.31 (2.39)	1.78 (1.93)	.719	34
PALS PreK Nursery Rhyme	1.46 (2.18)	2.61 (2.25)	-1.484	34

Note. **= $p = .015$, *= n for this variable is 3 cases. Standard Deviations appear in parentheses below means.

Results from the t-test comparing children's gain scores on the PPVT and PALS measures indicate that the timing of special education services may be important to early

literacy and language development. There is a significant difference in PPVT scores for children who had Individualized Education Plans (IEPs) in place in the fall when compared to the spring. Children with IEPs in the fall had a mean PPVT gain score of 12.11 (10.95 SD), whereas children with an implementation of an IEP in the spring had a mean gain score of 3.70 (11.31 SD) ($t(46) = 2.524, p < 0.01$). No other statistically significant differences were found between children's IEP implementation and PALS gain scores.

CHAPTER VI

DISCUSSION

A majority of the research surrounding early literacy and language development for preschool-aged children deals with typically developing children. The current study sought to explore the extent to which certain factors associated with early care and education settings were related to early literacy and language development for children with disabilities. Of particular interest was the physical environment within which the children were in, early literacy curriculum experiences children were exposed to, teacher education, teacher practices and interactions, and the time period within which children with disabilities had an IEP put into place. Despite results from the analyses conducted being mostly nonsignificant, a few factors were found to be related to early literacy and language growth, including teacher practices and timing of IEP implementation. Although the current study didn't yield many significant results, issues it explored may be important to consider for future research.

Physical Environment Related to Early Literacy and Language Development

Recall the importance of the environment in which a child is growing and developing as Bronfenbrenner suggests with the concept of contexts. In the microsystem context of the preschool classroom, children have the potential to engage in proximal processes that influence development. The study by Neuman (1999) which took place in preschool classrooms, focused on providing children with more access to books and

created an inviting physical environment by adding pillows and rugs to reading areas found that the Books Aloud intervention had positive effects on children. However, Neuman cautioned that simply exposing children to books may not be enough. Results from the correlations of ELLCO Literacy Environment Checklist and TBRS Centers scale with children's gain scores on PPVT and PALS measures suggest that Neuman's caution may be valid. Only one significant finding was determined from the analyses. The TBRS Centers scale and children's PALS Lowercase Alphabet Knowledge gain scores were found to be positively correlated. Although this is the kind of result to hope for, it has to be viewed cautiously because the number of children who were tested on lowercase letter recognition was extremely small.

Another interesting finding, although not significant, is that of the inverse relationship between the ELLCO Literacy Environment Checklist and a number of the child measures relating to vocabulary, Lowercase Alphabet Knowledge, Letter Sound Awareness, Name Writing and Rhyme Awareness. One could argue that the limited evidence for a positive relationship between the environment and some of these variables is somewhat reasonable given that things like sounds and rhymes cannot be seen in the environment. However, variables relating to vocabulary, letter knowledge and name writing should be reinforced through the environment with signs, written word and certain materials as they are in the classroom. Recall from Kliewer et al (2004) that even children with severe disabilities were able to draw from visual signs, posters, and rules posted in their environment to exhibit early literacy skills. They created their own signs and posters with a combination of letters and symbols and participated in a classroom

protest. Overall, the findings from the correlations do not support the hypothesis that classrooms that have physical environments that promote language and literacy, based on the ELLCO Literacy Environment Checklist and TBRS Centers scale, are associated with higher levels of progress in vocabulary and early literacy skills.

Curriculum Related to Early Literacy and Language Development

Given the findings from Weikle and Hadadian (2004) in their review of literature regarding children with disabilities and early literacy and language development, we know that early experiences are crucial to literacy development for children with disabilities. They specifically noted that reading frequently to children, having books available to children, and modeling literacy activities may help children learn literacy skills. However, we again find in the current study that the hypothesis was not strongly supported, except with regards to Lowercase Alphabet Knowledge. The hope was that more frequent and higher quality experiences with literacy curriculum experiences would have a significant positive association with language and literacy development for children with disabilities. Results indicate that for the most part there is a positive relationship between experiences and progress, but this relationship is not statistically significant for most of the variables. Again we see a strong correlation between Lowercase Alphabet Knowledge and the variables of interest, in this case curriculum experiences, but the number of children evaluated in this area was quite small and the variability in both children's and teachers' scores on the measures was limited. This suggests that perhaps the findings noted were more of a function of the small sample size and our ability to draw meaningful conclusions regarding these variables is limited.

The three areas of children's language and literacy development that show promise for a positive relationship between curriculum experiences and child outcomes are Letter Sound Awareness, Beginning Sound Awareness and Print and Word Awareness. A possible explanation for positive relationships with these three areas of literacy and language development is that the ELLCO Literacy Activities Rating Scale measures the amount of book reading experiences a child has in the classroom. Hearing words and letters being read and seeing the print on the pages of books, may influence development for children with disabilities. The study by Justice et al. (2009) that focused on teachers' print referencing style during book reading, such as asking questions about the print the book, commenting on the print, and helping children to follow the text by pointing to words, found children whose teachers used these strategies made greater gains in print concept knowledge and alphabet knowledge than children whose teachers read books to them as they normally would. If teachers in the classrooms for the current study used similar print referencing styles, like those in Justice et al.'s study, children with disabilities might make more progress in early literacy and language development. These book reading experiences may be considered a proximal process by Bronfenbrenner because they are, hopefully, "enduring forms of interaction in the immediate environment" (1994, p. 38). Results like these and those from Neuman's Books Aloud study (1999) demonstrate the importance of reading to children, but reading alone may not be enough to produce significant gains for children with disabilities. Perhaps curriculum experiences that make use of more teacher modeling, like the study by Roskos et al. (2008) which used the Doors to Discovery curriculum, and an observation tool that

measures teacher modeling would contribute more to significant gains in language and literacy for children with disabilities.

Teacher Practices and Interactions Related to Early Literacy and Language Development

In preschool classrooms, teachers have many opportunities to make an impact on children's early literacy and language development. It is possible to see teachers as having influence over children's development when considering Bronfenbrenner's theory because they are responsible for creating the context, as well as modeling and fostering involvement in proximal processes such as book reading, writing activities, creating environmental print and vocabulary activities. When observing results for the first three research question correlations, we see that the question yielding the greatest number of significant results has to do with teacher practices and interactions with children with disabilities. Many of the significant results, however, have to be interpreted with caution.

Once again, we find that Lowercase Alphabet Knowledge and Letter Sound Awareness exhibited strong correlations with measures of teachers' practices but, due to the small number of participants, it is not possible to generalize these findings. However, we should not discount the correlations for Beginning Sound Awareness and Print and Word Awareness. Four of the teacher variables from the TBRS, Written Expression quality, Phonological Awareness quality and Oral Language Use with Students quantity and quality, were found to have significant positive associations with children's Beginning Sounds Awareness progress. These results indicate that higher quality modeling of writing, writing opportunities and centers, integration and provision of phonological awareness into activities and how teachers speak to and with children may

have an impact on early literacy and language development.

Gest et al. (2006) suggests that teachers should try to use all types of talk across all contexts in their classrooms to help children develop their early literacy and language skills. This suggestion was supported with a significant positive correlation between teachers' Oral Language Use and children's Beginning Sound Awareness. The results for teachers' Oral Language Use and children's Beginning Sound Awareness illustrate the importance of teachers engaging children in talk, not only during book reading activities but also while children are participating in other activities and centers in the classroom. If oral language use with children with disabilities during activities and centers in the classroom is associated with significant gains in literacy and language development, then it may also be important to incorporate quality language into normal classroom routine.

A final significant finding for teacher practices and interactions relating to early literacy and language development was the correlation between teachers' scores on TBRS Written Expression quality and children's scores on PALS Print and Word Awareness. A number of studies have found that the frequency with which literacy curriculum experiences are modeled for children and the curriculum used may also contribute to children's early literacy and language development (Clark & Kragler, 2005; Hamre et al., 2010; Roskos et al., 2008). For the current study, only the quality of teachers' written expression was correlated with children's print and word awareness skills. If teachers model letter shapes, correct spelling of words and proper grammar, then children with disabilities may be more likely to develop early literacy and language

skills. Although teacher practices and interactions did not produce significant results, when comparing these results with results from environment and curriculum measures we see that teachers may have the most influence on early literacy and language development for children with disabilities.

Overall, findings related to teacher practices and interactions are limited, but this may be due to the fact that many of the child participants were from significantly disadvantaged families and perhaps preschool is not a sufficiently intense enough intervention to expect greater gains.

Teachers' Education and Training Related to Early Literacy and Language Development

The hypotheses related to research questions related to teachers' level of education and professional development training expected to find that teachers with higher education and more training have children with disabilities make more progress on early literacy and language measures. However, results for the ANOVA which took into consideration teachers' level of education, and the correlation between number of hours of training and children's progress for the current study indicated that neither variable was associated with significant growth.

This is an interesting finding given that there were some significant results for teacher practices and interactions with children, which could be linked to education. But this should not come as too much of a surprise because of what we have learned from previous research. Recall the study by Justice et al. (2008) where they investigated the quality of literacy instruction through the implementation of a single curriculum across 135 preschool classrooms. They found that higher quality literacy instruction was

present when teachers had higher levels of self-efficacy, not when they had higher levels of education. Perhaps, then, teacher practices and interactions is the more important variable to consider when examining early literacy and language development.

In the current study, teachers' hours of professional development were not significantly related to children's early literacy and language development. Some areas of development, such as letter recognition, name writing, print and word awareness, and nursery rhyme awareness, were negatively related to teachers' hours of professional development; however, none of these relationships were significant. Perhaps looking at number of hours logged is not enough. What really may be important to consider when thinking about how professional development relates to early literacy and language development for children with disabilities is not how many hours do teachers have, but what type of professional development teachers are receiving and how training tools, such as specific curricula, are being used. We have learned from previous studies that the aid of a coach or mentor has been beneficial (Dickinson & Caswell, 2007; Podhajski & Nathan, 2005; Powell et al., 2010). It is probably never going to be enough to say the more hours of professional development the better, but teachers' retention, practice and implementation of information from trainings correctly will influence growth.

Implementation of IEP Related to Early Literacy and Language Development

Timing of children receiving special education services has long been a concern for teachers, especially those children who may need Individualized Education Plans (Peterson et al., 2004). Results from the t-test conducted to compare children who had an IEP in the fall and continuing in the spring with children whose IEP was completed in the

spring found that children were significantly different in one area, vocabulary; meaning that the gain in number of vocabulary words, as measured by the PPVT, was greater for children whose diagnosis of a disability was made earlier. Children whose IEP was completed by the spring made more gains than the other children on Uppercase Alphabet Knowledge, Name Writing, Print and Word Awareness and Nursery Rhyme Awareness, although none were significant. A possible reason for this could be that children who started to get services in the spring had scores lower than other children in the fall, but once they started to receive services, spring scores revealed that they were at the same level as children who had been receiving services in the fall, but had simply gained more on certain measures.

Limitations

There were a few important limitations in the current study to point out. First, with regards to the developing child, it is important to remember how simply getting older will affect early literacy and language development. It could be possible that children demonstrated growth because it is typical to add words to your vocabulary, learn and recognize letters, sounds, rhymes and how to write your name over time even without participating in classroom experiences that may facilitate that growth. While it is still important for a developing person to receive input from their surroundings and engage in learning activities, one should not discount the role that development may play in noted gains in children's language and literacy skills. One measure used in the study, the PPVT, is standardized and normed and, therefore, takes development into account when a child's standardized score is calculated. The other measures are not standardized or

normed. Future studies may want to include a control group as a way to take natural growth and development into account. Also important to consider when examining the developing child is the severity of his or her disability. The current study did not take into account the severity level of each child's disability, which has the potential to influence both natural growth and growth due to classroom factors.

The sample is also an aspect of limitation for the current study. Only 56 children were in the total sample, which was approximately cut in half to create a randomly selected sub-sample making it more difficult to find significant results. Once the random sub-sample was created, a t-test and Chi-square tests were conducted to compare children on demographic variables to make sure children selected were equivalent to those not selected. Results from these analyses indicated that children selected versus those not selected were not significantly different in age, gender or ethnicity. However, with such a small sample size, and in turn less power, non-significant results should be interpreted cautiously. We cannot rule out that the non-significant results for the correlational analyses that used the sub-sample when examining physical environment, curriculum and teacher practices and interactions might be significant with a larger *N* because then there would be more power. Very strong correlations were found for PALS Lowercase Alphabet Knowledge with ELLCO Literacy Activities Rating Scale and TBRS Centers, Print and Letter Knowledge, Written Expression, Phonological Awareness and Oral Language Use scales. These results presented perfect correlations, which are highly unusual and therefore somewhat suspect. Perhaps the strong correlations are a result of the small sample size and limited variation in scores on the measures rather than actual

associations between the variables. Another aspect of the sample that may be limiting is that the majority of the children come from low-income households and may not have the resources at home to reinforce language and literacy development.

A third limitation to be concerned about is how appropriate the use of the child outcome measures used when examining early literacy and language development. Recall from the description of measures that the Peabody Picture Vocabulary Test- Third Edition (PPVT-III) examines children's vocabulary by having children hear a word and identify the corresponding picture from a collection of pictures. It is possible that this measure may be tapping into children's visual or spatial development, and not truly getting at their language development. Perhaps having children look at the pictures and having to come up with a word that represents the picture would assess their vocabulary more accurately. It is possible that several of the PALS measures also rely heavily on a child's visual spatial skills, and test this construct rather than the actual construct of interest.

Along with looking at the appropriateness of measures, the gain scores resulting from children's scores on each measure may not be appropriate to use. Simply having a speech or language disability, which the majority of the children in the current study had, may have made it harder to determine progress or demonstrate less progress than typically developing children of this age based on the child measures used.

Another limitation to this study is that children with disabilities are only being assessed within the microsystem of classroom settings. It is possible that children who have disabilities are receiving extra help at home or through other agencies. The

measures used in this study do not take home environment, interactions with family and other care takers or access to resources into consideration. Within these other contexts, children may be working with adults who are not their teacher to re-enforce concepts and build on literacy and language skills. The setting could also be one on one, which may have a bigger impact than activities presented for an entire classroom of children. If a child only lived in his or her classroom, then we could say that there definitely is or is not a direct impact, but this is not the case in the current study.

A final limitation to contemplate would be how teachers' professional development was measured. The current study only took into consideration the number of hours, as reported by teachers, that they spent in professional development. What was not taken into account was the content of the professional development or if they were working with a mentor, coach or another teacher. If a teacher had professional development in something not related to teaching or children, then the content of the professional development may not be reflected in their teaching practices and interactions with children. Previous studies have found several variables to be important to professional development, including specific curricula training and implementation (Hamre et al., 2010; Justice et al., 2008) or collaborating and learning from someone who is an expert (Dickinson & Caswell, 2007; Podhajski & Nathan, 2005; Powell et al., 2010). Perhaps if this study would have examined only hours in professional development around curriculum or hours spend with a coach, results would have shown an association.

Conclusions

Although most hypotheses were not supported by the results, it is important to reflect on what was learned through the study. Taking into account the sample and limitations of the study, a few observations related to the current study can be made. One of the most vital aspects of the study is the children with disabilities. Really knowing and understanding how children with disabilities learn and develop is crucial to helping them progress in early literacy and language skills. Most teachers learn about typical development and use that to measure all children, but more and more we are seeing children that do not fit into that “typical” mold for one reason or another. Along with understanding how a child’s disability can influence literacy and language growth, knowing unique traits of each individual child may allow teachers to reach children in ways they never expected.

A second essential element to literacy and language improvement is teachers. Teachers are responsible for carrying out, and sometimes creating, activities that will engage children, build on previous knowledge and motivate them to learn more. Results reveal that certain teacher practices and language interactions with children do have a significant relationship with some components of literacy and language, which places an amount of responsibility on teachers. Adults with this great responsibility need to view it as such and do the best they can to provide positive learning experiences and model skills for children. Children with disabilities often require extra care and patience that teachers must be willing to give if children are to gain the fundamentals for future learning. Teachers may also need to realize the importance of working and learning from

colleagues and others who can offer insight into working with children with disabilities. Although not a major focus of this study, teachers can benefit from considering how parents, siblings, neighbors and friends that children look to as examples for learning can serve as resources for their work with children with disabilities.

A final observation to be made regarding early literacy and language development for children with disabilities points to the importance of timely receipt of services. Even though children's gain scores on the PPVT was the only variable to demonstrate a significant difference between children with IEPs completed in the spring versus children whose IEPs were completed at the beginning of the program year, vocabulary is a major component of literacy and language. Therefore this finding could be particularly important in the effort to improve language and literacy outcomes for children with disabilities. Too often children with disabilities are not identified early, and by the time someone notices that there is an issue, children can be significantly behind their peers. If teachers recognize any problems with learning or development early on, it is possible that children will begin to get the help they need to stay on positive learning trajectories. Regardless of when help for children is established, it is never too early or too late to help a child develop literacy and language skills that last a lifetime.

REFERENCES

- Boudreau, D. M. & Hedberg, N. L. (1999). A comparison of early literacy skills in children with specific language impairment and their typically developing peers. *American Journal of Speech-Language Pathology*, 8, 249-260. doi: 1058-0360/99/0803-0249
- Bronfenbrenner, U. (1994). Ecological models of human development. In T. Husen & T. N. Postlethwaite (Eds.), *International Encyclopedia of Education* (2nd Ed., Vol. 3, pp. 1643-1647). Oxford, England: Pergamon Press.
- Bronfenbrenner, U. & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner (Ed.), *Handbook of Child Psychology* (pp.793-828). New Jersey: John Wiley and Sons.
- Bryant, D. M., Burchinal, M., Lau, L. B., & Sparling, J. J. (1994). Family and classroom correlates of head start children's developmental outcomes. *Early Childhood Research Quarterly*, 9, 289-309. doi:10.1016/0885-2006(94)90011-6
- Catts, H. W. (1991). Early identification of reading disabilities. *Topics in Language Disorders*, 12, 1-16.
- Clark, P. & Kragler, S. (2005). The impact of including writing materials in early childhood classrooms on the early literacy development of children from low-income families. *Early Child Development and Care*, 175, 285-301. doi: 10.1080/0300443042000266295

- Clawson, C. & Luze, G. (2008). Individual experiences of children with and without disabilities in early childhood settings. *Topics in Early Childhood Special Education, 28*, 132-147. doi: 10.1177/0271121407311482
- Cunningham, A. E., Zibulsky, J., & Callahan, M. D. (2009). Starting small: Building preschool teacher knowledge that supports early literacy development. *Reading and Writing: An Interdisciplinary Journal, 22*, 487-510. doi: 10.1007/s11145-009-9164-z
- Dickinson, D. K. & Caswell, L. (2007). Building support for language and early literacy in preschool classrooms through in-service professional development: Effects of the Literacy Environment Enrichment Program (LEEP). *Early Childhood Research Quarterly, 22*, 243-260. doi: 10.1016/j.ecresq.2007.03.001
- Dickinson, D. K., McCabe, A., Anastasopoulos, L., Peisner-Feinberg, E. S., & Poe, M. D. (2003). The comprehensive language approach to early literacy: The interrelationships among vocabulary, phonological sensitivity, and print knowledge among preschool-aged children. *Journal of Educational Psychology, 95*, 465-481. doi: 10.1037/0022-0663.95.3.465
- Dickinson, D. K. & McCabe, A. (2001). Bringing it all together: The multiple origins, skills, and environmental supports of early literacy. *Learning Disabilities Research & Practice, 16*, 186-202. doi:10.1111/0938-8982.00019
- Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., ... Zill, N. (2007). Teachers' education, classroom quality, and young children's

academic skills: Results from seven studies of preschool programs. *Child Development, 78*, 558-580. doi: 10.1111/j.1467-8624.2007.01014.x

Gest, S. D., Holland-Coliello, R., Welsh, J. A., Eicher-Catt, D. L., & Gill, S. (2006).

Language development subcontexts in head start classrooms: Distinctive patterns of teacher talk during free play, mealtime, and book reading. *Early Education and Development, 17*, 293-315. doi:10.1207/s15566935eed1702_5

Hamre, B. K., Justice, L. M., Pianta, R. C., Kilday, C., Sweeney, B., Downer, J. T., &

Leach, A. (2010). Implementation fidelity of MyTeachingPartner literacy and language activities: Association with preschoolers' language and literacy growth. *Early Childhood Research Quarterly, 25*, 329-347. doi:

10.1016/j.ecresq.2009.07.002

Justice, L. M., Invernizzi, M. A. & Meier, J. D. (2002). Designing and implementing an

early literacy screening protocol: Suggestions for the speech-language pathologist. *Language, Speech, and Hearing Services in Schools, 33*, 84-101.

doi:10.1044/0161-1461(2002/007)

Justice, L. M., Kaderavek, J. N., Fan, X., Sofka, A., & Hunt, A. (2009). Accelerating

preschoolers' early literacy development through classroom-based teacher-child storybook reading and explicit print referencing. *Language, Speech, and Hearing Services in Schools, 40*, 67-85. doi:10.1044/0161-1461(2008/07-0098)

Justice, L. M., Mashburn, J. A., Hamre, B. K., & Pianta, R. C. (2008). Quality of

language and literacy instruction in preschool classrooms serving at-risk pupils.

Early Childhood Research Quarterly, 23, 51-68. doi:

10.1016/j.ecresq.2007.09.004

Kelley, P. & Camilli, G. (2007). *The impact of teacher education on outcomes in center-based early childhood education programs: A meta-analysis*. Working paper,

NIEER. Retrieved from <http://nieer.org/resources/research/TeacherEd.pdf>

Kliewer, C., Fitzgerald, L. M., Meyer-Mork, J., Hartman, P., English-Sand, P., &

Raschke, D. (2004). Citizenship for all in the literate community: An ethnography

of young children with significant disabilities in inclusive early childhood

settings. *Harvard Educational Review*, 74, 373-403. Retrieved from

<http://qseweb.harvard.edu/%7Ehepq/wi04.htm>

Koppenhaver, D. A., Coleman, P. P., Kalman, S. L. & Yoder, D. E. (1991). The

implications of emergent literacy research for children with developmental

disabilities. *American Journal of Speech-Language Pathology*, 1, 38-44.

Retrieved from <http://ajslp.asha.org/cgi/content/abstract/1/1/38>

Malone, D. M, McKinsey, P. D., Thyer, B. A., & Straka, E. (2000). Social work early

intervention for young children with developmental disabilities. *Health and Social*

Work, 25, 169-180. Retrieved from

<http://www.ncbi.nlm.nih.gov/pubmed/10948456>

Missall, K. N, McConnell, S. R., & Cadigan, K. (2006). Early literacy development: Skill

growth and relations between classroom variables for preschool children. *Journal*

of Early Intervention, 29, 1-21. doi:10.1177/10538151060290010

- Neuman, S. B. (1999). Books make a difference: A study of access to literacy. *Reading Research Quarterly, 34*, 286-311. Retrieved from <http://www-personal.umich.edu/~sbneuman/pdf/BooksMakeADifference.pdf>
- National Child Care Information and Technical Assistance Center. (2010). *United states child care statistics*. Retrieved from <http://nccic.acf.hhs.gov>
- National Institute for Early Education Research (NIEER). (2010). *State preschool yearbook*. Retrieved from <http://nieer.org/yearbook/>
- Peterson, C. A., Wall, S., Raikes, H. A., Kisker, E. E., Swanson, M. E., Jerald, J., Atwater, J. B., & Qiao, W. (2004). Early head start: Identifying and serving children with disabilities. *Topics in Early Childhood Special Education, 24*, 76-88. Retrieved from <http://digitalcommons.unl.edu/famconfacpub/42>
- Podhajski, B. & Nathan, J. (2005). Promoting early literacy through professional developmental for childcare providers. *Early Education & Development, 16*, 23-42. doi: 10.1207/s15566935eed1601_2
- Powell, D. R., Diamond, K. E., Burchinal, M. R., & Koehler, M. J. (2010). Effects of an early literacy professional development intervention on head start teachers and children. *Journal of Educational Psychology, 102*, 299-312. doi: 10.1037/a0017763
- Roskos, K., Ergul, C., Bryan, T., Burstein, K., Christie, J., & Han, M. (2008). Who's learning what words and how fast? Preschoolers' vocabulary growth in an early literacy program. *Journal of Research in Childhood Education, 22*, 275-290. Retrieved from <http://www.acei.org>

- Saracho, O. N. & Spodek, B. (2007). Early childhood teachers' preparation and the quality of program outcomes. *Early Child Development and Care, 177*, 71-91. doi: 10.1080/03004430500317366
- Schuele, C. M. (2004). The impact of developmental speech and language impairments on the acquisition of literacy skills. *Mental Retardation and Developmental Disabilities Research Reviews, 10*, 176-183. doi: 10.1002/mrdd.20014
- Sontag, J. (1996). Toward a comprehensive theoretical framework for disability research: Bronfenbrenner revisited. *The Journal of Special Education, 30*, 319-344. doi:10.1177/002246699603000306
- Steele, M. M. (2004). Making the case for early identification and intervention for young children at risk for learning disabilities. *Early Childhood Education, 32*, 75-79. doi: 10.1007/s10643-004-1072-x
- Tudge, J. R. H., Otero, D. A., Hogan, D. M., & Etz, K. E. (2003). Relations between the everyday activities of preschoolers and their teachers' perceptions of their competence in the first years of school. *Early Childhood Research Quarterly, 18*, 42-64. doi:10.1016/S0885-2006(03)00005-X
- Tudge, J. R. H., Mokrova, I., Hatfield, B. E., & Karnik, R. E. (2009). Uses and misuses of Bronfenbrenner's bioecological theory of human development. *Journal of Family Theory & Review, 198-210*. doi: 10.1111/j.1756-2589.2009.00026.x
- U.S. Department of Education. (2007). *IDEA Child count data tables*. Retrieved from <https://www.ideadata.org/default.asp>

- Vandell, D. L., & Wolfe, B. (2000). Child care quality: Does it matter and does it need to be improved? Retrieved October 22, 2010, from www.aspe.hhs.gov/hsp/ccquality00/
- VanDerHeyden, A. M. & Snyder, P. (2006). Integrating frameworks from early childhood intervention and school psychology to accelerate growth for all young children. *School Psychology Review*, 35, 519-534. Retrieved from <http://nasponline.org/publications/spr/index.aspx?vol=35&issue=4>
- Weikle, B. & Hadadian, A. (2004). Literacy, development and disabilities: Are we moving in the right direction? *Early Child Development and Care*, 174, 651-666. doi: 10.1080/0300443042000187149
- Whitehurst, G. J. & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, 69, 848-872. Retrieved from <http://www.jstor.org/stable/1132208>
- Whitmore, K. F., Martens, P., Goodman, Y. M., & Owocki, G. (2004). Critical lessons from the transactional perspective on early literacy research. *Journal of Early Childhood Literacy*, 4, 291-325. doi: 10.1177/1468798404047291