

CONTRIBUTION OF THE HOME ENVIRONMENT TO PRESCHOOL

CHILDREN'S EMERGENT LITERACY SKILLS

A Dissertation

by

REBEKAH MINA HAYNES

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2010

Major Subject: School Psychology

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Approved by:

Chair of Committee, Committee Members,	Jorge E. Gonzalez Constance Fournier Ernest Goetz R. M. Joshi
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## ABSTRACT

Contribution of the Home Environment to Preschool Children's Emergent Literacy

Skills. (August 2010)

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Chair of Advisory Committee: Dr. Jorge E. Gonzalez

Recent and ongoing research has demonstrated the alarming likelihood of children from low-income homes and from ethnic minorities to read at much lower reading levels than their peers. Additionally, reading ability is related to the earliest of emergent literacy skills, which can be measured in young children before they enter formal schooling. The home environment, including the available resources, support for literacy and school, and the parent-child relationship, plays an important role in promoting the development of emergent literacy skills. More research is needed, however, to inform programs and researchers about the specific relationship between the home environment and emergent literacy development.

The current study was conducted using a sample of 122 preschool children enrolled in ERF enriched preschool classrooms in one school located in a Southwestern state. The study investigated the power of three variables of the home literacy environment (HLE) (i.e., *Family Reading and Writing*, *External Resources*, and *Daily Activities*) to predict three emergent literacy outcomes (i.e., receptive oral language, alphabet knowledge, and name writing) using canonical correlation analysis (CCA). The

study also used commonality regression analysis to examine the shared and unique variance in these emergent literacy outcomes accounted for by the variables of the HLE and the parent-child relationship. The results of the CCA did not find the variables of the HLE to have a statistically significant relationship with the emergent literacy outcomes. Missing data techniques were used to account for incomplete data, and the results were closer to obtaining statistical significance when the more advanced method of multiple imputation was used to account for missing data, with the *p*-value decreasing from .751 with listwise deletion to between .094 and .504 with multiple imputation. The second analysis of the study, the commonality regression analysis, did find home variables to account for unique and shared variance in the emergent literacy outcomes, particularly in preschool name writing. Specifically, the *External Resources* scale of the *Familia Inventory* (Taylor, 2000) uniquely accounted for the smallest amount of variance (i.e., .1%) in name writing, while the scores of the PCRI uniquely accounted for the largest amount of variance (i.e., 3.4%). When combined together, however, the predictor variables accounted for larger amounts of variance in name writing ability. The *Familia Inventory* scale of *External Resources* accounted for the smallest amount of variance when combined with the other predictor variables (i.e., 21.5%) while the scores on the *PCRI* accounted for the largest combined amount of variance, accounting for 31.4% of the variance in name writing ability. These results complement and extend on existing research. The findings, limitations, and implications of the results of this study are discussed.

## DEDICATION

This work is dedicated to the best professor of child development I have ever had: my son, Abram. He has made the practice of school psychology real to me and has taught me more about parents, children, and family than any other experience in my life.

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Finally, I extend deep gratitude to my family. My parents have taught me hard work and, most importantly, compassion, and have supported and encouraged me at every life turn. My brother and sister are my best friends and strongest confidants. My husband, Ben, has given me confidence, support, and humor through graduate school and through this research project, and has provided me with an amazing extended family and, of course, with the love of our life, Abram.

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## CHAPTER I

### INTRODUCTION: EMERGENT LITERACY AND THE HOME ENVIRONMENT

Over the last decade, federal and state programs designed to address the early childhood educational needs of minority and low-income children have been the subject of much research (United States Department of Education, 2007a). This attention is due largely to alarming findings demonstrating that young children from these populations are nearly twice as likely to perform at or below basic reading levels compared to their White or economically advantaged peers (National Center for Educational Statistics, 2007; National Research Council, 1998). Because early literacy skills are linked to later reading success (e.g., Scarborough, 2001), the role preschool programs can play in improving emergent literacy skills and later reading outcomes has been well-researched (e.g., Barnett, 2001). As we begin to understand and acknowledge the early roots of literacy and the impact these roots have on later reading success, it is more apparent that the years before formal schooling are crucial to children's short and long-term literacy success (Whitehurst & Lonigan, 1998, 2001). Research has clearly demonstrated that high-quality early childhood intervention programs can overcome early deficits and may have benefits that extend beyond childhood (Dickinson & Sprague, 2001; Neuman, 2006; NICHD Early Childhood Care Research Network, 2005). These lines of research formed the basis for federal initiatives targeting preschool such as the *No Child Left Behind's (NCBL)*, *Good Start, Grow Smart* (U.S. Department of Education, 2001b)

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This dissertation follows the style of *Journal of Early Intervention*.

and its flagship program *Early Reading First* (ERF) (U.S. Department of Education, 2007b). Access to vital early childhood education has improved for many low-income children as a result of such federal programming (Christie, Enz, & Vukelich, 2002; U.S. Department of Education, 2007a).

Although early childhood education has recently been at the forefront of federal and state efforts, preschool programs have been part of public policy on education for several decades. Since the 1960s, preschool programs were developed to overcome the environmental and experiential deficits experienced by many young children growing up in poverty. Researchers quickly recognized, however, that early literacy development did not occur solely in a classroom vacuum and that other factors surrounding young children must also be researched. For example, the lack of familiarity with schooling was a brick wall for many children as they transitioned from impoverished home environments to school settings. The demands of formal schooling were vastly different than home experiences, especially for the economically disadvantaged and minority children. It was often difficult or impossible for these children to adjust with efficiency and prosper in the educational environment (Bowman, Donovan & Burns, 2001). Armed with such findings, researchers began to investigate the impact the home environment had on early literacy and language development. A closer look at the home environment revealed stark disparities in parent-child language use, literacy supports and relational aspects between low and higher-income families (e.g., Bowman, et al.; Britto & Brooks-Gunn, 2001; Hart & Risley, 1995). In fact, some research has shown that low-income generated stressors have their effect via low levels of parental involvement and

responsiveness, inattention to children's educational endeavors, and impaired relationships, all which contributed negatively to a child's language development (Neuman, 2006).

Research into the support for literacy provided by the home environment, termed the home literacy environment (HLE), and its relationship to emergent literacy, has been accumulating for more than two decades. Although previous research is informing, more research is needed to determine the unique and overlapping importance of various dimensions of the HLE to literacy outcomes in young children, especially those from low-income and minority backgrounds. Additionally, the parent-child relationship, a centrally important component of the home environment (Pianta, 2004), has been shown to be potentially more important than other parts of the home environment, including the HLE, in promoting reading-related outcomes (Dodici, Draper, & Peterson, 2003). Much more research is needed to examine the connections between the parent-child relationship and emergent literacy development. Because both the HLE and the parent-child relationship can have tremendous influence on a child's emergent literacy development, there is ample justification for considering these as important areas of research and thereby intervention.

Because literacy skills have been shown to be inextricably linked to the home environment (Vernon-Feagans, Hammer, Miccio & Manlove, 2001), the present study investigated early literacy skills as related to the HLE and parent-child relationship in the context of performance of preschoolers enrolled in an Early Reading First (ERF) funded preschool. As mentioned, quality preschool programming is a major area of intervention

that has been shown to improve reading-related outcomes (Barnett, 2001). Preschool programs initially targeted mainly social-emotional skills, but more recent programs have focused on improving early reading skills (Mashburn, 2008). These early reading skills, often referred to as emergent literacy, are remarkably stable, and foreshadow later reading abilities (Whitehurst & Lonigan, 1998).

### *Emergent Literacy*

Emergent literacy has been defined as the skills, knowledge, and attitudes that are the precursors to conventional reading and writing (Whitehurst & Lonigan, 1998). The concept of emergent literacy departs from earlier theories of early reading skills in that it proposes that reading is influenced by the earliest of influences, beginning from a child's infancy (Lonigan, 2004). Early differences in these skills among school children show remarkable stability over time and can be predictive of widening literacy gaps to come especially for children from different economic, racial and linguistic backgrounds (Dickinson & Sprague, 2001).

Many, though not all, researchers follow an emergent literacy model proposed by Whitehurst and Lonigan (1998) and then updated by Storch and Whitehurst (2002). This model divides the skills that comprise emergent literacy into two divisions: oral language skills and code-related skills. The division of the skills highlights research findings indicating that oral language skills have more of an influence on later reading while code-related skills, such as phonological awareness, alphabet knowledge, and print concepts, have a more direct influence on early reading (Storch & Whitehurst). This study investigated one area of oral language, receptive vocabulary, and two code-related

skills, namely, alphabet knowledge and print concepts. Phonological awareness, while an important emergent literacy skills, was not measured by the project school participating in the current study. The three measured emergent literacy skills are among the skills emphasized by the ERF enriched preschool program. These three skills have been shown through research to be important precursors to reading success (e.g., Adams, 1990; Lonigan, Burgess & Anthony, 2000; National Institute for Literacy, 2007; Scarborough, 2001). Additionally, much research has shown that dimensions of both the HLE and parent-child relationship interact to determine short and long-term ability on these emergent literacy skills.

### *The Home Literacy Environment*

The HLE has been the subject of research during the last several decades (see Anderson and Stokes, 1984; Wasik, 2004) and has been conceptualized in various ways. Early conceptualizations exclusively included reading-related family behaviors while more recent conceptualizations include measures of verbal interactions and social-emotional quality (e.g., Britto & Brooks-Gunn, 2001; Edwards, 2007; Hart & Risley, 1995). Much research has accumulated demonstrating various domains of the HLE are related to emergent literacy outcomes. The current study investigated three domains of the HLE as assessed by the *Familia Inventory* (Taylor, 2000): *Family Reading and Writing* (e.g., shared book reading, parental modeling), *External Resources* (e.g., library use, extended family), and *Daily Activities* (e.g., television use, verbal interactions). All three domains have research demonstrating their support of the HLE and to emergent literacy outcomes (e.g., Beals, 2001; Gonzalez & Uhing, 2008; Sénéchal, 2006a).

### *The Parent-Child Relationship*

While the HLE is an important area of research, it is impossible to investigate the role a child's environment plays in literacy-related outcomes without considering the influence of relationships in the home. The milestones and achievements of young children, including those related to language and reading, each take place in the context of the relationship with the adult in a care giving role (Shonkoff & Phillips, 2000). Early relationships between parents and children most likely influence the way in which a child learns to interact socially, thus preparing them for their first schooling experiences (Pianta, 1997; 2004). Looking specifically at academic and reading outcomes, the quality of the parent-child relationship has been shown to be related to positive early academic success (e.g., Pianta, Nimetz, & Bennett, 1997), and in at least one study, was a stronger predictor of emergent reading outcomes than the HLE (Dodici, et al., 2003). Specifically, high quality attachment, interactions, and responsiveness between parent and child are related to positive emergent literacy outcomes (e.g., Bus & van IJzendoorn, 1997; Dodici, et al.; Morrison, Rimm-Kauffman, & Pianta, 2003). Other parent-child factors, including limit setting and the overall warmth of the relationship also are linked to early academic success (e.g., Conner, 2000; Merlo, Bowman, & Barnett, 2007). Although some research has investigated the parent-child relationship and emergent literacy, this important factor associated with the home environment has generally been understudied in research regarding early literacy development (Pianta, 2004). Research should further examine the extent to which high quality parent-child relationships are related to emergent literacy outcomes. The current study used the *Parent-Child*

*Relationship Inventory (PCRI)* (Gerard, 1994) as a single measure of this relationship.

Clearly, a better understanding of the home environment as a whole, including the HLE and the parent-child relationship, can assist in a greater understanding of proximal influences on early literacy development.

Given the need for additional and more detailed research on both the HLE and the parent-child relationship as they relate to emergent literacy, the current study aimed to extend on previous work by investigating the interrelationship between the HLE and emergent literacy outcomes by using canonical commonality analysis (CCA) which enables researchers to investigate interrelationships when multiple dependent variables (i.e., emergent literacy outcomes) are present. Additionally, the current study used commonality analysis to determine which domains or combination of domains of the HLE and the parent-child relationship account for unique and overlapping variance in emergent literacy skills. This statistical approach has the unique benefit of partitioning the variance in emergent literacy outcomes in order to determine the single and combined variables which account for the most variance. The goal of this statistical approach was to provide information about the amount of variance accounted for by the HLE domains and the parent-child relationship and by any of the combination of these dimensions.

#### *Purpose of the Study*

The purpose of the study was to first investigate the interrelationship between two separate sets of variables: the domains of the HLE and emergent literacy outcomes. A goal of this investigation was to provide valuable information about the magnitude

and strength of the relationship between multiple dependent variables. Previous research has demonstrated an association between the home environment, including the parent-child relationship, and emergent literacy (e.g., Beals, 2001; Dodici, et al., 2003; Gonzalez & Uhing, 2008; Sénéchal, 2006a). This study attempted to add to the research about the strength between these two sets of variables. Next, both the *Familia Inventory* (Taylor, 2000) and the *PCRI* (Gerard, 1994) were used to examined which areas of the home environment, including domains of the HLE and the parent-child relationship and all combinations of these areas, account for unique and overlapping variance in three emergent literacy skills (i.e., receptive oral language, alphabet knowledge, and print concepts). This area has received some research attention (e.g., Gonzalez & Uhing); yet, more research is clearly needed given the importance of emergent literacy to later academic success, specifically in reading (Dickinson & Sprague, 2001). This line of research has important policy and intervention implications given the current focus on education and specifically on the influence of high-quality early childhood education. Research clearly demonstrates that while preschool programming can improve the reading-related outcomes of low-income children, the home environment may have even more influence on success in reading.

### *Research Questions*

The following questions were addressed in the current study:

1. To what extent can emergent literacy outcomes (receptive vocabulary, print concepts, and alphabet knowledge) be predicted by dimensions of the HLE (*Daily Activities, External Resources, Family Reading and Writing*)?

2. What is the shared and unique variance in English oral language outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?
3. What is the shared and unique variance in print concept outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?
4. What is the shared and unique variance in alphabet knowledge outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?

## CHAPTER II

### REVIEW OF LITERATURE

The purpose of this study was to explore the relationship and relative importance of the home literacy environment (HLE) and parent-child relationship on young children's emergent literacy skills (i.e., oral language, print awareness, and alphabet knowledge). The study took place in the context of an ERF federal grant providing enriched, full-day, quality preschool for low-income and English language learner (ELL) children. This review aims to survey the literature on connections between young children's home environments and how these environments relate to emergent literacy. The review will focus on the following content areas: (1) federal policy and preschool, (2) the prevalence of reading problems and related risk factors, (3) emergent literacy and emergent literacy skills emphasized by ERF, (4) the HLE (5) the parent-child relationship and (6) the interrelationships among these variables.

#### *Federal Policy and Preschool*

The number of children attending preschool in the United States is increasing, with 67% of 4-year-olds enrolled in preschool programs in 2002 compared to only 16% of the 4-year olds enrolled in 1965 (Barnett & Yarosz, 2004). Although preschool enrollment is on the rise, preschool is not a new educational development. Preschool programs in the United States began as early as the mid-19<sup>th</sup> century when public preschools were established to improve the education and well-being of children living in urban poverty (Mashburn, 2008). Preschool programs existed on a small scale until the 1960s when the intellectual, political, and social climate of the time led to greater

interest in early intervention programs for at-risk children (Condry, 1983). During the 1950s and 1960s, the fields of psychology and sociology were providing strong research evidence of the powerful influence of children's environments on cognitive development, particularly during early childhood. Additionally, social class research began demonstrating academic and cognitive disadvantages experienced by children growing up in low-income backgrounds. These research areas converged with sociopolitical movements (e.g., Civil Rights Movement) resulting in heightened emphasis on fighting poverty and federal focus on early prevention efforts (Condry, 1983). In this sociopolitical climate, preschool education became more common and readily accessible to children of low-income families.

In the last decade, federal and state policy focused more explicitly on providing funds and demanding quality standards for preschool education (Roskos, 2007). Laws and programs (e.g., No Child Left Behind (NCLB), Good Start/Grow Smart (U.S. Department of Education, 2001b) were initiated to address the quality of early experiences for children that promote optimal school outcomes. Roskos (2007) described the publication of several statements and bodies of research as a critical juncture in addressing the need for quality early literacy experiences. Moreover, a joint position statement by the International Reading Association (IRA) and the National Association for the Education of Young Children (NAEYC) outlined a set of crucial early literacy learning experiences. In addition, the National Research Council (NRC) published three works (i.e., *Preventing Reading Difficulties in Young Children* (Snow, Burns, & Griffin, 1998); *From Neurons to Neighborhoods* (Shonkoff & Phillips, 2000); *Eager to Learn*

(Bowman, et al., 2001) which synthesized research on early literacy and defined the scope and sequence of early literacy experiences and described the appropriate educational foundation for curriculum development.

During the same period as research emphasized quality preschool education, K-12 education was experiencing the “standards movement” (Roskos, 2007). The standards movement outlined what children should know, assessment procedures to assess what they know, appropriate curricula, and professional development requirements for educating children and youth. Early childhood education began endorsing the standards movement as well, with researchers and practitioners in early childhood attempting to embrace guidelines while also maintaining developmentally appropriate practices for young children. In fact, by 2005, 43 states had early childhood guidelines, and the remaining seven states were in the process of developing guidelines (Neuman & Roskos, 2005). The federal government also started providing support to early childhood through federal programs.

#### *Early Reading First (ERF)*

A crucial moment that impacted early childhood education occurred when the Bush administration announced the creation of the No Child Left Behind (NCLB) Act, a reauthorization of the Elementary and Secondary Education Act of 1965 (ESEA). The act passed in January 2002, with President Bush calling for accountability, flexibility, and choice in federally funded education programs (U.S. Department of Education, 2007a). The act included the *Good Start, Grow Smart* initiative which focused on three goals: strengthening the Head Start program, partnering with states to improve early

childhood education, and providing information to caregivers, teachers, and parents to enrich the education of young children (The White House, 2007). *Good Start, Grow Smart* was supported by research that underscored the positive effects early childhood education had on later academic achievement (Christie, et al., 2002) and included the development of Early Reading First (ERF), a program designed to facilitate high quality education for young children. Early Reading First was included because of concern that preschool children, particularly those from low-income backgrounds, were entering formal schooling without the academic and social readiness skills necessary to succeed in school. Early Reading First aimed to improve the opportunities for young children, particularly those from disadvantaged backgrounds, to acquire and develop key precursors to develop successful later reading.

In May of 2007, the results of the first national evaluation of ERF were published (U.S. Department of Education, 2007b). This national evaluation examined the results of the programs comprising the second round of ERF funded projects, beginning in 2003, and running for three years. The academic outcomes of the children indicated that ERF had a positive impact on alphabet knowledge and print knowledge, but unfortunately did not have a statistically significant positive effect on oral language or phonological awareness. In addition to the national evaluation, there has been one published report on the results of an individual ERF program (Martin, Emfinger, Snyder, O’Neal, 2007). The program included a comparison and a treatment group; however, the comparison group consisted of church-based preschool classrooms in which the children were of families of higher incomes and performed better on emergent literacy tasks at baseline. While

there were generally no significant differences between the groups on post-test results, children in the treatment group exceeded ERF expectations for letter naming at post-test, which the comparison group already met at pre-test. Additionally, longitudinal results indicated that children in the treatment group performed better than the comparison group on letter name fluency and nonsense word fluency in kindergarten and experienced less regression during the summer between kindergarten and first grade. Some of these results echo the national evaluation's results; however, the impact on summer regression is a notable and important finding. Future studies of ERF will hopefully help shed light on the impact the program has on developing the reading and academic readiness skills of children as they enter the later grades.

With preschool attendance and program support on the rise, research has focused specifically at the reading-related outcomes promoted by preschool. This trend is the result of the alarming rates of reading problems experienced by children in elementary grades and beyond (National Center for Educational Statistics, 2007). Specifically, the National Assessment of Educational Progress (NAEP) reported on the reading proficiencies of a nationally representative sample of 191,000 fourth graders and 160,700 eighth graders in the Nation's Report Card in 2007. The report indicated that the percentage of fourth grade students reading at or above a basic level was 67% while the percentage of eighth grade students reading at the basic level was 74% as measured by a national, standardized reading assessment (National Center for Educational Statistics). These numbers indicate that 33% and 26% of fourth and eighth grade students, respectively, did not meet the basic reading level on the assessment. The results for

minorities, specifically for African American and Hispanics, are even more sobering. Results show that approximately 46% of African American fourth graders and 50% of Hispanic fourth graders are reading at the basic level, compared to 78% of White fourth graders (National Center for Educational Statistics).

Because of the links between early and later reading problems (e.g., Juel, 1988; Scarborough, 2001), research has focused on examining the risk factors associated with the development of reading problems as well as the effectiveness of preschool programs in preventing later reading problems. Additionally, researchers have been investigating how to narrow the documented achievement gap between children from poverty and their more affluent peers.

#### *Prevalence of Reading Problems: Risk Factors*

In order to identify the risk factors for developing reading problems, it is helpful to first examine the prevalence rates in young children. The prevalence rates help to understand the magnitude of the risk. The prevalence of reading-related problems is frequently reported for children in upper elementary grades; yet, because of methodological issues, accurate prevalence rates for young children are uncertain (National Research Council, 1998). First, children are generally identified as having reading problems, such as a reading disability, throughout the early elementary years before fourth grade, but not in a specific grade level. In other words, identification of children with reading difficulties does not occur uniquely in one grade; rather identification spans across upper grades when reading difficulties become more apparent. Therefore, prevalence rates of reading difficulties in the youngest of students

in specific grade levels are most likely underestimates (National Research Council). Second, the assessment of reading skills in young children, particularly those in preschool and kindergarten, can be problematic because they are most likely not developmentally ready for conventional reading batteries. Young children are in the process of developing a set of skills and strategies that are the precursors to conventional reading (Salinger, 2001) and broad reading assessments that cluster skills rather than assess discrete skills may not be developmentally appropriate for young children.

Given these caveats, the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K), launched by the U.S. Department of Education in 1998, provides the best estimate of reading problems in young children. This study includes a nationally representative sample of 19,000 children who were assessed on academic and social measures from kindergarten through fifth grade. Results indicated that 18% of kindergarteners did not know conventions of print (read from left to right, etc.) and 34% could not identify letters by name (U.S. Department of Education, 2001a). The statistics are particularly alarming given research supporting a strong and persistent link between early reading deficiencies and later reading problems. It has been estimated that 65 to 75% of children identified as reading disabled at a young age continue to be poor readers through school (Juel, 1988; Scarborough, 2001).

Given the number of children exhibiting difficulties with early reading skills, it is also important to note that the gap in literacy skills between poor readers and average and good readers becomes larger as children progress through grades. A term often used in the literature to describe this phenomenon is the “*Matthew effect*.” This Biblical

reference, referring to a passage in the gospel of Matthew (25:29), was first used to describe reading-related deficits by Stanovich (1986). The use of this reference refers to the “rich-get-richer” trend that occurs in reading. Early success in language and literacy is correlated with later reading success. For example, Juel (1988) found that the probability that a child would be a poor reader at the end of fourth grade if he was a poor reader at the end of first grade was  $r = .88$ . Scarborough (2001) found in a meta-analysis of studies predicting later reading achievement from kindergarten and first grade reading skills that reading in kindergarten was as strong a predictor of reading achievement one to four years later as reading scores from one year predicted the next year’s reading. For example, kindergarten reading skills predicted later reading, such as in second or third grade, as well or better than first grade reading predicted second grade reading. This line of research demonstrates that early reading difficulties are clearly not easily overcome and persist.

Reading problems do not develop in isolation; rather, they are generally related to numerous risks. The prevalence rates indicate that many children in the United States are struggling to acquire reading skills necessary to escape developing later reading problems. The ECLS-K study provides insight into the risk factors experienced by children who are most likely to experience reading difficulties. Forty-six percent of kindergarten children in the sample have one of the following risks: a mother with less than high school education, a family on welfare or food stamps, a single parent household, or parents whose primary language is other than English (U.S. Department of Education, 2001a). Children with one risk factor are twice as likely as those with no risk

factors to be in the bottom quartile of reading scores, and children with two or more risk factors are three times as likely to be in the bottom quartile. These risk factors support findings from the National Research Council's (1998) report, *Preventing Reading Difficulties in Young Children*, concerning factors that predict reading problems. The council divided the factors into group and individual risk factors.

Group factors refer to factors that may be related to an identified group of children developing reading problems. Group factors include attending chronically low achieving schools, residing in low-income families and communities, and speaking English as a second language or a dialect of English that is substantially different than the English spoken in school (National Research Council, 1998). It is, however, important to note when considering group risk factors that the poverty rate is often higher in minority populations (Morrison, McDonald Connor, & Bachman, 2006); thus, risk factors for reading problems may co-occur.

Individual risk factors, which refer to factors that may predict reading problems even if a child is not exposed to group risk factors, include a parental history of reading problems, a lack of adequate literacy skills possibly because of a cognitive deficit, and an early language, hearing, or medical impairment or condition. The National Research Council (1998) identifies a history of family reading disabilities as a significant risk factor for children. This finding is supported by Scarborough's (1998) research, which found reading disabilities occur in 25% and 60% of families with a history of reading difficulties. This is much higher than the population rate of between 5 % and 10 % of people who are identified with a reading disability. Clearly, parental reading disabilities

are another important risk factor to consider. Taken together, these risk factors suggest children from disadvantaged homes and communities and those who are English language learners (ELL) as well as though who have a family history of reading disabilities are at a heightened risk for developing reading problems. Given the heightened risk for reading difficulties in certain groups, a focus on prevention during windows of optimal sensitivity is crucial. One such window occurs during the preschool period. Research has focused on preschool and the ability of preschool to mitigate the risk of reading difficulties for at-risk children.

#### *Preschool and the Prevention of Reading Difficulties*

When examining the effects of preschool on at-risk children's reading, most research has examined broad outcomes, such as cognitive ability and social-emotional development. Given that these domains support reading abilities (Barnett, 2001), it is important to note short- and long-term preschool effects in these areas. In a critical early review, the Consortium for Longitudinal Studies (Condry, 1983) analyzed the results of 11 different early intervention programs. The findings pointed to significant long-term effects on several outcomes including developed abilities (e.g., IQ, achievement scores) in early to middle childhood, school competence (i.e., special education placement, retention rates) in middle school and adolescence, attitudes toward achievement in adolescence, and educational attainment (e.g., high school degree) in early adulthood. This review was one of the first to investigate the impact of preschool on low-income children, and revealed that preschool programs can have an important early effect on

cognitive development and academic achievement in the short-term, which in turn may contribute long-term benefits in other areas like educational attainment.

In a recent review of 37 studies of preschool programs for disadvantaged children, Barnett (2001) evaluated the research on short- and long-term effects of “high” quality preschool programming on child outcomes related to intelligence, achievement, and school success (e.g., grade retention, special education placement), and looked specifically at reading outcomes. Short-term effects were found in general cognitive development and in academic and reading achievement. These effects were largest for children from low-income families.

The review by Barnett (2001) provided substantial support for the effectiveness of high quality preschool on reading achievement through the review of long-term effects. Most preschool programs showed initial gains in reading achievement congruent with the observed gains in cognitive abilities, but effects tended to fade through the early elementary grades. This trend should be interpreted with caution, however, as Barnett points out that the fading effect can likely be attributed to methodological issues commonly found in these studies. Not surprisingly, Barnett reported the strongest effects for studies that contained random assignment, such as the Abecedarian and the Perry Preschool studies. In contrast, only one of the quasi-experimental studies found consistent, lasting effects on reading. The High/Scope Perry Preschool and the Abecedarian studies are well-known studies of comprehensive preschool programming. The High/Scope Perry Preschool (i.e., Barnett, Young, & Schweinhart, 1998; Weikart, Bond, & McNeil, 1978) and Abecedarian studies (i.e., Campbell & Ramey, 1993; 1994;

Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002) were identified as having the strongest internal validity and resulted in statistically significant effects on reading achievement through adulthood. The High/Scope Perry Preschool Program study showed particularly strong effects at ages 14 and 19 on reading skills (i.e., Schweinhart & Weikart, 1997). The Abecedarian studies found statistically significant effects on reading through age 21. It should be noted, however, that the Abecedarian program in particular was much more intense than traditional preschool programming, with some interventions lasting from birth through age five. Clearly, the results of these comprehensive preschool programs demonstrate the power of intensive, high quality preschool programming on long term reading outcomes.

Both of these reviews (i.e., Barnett, 2001; Condry, 1983) point to the lasting success in reading that high quality preschool programming can promote in the future reading achievement of disadvantaged children. This research shows that high quality preschool classrooms promote numerous key skills and competencies, such as skills related to social-emotional development and emergent literacy, which support later school and reading success. To make a successful transition to kindergarten and to be on the trajectory towards competent academic skills, particularly skills related to reading, key skills related to emergent literacy must be acquired in preschool (Dickinson, McCabe, & Essex, 2006).

*Emergent Literacy: Oral Language, Phonological Awareness, Concepts of Print, and Alphabet Knowledge*

While definitions vary, emergent literacy is most often defined as the skills, knowledge, and attitudes that are the precursors to conventional reading and writing (Whitehurst & Lonigan, 1998). The concept of emergent literacy departs from more traditional views of reading in that the emergent literacy approach views literacy as a developmental process that begins early in the life of a child, rather than when the child begins formal schooling (Lonigan, 2004). Additionally, the emergent literacy perspective views reading, writing, and oral language development as occurring on a continuum both simultaneously and interdependently (Whitehurst & Lonigan).

Certainly, this view of literacy development calls attention to the importance of early childhood experiences, including those in the home and in preschool, as the skills developed in each skill area may interact to influence development in other areas.

This study adopts the emergent literacy theories proposed by Whitehurst and Lonigan (1998) and then updated by Storch and Whitehurst (2002) as the theoretical frameworks underlying the acquisition of emergent literacy skills. Whitehurst and Lonigan's (1998) original framework divides emergent literacy skills into two domains: "outside-in" and "inside-out" processes. These domains are interdependent; yet, the skills of each domain originate from different sources (e.g., experiences or direct teaching). Outside-in skills relate to the skills a child brings from outside of the instructional experience, meaning from experiences from home and early educational settings. The extent to which a child understands what he or she is reading relates to

outside-in skills. Broadly, the outside-in domain relates to contextual units, semantic units, and language units. Skills in this domain include receptive and expressive vocabulary, the ability to understand and produce narrative, knowledge about the conventions of print, and emergent reading (i.e., pretending to read). Outside-in skills refer to skills that fall outside of the child's ability to read the written word; rather, outside-in skills facilitate the child's understanding of print. The inside-out domain also includes units related to language; however, it also includes sound units, and print units. Skills falling under this domain are letter-name knowledge and letter-sound knowledge, phonological awareness, syntactic awareness, and emergent writing. These are skills that are generally thought of as being specifically taught. Clearly, strong reading skills require being competent in both of these domains.

Support for this model is provided by a study conducted by Whitehurst and Lonigan (2001). This study examined a group of preschoolers from low-income backgrounds. The researchers used structural equation modeling (SEM) to examine the relationships between outside-in and inside-out skills and the role these domains play on the path to later reading. The researchers found several conclusions providing direct support for this model. Inside-out skills and outside-in skills were found to be stable from preschool to kindergarten, indicating the degree of stability in these skills as children use these skills to learn to read. Additionally, preschool inside-out skills were found to predict second grade reading as strongly as first grade reading predicts second grade reading. Clearly, this finding highlights the importance of intentional instruction in these skill areas in the preschool. Lastly, it was found that inside-out skills and outside-

in skills were strongly correlated in preschool but become more differentiated in the upper grades. Again, this finding shows the impact the two domains of skills have on each other early one; however, inside-out skills are stronger predictors later on in the elementary grades. Other studies (e.g., Lonigan, Burgess, Anthony, & Barker, 1998; Lonigan, Burgess & Anthony, 2000) similarly provide support to the model though research with preschool samples.

Whitehurst and Lonigan's model (1998) was updated in 2002 by Storch and Whitehurst. The original model may have underestimated the independent contributions of oral language to early reading development (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003). In the updated model, Storch and Whitehurst continued to characterize two domains for emergent literacy skills; however, the domains were re-labeled to code-related skills and oral language skills. These new labels served to highlight the importance of oral language's role in later reading difficulties. The division of the two sets of skills for this model was based on research which hypothesizes that components of oral language could be statistically separated from phonological awareness, print concepts and emergent writing (e.g., Storch & Whitehurst, 2001; Whitehurst & Fischel, 2000) and the finding that while some language skills, such as phonological awareness, have a direct effect on early reading, oral language skills generally have an indirect effect on reading in the later grades (e.g., Roth, Speece, Cooper, & de la Paz, 1996; Speece, Roth, Cooper, & de la Paz, 1999; Storch & Whitehurst, 2002).

Specific support for the updated model is provided by Storch and Whitehurst (2002). The researchers studied a sample of low-income preschoolers through fourth grade in order to investigate the fit of the updated model of emergent literacy to preschool emergent literacy skills and later reading abilities. Measures were taken on the children's code-related and oral language skills. Conclusions drawn from this study indicate that, as in the previous model (Whitehurst & Lonigan, 2001), the relationship between the two domains of skills in preschool is strong and consistent over time. Additionally, beginning in preschool, code-related skills appear to be most related to early reading. In older elementary grades, reading accuracy and reading comprehension may be influenced separately by the two domains of skills. Reading accuracy may be most influenced by code-related skills. Reading comprehension, however, may be influenced by language ability, reading accuracy and prior reading ability. The finding that sets this model apart from the previous model is the conclusion that oral language does not make a direct contribution to reading in first and second grade, but may have a strong indirect effect. As reading becomes more automatic and comprehension becomes more important, oral language may have a stronger role.

Both the previous and updated model offer tremendous support for early, sustained and intensive intervention in both skill domains. Specifically, oral language and the code-related skills of phonological awareness, alphabet knowledge, and print awareness each have important roles in learning to read. The current study is modeled around this model of emergent literacy because of emphasis on the distinct early reading skills (e.g., letter knowledge, name writing, receptive language). This study examined

two code-related skills, letter knowledge and name writing, and one oral language skill: receptive vocabulary.

There are multiple other models of emergent literacy in the literature, and two other main models that have received ample attention. Scarborough's multiple strands of literacy model (Scarborough, 2001) initially divides reading skills into two divisions: language comprehension and word recognition. The language comprehension division includes skills that could be described as oral language skills (i.e., vocabulary) by Storch and Whitehurst (2002) as well as skills that relate to background knowledge, language structure, verbal reasoning, and literacy knowledge. The word recognition division includes phonological awareness, decoding, and sight recognition skills. Scarborough's model (2001) is unique in that it highlights the importance of the skills being woven together to result in skilled reading. In this model, early reading difficulties are related to the word recognition division of skills, and reading problems can develop and persist early in a child's life because of deficits with these skills. These problems can be compounded, however, if the deficits are not corrected and further deficits with language comprehension skills are accumulated as the child becomes older. This model of literacy is complimentary to the Storch and Whitehurst model (2002), but has a greater emphasis on the interdependence of the various skills as reading progresses. The current study placed a greater emphasis on the Storch and Whitehurst model because of the emphasis on the earliest of emergent literacy skills. Scarborough's model tends to emphasize the reading process and relationships between skills that occur after emergent literacy skills are in place.

A third model, the comprehensive language approach (Dickinson, et al., 2003), provides yet another perspective on literacy development, and places a greater focus on oral language in the early years. This model is described in the proceeding discussion on oral language; yet, it should be noted that this model was not used as a main model in this study because of ERF's interest in code-related skills. Oral language, however, was also assessed through receptive vocabulary in the current study in order to acknowledge the importance of oral language in early childhood.

*Oral language in preschool: direct and indirect effects.* Oral language skills have been shown to be predictors of reading achievement in elementary school (e.g., Biemiller, 1999; Catts, 1993; Storch & Whitehurst, 2002). Research shows that oral language is strongly correlated with code-related skills in young children (e.g., Scarborough, 2001; Tabors, Roach, & Snow, 2001). Bowey (1994), for example, found that skills related to oral language and other measures of emergent literacy (i.e., code-related skills), were significantly interrelated. Additionally, Lonigan, Burgess, and Anthony (2000) found that oral language in preschool had both direct and indirect effects specifically on phonological skills. However, through the elementary grades, the role of oral language appears to change. As children move from preschool to older grades, it appears that the influence of oral language wanes and then reappears stronger around third and fourth grades (Storch & Whitehurst, 2002). Dickinson and Tabors (2001) also found that measures of oral language were strongly related to reading skills in fourth grade through seventh grade.

There is, however, some controversy in the field regarding the role oral language plays on reading development. Dickinson et al. (2003) argue that the impact of oral language on emergent literacy and eventual reading has been underestimated. Dickinson et al. describes the original Whitehurst and Lonigan (1998) model as a phonological sensitivity approach (PSA) because of the contention that oral language, particularly vocabulary, is the basis for developing phonological sensitivity, but subsequently has less of a prominent role in reading development. The alternative perspective, put forth by Dickinson et al. is the comprehensive language approach (CLA). The CLA approach contends that a variety of oral language skills is important for emergent literacy and continues to play an important role throughout reading development. In sum, the importance of oral language has not been called into question by researchers. It has a critical role in reading development; however, it is the influence oral language has throughout reading development, as well as the indirect or direct nature of that influence, that continues to need further investigation. As previously mentioned, the current study does not adopt the CLA approach as the main theoretical model because of a desire to focus on code-related skills in young children, but the study does measure oral language (i.e., receptive vocabulary) in order to acknowledge the importance of oral language as an emergent literacy skill.

From among the subskills underlying oral language, vocabulary has a prominent role (e.g., Scarborough, 2001). The quantity of vocabulary heard by children has been shown to be the greatest source of variability when comparing low-income families to families of other socioeconomic statuses (National Research Council, 1998). Hart and

Risley (1992; 1995; 2003) showed in their study of 42 families the vast difference between the numbers of words heard by children of low-income versus middle income families. By age four, the children in families on welfare heard 13 million fewer words than the children of families not on welfare. The magnitude of this finding is highlighted when considering that a child's vocabulary at age three was predictive of the child's vocabulary at ages nine or ten. Leseman and de Jong (1998) also found that early vocabulary was not only related to later vocabulary but also to word decoding and reading comprehension at age seven. Scarborough (2001) found in a meta-analysis that kindergarten scores on both expressive and receptive vocabularies were predictive of later reading abilities (median  $r$  of .49 and .38, respectively). Because a child's vocabulary appears to be stable from an early age, it is especially important to note that for a child to have adequate reading comprehension beginning in third grade, he must have fluent word recognition skills and at least an average vocabulary (Biemiller, 2006). Additionally, it appears that vocabulary skills relate to the frequency of reading and attitudes about reading (National Research Council, 1998), both of which likely promote vocabulary growth through more exposure to reading in later years.

*Phonological awareness.* Phonological awareness refers to an awareness of the sound structure in the spoken word (Stahl & Murray, 1994). Tasks which involve rhyming, counting phonemes in spoken word, or matching initial word sounds reveal a child's ability related to phonological awareness. Phonological awareness, while a key emergent literacy skill, was not measured in the current study; however, a discussion on the skill's importance is warranted as part of the broader discussion on emergent

literacy. Phonological awareness in kindergarten has been shown by Scarborough's (2001) meta-analysis to be significantly correlated with later reading scores with a median correlation of  $r = .42$ . This may be because skills related to phonological awareness help young children to identify graphemes (i.e., letter or letter combinations that create a phoneme) and connect them to phonemes (i.e., the smallest unit of sound) (e.g., Bryant, Bradley, MacLean & Crossland, 1989; Bryant, MacLean, & Bradley, 1990; Vellutino & Scanlon, 2001). It must be noted, however, that evidence does not yet conclusively show a causal relationship between phonological awareness and later reading development; rather, it is most likely that there is a relationship between phonological awareness and reading development, but that it is a complex, bidirectional relationship (Castles & Coltheart, 2004). This point is supported by research demonstrating that adults and adolescents without a history of reading difficulties do not necessarily display full competence in the area of phonemic awareness, one of the most advanced skills under the umbrella of phonological awareness (Scarborough, Ehri, Olson, & Fowler, 1998). Regardless of the nature of the relationship, some relationship does exist between phonological awareness and reading ability (Castles & Coltheart; Scarborough, 2001) and the importance of phonological awareness is underscored by research indicating that interventions targeting this skill have important long term effects (Byrne & Fielding-Barnsley, 1991; 1993; 1995; Byrne, Fielding-Barnsley, & Ashley, 2000). Furthermore, phonemic awareness, a higher order component of phonological awareness, has been implicated as a major deficit area in older children with reading problems (Dickinson et al., 2003). In fact, deficits in phonemic awareness, decoding and

word sight recognition are associated with a large percentage of diagnosed reading disabilities (Scarborough, 2001). Although phonemic awareness does not generally occur until after children have the ability to read, and is not usually common among preschoolers, there does seem to be a general progression of skills related to phonological awareness (i.e., awareness of syllables, onsets and rimes, followed by awareness of phonemes) (Goswami, 2006). In sum, phonological awareness is an important emergent literacy skill that is predictive of later reading (Scarborough, 2001).

*Alphabet knowledge.* Knowledge of the alphabet, specifically naming of upper- and lower-case letters, was one of the strongest predictors (median  $r = .52$ ) of later reading scores in Scarborough's (2001) meta-analysis. The role alphabet knowledge plays in emergent literacy has generated several theoretical viewpoints. Adams (1990) suggested that letter knowledge may relate to understanding and being familiar with print and literacy-related processes. Others have suggested the ability to identify letter names may not be helpful to learning to read in isolation, yet a young child must know letter names before being able to know the sounds that each letter makes (i.e., knowledge of the alphabetic principle) (e.g., Mason, 1980). Some alphabet letters provide clues to their sounds simply by their names (Whitehurst & Lonigan, 1998) and research (e.g., Treiman, Tincoff, Rodriguez, Mouzaki, & Francis, 1998) has shown that children first learn letter sounds of letters which are similar to the letter name. Learning letter sounds from letter names may help facilitate the jump from alphabet knowledge to a grasp of the alphabetic principle. The alphabetic principle relates to understanding the relationship between letters and sounds (Martin, et al., 2007) and has been shown to be a centrally

important part of early literacy (e.g., Adams, 1990; Neuman, Copple, & Bredekamp, 2000; Stanovich, 1986).

Additionally, alphabet knowledge has been shown to assist in the development of some skills related to phonological awareness (e.g., Bowey, 1994; Johnstone, Anderson, & Holligan, 1996; Stahl & Murray, 1994), although the exact manner in which this occurs is not completely understood. It most likely is related to the aforementioned theory that some letters provide clues to their sounds by their names which facilitate sound recognition. Knowledge of letter sounds, in turn, may help children develop phonemic awareness by promoting the ability to pick out the letter sound in the letter name (Treiman, Cohen, Mulqueeny, Kessler, & Schectman, 2007). Although the manner in which alphabet knowledge specifically influences later reading continues to be researched, it is understood that letter name knowledge is an important code-related, emergent literacy skill.

*Print awareness.* Print awareness refers to the knowledge of the purposes and conventions of print (U.S. Department of Education, 2007a). Emergent writing, a print awareness skill, includes behaviors such as attempting to write letters, pretending to write, and learning to write one's name and is indicative of print awareness (Treiman, et al., 2007). Emergent writing is an area of emergent literacy which has received less research attention than other areas (DeBaryshe & Gorecki, 2007); yet, the existing research indicates that it is an important indicator of progress related to other emergent literacy skills. Whitehurst and Lonigan (1998, 2001) describe emergent writing as occurring on a continuum in which children in preschool eventually begin to use letters

to stand for different syllables, thus assisting children to understand the phonemes of words. Additionally, children begin to use “invented spelling” in which they use a phonological strategy to spell words. This process may help children begin to understand the alphabetic principle.

Name writing specifically has been shown to be related to other emergent literacy skills (Bloodgood, 1999; Welsch, Sullivan, & Justice, 2003). Welsch and colleagues found that the sophistication of name writing increased reciprocally with preschool children’s literacy knowledge. Children who could write their name were also the same children who had higher scores in the areas of rhyme, beginning sounds, uppercase letter knowledge, and concepts and function of print. More specifically, Treiman and Broderick (1998) found that name writing assisted children in recognizing the names of the letters in their name more often than other letters, although the children did not recognize the sounds of these letters more often. Furthermore, some researchers view name writing as one of the earliest emergent literacy behaviors (Welsch, et al.). Name writing may encourage children to use writing to communicate (Clay, 1975; Ferreiro & Teberosky, 1982; Martens, 1996), and may then encourage further emergent writing. Additionally, Badian (1982) found name writing to be one of the strongest predictors for later reading achievement. Clearly, emergent writing, is an important emergent literacy skill among young children even though it has not received as much research attention.

*Predictive power of emergent literacy skills on reading.* Recently, the National Institute for Literacy convened the National Early Literacy Panel to identify through meta-analysis which emergent literacy skills of young children most predicted later

reading outcomes and to what degree. According to preliminary reports, alphabet knowledge, phonological awareness, and name writing were among the skills that strongly predicted later reading outcomes while oral language skills and concepts of print also predicted later reading outcomes, although not as strongly (National Institute for Literacy, 2007). These results strongly confirm earlier results from the National Research Council's report *Preventing Reading Difficulties in Young Children* in 1998. The council concluded that phonological awareness was theoretically very important for learning to read but measures of its predictive power are muted because some young children have not yet acquired the skills that measure phonological awareness, but gain these skills as they develop. The council also found alphabet knowledge as a strong predictor and concepts of print as a moderate predictor of later reading skills. This knowledge indicates the importance of oral language and code-related skills both to emergent literacy and later literacy.

Emergent literacy skills do not occur in a vacuum. Rather, as discussed earlier, numerous contexts can significantly increase young children's vulnerability to difficulties in acquiring critical early literacy fundamentals. One context shown to powerfully impact development of emergent literacy skills is the home literacy environment (HLE). Research has shown factors in the home can powerfully influence the normal development of language and literacy acquisition. In the following discussion, different conceptualizations of the HLE will be addressed as well as the emergent literacy skills shown related to specific dimensions of the HLE. Additionally,

another component of young children's environment, the parent-child relationship, will be explored in relation to its relationship with emergent literacy outcomes.

### *The Home Literacy Environment (HLE)*

High quality early childhood education has the potential to improve and develop the emergent literacy skills of young children; however, emergent literacy occurs on a continuum that begins long before children enter into formal schooling (Whitehurst & Lonigan, 1998; 2001). Research shows that the experiences children have before formal schooling largely impact development of emergent literacy skills. Much of this research has focused on the HLE. The HLE has been shown to be "consequential" to successful acquisition of reading skills (Edwards, 2007). The HLE is often conceptualized in one of two ways: a focus on only areas related to literacy activities in the home or a broader focus on both literacy activities and other qualities that support child literacy. Earlier research into the HLE focused specifically on literacy activities in the family and found specific areas of literacy practices that occur in the home (see Anderson and Stokes, 1984; Wasik, 2004) such as literacy practices related to entertainment or daily living, as well as specific types of reading and writing that occur (i.e., Taylor & Dorsey-Gaines, 1988). This early research was among the first to categorize the HLE and describe literacy supports young children receive in their homes. More recent HLE conceptualizations include similar direct measures of literacy activities, but also include social-emotional and socio-economic measures that more broadly describe the HLE.

Because literacy in the home most frequently occurs as a social practice (Edwards, 2007), HLE conceptualizations have included domains that relate to the social

practices of families, such as the families' socio-economic status, the emotional climate of the home, and the value the family places on literacy and academic achievement. Additionally, because of the research showing the variations of the verbal interactions in the home are related to socio-economic status and are related to later literacy outcomes (e.g., Hart & Risley, 1995), conceptualizations have also included domains related to language.

Britto and Brooks-Gunn (2001), for example, divided the HLE into three domains: language and verbal interactions, the learning climate, and the social and emotional climate. Storch and Whitehurst (2001) also included three domains in their model: the literacy environment, parental characteristics, and parental expectations. In an attempt to create a unified conceptualization of the HLE and a manner in which to measure it, Burgess, Hecht, and Lonigan (2002) assessed several separate domains of the HLE including domains measuring shared-book reading, parental modeling of reading, parental abilities, engagement of children in literacy activities, and an overall HLE encompassing all of the domains. These three conceptualizations exemplify the movement to include broader domains (e.g., the emotional climate, parental expectations, and verbal interaction) in measures of the HLE.

Clearly, the HLE has been conceptualized differently over the years, and more recently the focus has been to develop a more encompassing HLE conceptualization that truly addresses the home aspects that affect a child's literacy development. Many studies of the HLE and of specific activities that occur in the home have measured the effect of these variables on emergent literacy outcomes of preschool children. It has been

established that the home is where children first encounter language and literacy and begin to participate in activities that foster their literacy development (DeBaryshe, Binder, & Buell, 2000). Additionally, research has shown that families of different income levels vary in the literacy environments they provide, with low-income families often providing less support in the form of activities and materials for literacy development (e.g., Aram & Levin, 2001; Farver et al., 2006; Storch & Whitehurst, 2002).

For clarity, the HLE is organized into the three domains reflecting the domains measured in the present study by the *Familia Inventory* (Taylor, 2000). The three domains are *Family Reading and Writing*, *External Resources*, and *Daily Activities*.

*Family Reading and Writing.* *Family Reading and Writing* consists of the following activities: shared reading by the family, shared writing by the family, practical reading in the home, and parental modeling of reading (Taylor, 2000). Studies have documented the relationship between these areas and emergent literacy skills (e.g., Landry & Smith, 2006; Whitehurst & Lonigan, 2001). Shared-reading has received more attention in the research than the other areas of these categories, which have generally received limited attention. Therefore, shared-reading and shared writing will be discussed together followed by a discussion of practical reading and parental modeling of reading.

There is a large literature base which looks at the effectiveness of shared-book reading in promoting positive emergent literacy outcomes. Shared-book reading has generally been defined as parents and children reading storybooks together (Sénéchal,

LeFevre, Hudson & Lawson, 1996). Shared book reading between parents and children has been associated with children's language development (Landry & Smith, 2006), particularly with vocabulary development (Whitehurst & Lonigan, 2001). Additionally, shared book reading accounts for unique variance in a child's vocabulary, even when factors such as the child's cognitive level are controlled for (Sénéchal, et al., 1996; Sénéchal, LeFevre, Thomas, Daley, 1998). While shared-book reading has not been conclusively shown to be related to phonological awareness (Sénéchal, et al., 1998; Whitehurst & Lonigan), a meta-analysis conducted by Bus, van IJzendoorn, & Pellegrini (1995) indicated that shared book reading affects the acquisition of a child's written register, although the effects appear to become less as a child becomes older. The meta-analysis also found that the effects of shared-book reading are not dependent on the socioeconomic status of a family; however, more families from middle income households report reading to their children daily than families from low income households (Baker, Scher, & Mackler 1997).

Shared writing has received less research attention than shared reading; yet, shared writing activities between parents and children have shown promising results. These types of activities have shown to be predictive of alphabet knowledge and skill (Aram & Levin, 2002). Specifically, one writing intervention for preschool children and parents was shown to be more effective at improving print concepts, including alphabet knowledge and word writing, than a shared book reading intervention (Aram & Biron, 2004). Shared writing interventions are clearly an area that needs more research and may be promising for family literacy interventions.

Parental literacy practices also contribute to literacy outcomes in children. Parents modeling that the printed word is interesting is part of home literacy (Pianta, 2004). Children whose parents emphasized the entertainment value of the printed word and reading had higher comprehension and word recognition scores in first, second, and third grade than children whose parents emphasized mainly the skill of reading (Baker, Sonnenschein, & Serpell, 1999). Other research has shown that children knew more about the alphabetic principle and other aspects of the written word if there was a literate adult at home who read at complex levels for leisure and entertainment (Purcell-Gates, 1996). This same study indicated that the print exposure in a home (e.g., magazines, books) was related to literacy outcomes. Additionally, storybook exposure, defined as both the frequency of books being read to children and the number of books in the home, directly predicted vocabulary and reports of reading for pleasure in kindergarteners and indirectly predicted reading comprehension in fourth grade (Sénéchal, 2006b).

Parent teaching of literacy-related activities while not directly assessed by the *Familia Inventory* (Taylor, 2000) is represented at the item level in each of three domains of the *Familia Inventory*. For example, some studies include measures of library use as part of parent teaching, and library use is covered in the *External Resources* domain of the *Familia Inventory*. As such, the effects of parent teaching will be discussed in the *Family Reading and Writing* domain, although it is measured across all three domains.

A parent teaching specific literacy skills to their children has been shown to be two times more effective than parents reading to their children and six times more

effective than simply encouraging parents to read to their children according to a recent meta-analysis (Sénéchal, 2006a). Additionally, kindergarten students whose parents taught them about literacy had higher scores in alphabet knowledge in kindergarten and reading fluency in fourth grade. Parent teaching, however, has been shown to be associated with written language skills, and not with oral language skills (Sénéchal, et al., 1998). In one study, joint parent-child literacy activities that may be considered parent teaching, such as reading aloud, visiting the library, providing picture books, engaging in rhymes, stories, picture drawing, and games, were associated with greater print knowledge and interest in reading, but not with written or oral language development (Weigel, Martin, & Bennett, 2006). These results were synthesized in the Burgess et al.'s study (2002) which found that the *Active* domain, which described direct parental efforts to engage children in literacy, was significantly related to most measures of emergent literacy. Likewise, Weigel et al. (2006) found that activities involving parent teaching were related to emergent literacy outcomes. Parental teaching of literacy skills appears to be a powerful influence on some aspects of emergent literacy outcomes and is an important area of the HLE to investigate. Clearly, the reading and writing that occur in a family through shared book reading, shared writing, and parental literacy practices and teaching help young children develop emergent literacy skills.

*External resources.* The *External Resources* domain of the *Familia Inventory* (Taylor, 2000) is defined as the activities and support of activities taking place outside of the home and the extended family members involved with the children. The domain includes parental support of school, support by extended family, and the library use by

the family. Each of these areas has received some degree of attention in the research. It is clear from research that family involvement contributes to children's literacy outcomes (Edwards, 2007). Specifically, the beliefs parents have about literacy and literacy-related practices appear to have a relationship to the reading-related outcomes of young children. Parental beliefs about the importance of literacy and the importance of their involvement in their children's literacy are related to how often parents read with their children and the quality of these readings (DeBaryshe, 1995) as well as to the quality of the HLE (Bingham, 2007) and the literacy-related opportunities available to children (Sonnenschein, Baker, Serpell, & Schmidt, 2000). In an exploratory study, DeBaryshe, et al., (2000) showed that mothers of 5- and 6- year-olds tended to have beliefs about early literacy instruction that fell into three categories: the belief in a whole-language approach, a belief in a phonics approach, or beliefs that did not fall into either of these categories. The children whose mothers' views fell into this third category had less developed literacy skills. This seems to indicate that beliefs and support of literacy in some way are more productive to literacy development than not having any firm beliefs about literacy. A family's support of school and literacy most likely contributes to many positive outcomes for children, and research shows that emergent literacy is an area in which this type of support is important (e.g., DeBaryshe, et al.; Edwards).

A recent study (Gonzalez & Uhing, 2008) using the *Familia Inventory* (Taylor, 2000) showed that the *Extended Family* subscale was positively associated with the Spanish oral language outcomes of preschool Hispanic children. The researchers

hypothesize that the extended families often present among populations such as Mexican Americans serves to assist children in the development of knowledge and skills, including the skills necessary for literacy development. This is an important finding because of the ways in which family literacy programs and government policy can incorporate extended families into programs.

Several researchers have shown that the frequency of visits to the library of a family is related to emergent literacy outcomes (Payne et al., 1994; Sénéchal, et al., 1996). In the study by Sénéchal, et al. (1996), the number of books in the home and library visits were both shown to be related to children's vocabulary, but when print exposure was controlled for, it was found that only the frequency of library visits was actually related to the vocabulary outcomes. Most recently, Gonzalez and Uhing (2008), using the *Familia Inventory* (Taylor, 2000), found that the frequency of library visits accounted for 15% of the variance in English oral language in a sample of low-income Hispanic children. The researchers emphasize the need for more accessibility to libraries among similar populations and provide important recommendations to libraries including the recommendation of providing bilingual services. Visiting the library most likely is indicative of a higher value being placed on literacy by the family. As more research investigates the frequency of library use, this component of the HLE may receive more attention from family literacy programs.

*Daily activities.* The *Daily Activities* scale of the *Familia Inventory* (Taylor, 2000) is defined as the activities taking place in the home that may support literacy and includes television and media use by the family, verbal interaction, rhyming and singing

by the family, and shared work and play by the family. Research has clearly investigated the first two areas, and shared work and play by the family falls under the affective environment in the home, a topic to be discussed in relation to the parent-child relationship.

Television viewing patterns and characteristics have been studied in relation to young children's school readiness outcomes. School readiness outcomes generally include measures of emergent literacy. In one study, Clarke and Kurtz-Costes (1997) researched the relationship between television viewing habits, the educational environment of the home, parental employment status and child outcomes on school readiness and intelligence. It was found that the amount of time spent watching television was negatively related to the children's school readiness outcomes. The authors suggested that the amount of viewing of television is harmful to children not necessarily because of harm to cognitive development, but because the time spent watching television is not being spent in a more educationally enriching manner.

In another study regarding television viewing patterns and school readiness, Wright, et al. (2001), studied the relationship between viewing habits and performance on outcomes of reading, math, receptive vocabulary and school readiness over three years. The authors concluded that children who watched child-audience informative programs (e.g., *Sesame Street*) at ages two and three had greater school readiness outcomes as well as greater outcomes on the other measures. This same effect was not found for children who watched the programs at older ages. For 2 and 3-year-old children who watched cartoons more frequently, results indicated lower scores on

receptive vocabulary, although again this effect was not found for older children. Children of all ages who frequently watched general-audience programs performed lower on most measures. The results of the study add support to the idea that the content of television programs should be carefully monitored by parents of young children. These studies are among the few investigating television and media use on the emergent literacy outcomes of young children. Generally, it appears from these studies and others (e.g., Bus & van IJzendoorn, 1988) that television viewing as a substitute for other literacy activities (e.g., shared book reading) may inhibit optimal development.

The importance of verbal interaction to the development of emergent literacy skills has previously been described in the discussion on oral language. In brief, verbal interaction has been shown to be substantially less and of a lesser quality in families of low-income compared to families of higher incomes (Hart & Risley, 1995; Tabors, Roach, & Snow, 2001). Additionally, the variance in verbal interaction has been shown to be related to emergent literacy outcomes (Beals, 2001; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991). Verbal interaction in the form of rhyming and singing is also related to emergent literacy outcomes. Bennett, Weigel, and Martin (2002) found that emergent literacy outcomes improved when families sang songs, recited rhymes, told stories, drew pictures, and played other games. The same researchers found in a later study that the more often parents engaged in such activities, the higher the children's literacy and language scores were (Weigel, et al., 2006). Baker, et al. (1997) also found that parents reported that their children enjoyed these activities and that these activities were related to emergent literacy outcomes. The third area of the *Daily Activities*

domain, shared work and play by the family, has not received much coverage in the literature. This study will aim to provide more insight and research into this area of the HLE.

### *The Parent-Child Relationship*

As previously mentioned, conceptualizations of the HLE are beginning to include measures of the warmth in the home and the relationship between parent and child (e.g., Britto & Brooks-Gunn, 2001; Burgess, et al., 2002). This is an important dimension to investigate as at least one study has shown that characteristics of the parent-child relationship may be better predictors of emergent literacy outcomes than the HLE (i.e., Dodici, et al., 2003). The parent-child relationship is thought to support literacy development in several ways. First of all, the relationships between parents and children occur in a social context. Learning occurs in this social context, and the child carries these experiences to their earliest experiences in school. Pianta (1997) suggests that when parents provide a positive social context, children are able to be more successful with learning in the social context of school. The National Research Council and Institute of Medicine suggested in their report *From Neurons to Neighborhoods* (Shonkoff & Phillips, 2000) that every achievement of a young child, from language and literacy to social-emotional development, occurs in the context of the relationships with those in the parenting role. This tenet appears to be true in light of evidence suggesting that the relationship between a parent and a child is a strong and consistent predictor of both academic and behavioral outcomes in kindergarten children (Pianta, Nimetz, & Bennett, 1997). Several areas of the association between the parent-child relationship

and academic outcomes have received the bulk of research attention, namely, parenting styles, parent-child attachment, and parental warmth and responsiveness. Research connecting parenting styles and early emergent literacy is lacking; however, research looking at practices and characteristics that promote positive parenting styles, such as attachment, warmth, and responsiveness, have been connected to emergent literacy outcomes.

In relation to literacy, the quality of attachment between parent, particularly mother, and child has been studied with regard to interactions during shared book reading. It has been found that children in secure relationships with their mothers are more attentive during shared book reading than children in insecure relationships (Bus & van IJzendoorn, 1997). Additionally, mothers and children in secure relationships focused more on formal aspects of written language such as reading instruction (Bus & van IJzendoorn, 1988). The frequency of book reading is also higher in relationships classified as secure in both high and low-income groups (Bus & van IJzendoorn, 1995).

Positive interactions between mothers and children have also been associated with positive academic outcomes (e.g., Morrison, Rimm-Kauffman, & Pianta, 2003; Pianta & Harbers, 1996). Research looking at interactions has examined a wide range of parent-child characteristics including attention, guidance, responsiveness, warmth and language. All of these areas contribute to attachment and to the parent-child relationship in general (Pianta & Harbers, 1996). The quality of interactions between young children and mothers has been shown to be related to early language skills and other emergent literacy skills, such as phonemic analysis (Dodici, et al., 2003; Kelly, Morisset, Barnard,

Hammond, & Booth, 1996). Furthermore, the quality of interactions may have lasting effects. Pianta and Harbers (1996) showed that higher quality interactions during a problem-solving task at school-entry were related to better academic outcomes in second, third, and fourth grades. In a follow-up study, it was the quality of the early mother-child interaction that accounted for a unique variance in social and academic success in adolescence, even when demographic variables were accounted for (Morrison, et al.). Interactions are most likely a window into the parent-child relationship and may not uncover all of the variables in the relationship; however, research shows that positive interactions are related to academic, and specifically, literacy outcomes (e.g., Dodici, et al.; Kelly, et al.).

The manner in which a parent responds to a child has also been linked to cognitive outcomes (Landry, Smith, Swank, Assel, & Vellut, 2001). For example, higher parental responsiveness has been shown to be associated with accelerated vocabulary growth (Landry & Smith, 2006). The importance of being consistently responsive to children also appears to be vital for optimal cognitive and academic outcomes. One study found that consistent responsiveness was associated with faster cognitive development, particularly among children who were born pre-term (Landry, et al.). The same study found that if consistent responsiveness was removed during the preschool years, the same rates of cognitive growth may not be sustained.

The importance of responsiveness is shown when looking at outcomes more specific than general cognitive outcomes. Tamis-LeMonda, Bornstein, and Baumwell (2001) found that mothers' responses to children's verbalizations and play before the age

of two predicted the developmental timing of 4 out of 5 language milestones.

Responsiveness most certainly refers to more than just being verbally responsive; yet, verbal responsiveness has been studied more often and been found to be associated with reading and language outcomes (Coates & Lewis, 1984; Taylor, Anthony, Aghara, Smith, and Landry, 2008). The proximal and verbal responsive nature of a mother's voice to her young child has been shown to be related to reading performance when the child was six (Coates & Lewis). The most recent research in this area confirms and extends on these findings. Taylor, et al. found that patterns of maternal responsiveness during infancy and preschool predicted reading comprehension at eight years of age. Additionally, the relationship between responsiveness, particularly responsiveness in infancy, and reading comprehension was stronger for children who had compromised cognitive abilities. Clearly, this finding highlights the need for responsive parenting to promote positive literacy outcomes, particularly for at-risk children.

Limit setting is also an area of parenting that has been examined in relationship to child outcomes, although typically emergent literacy outcomes have not been examined directly. Barth and Parke (1993) found that parent-child relationships in which the parent was classified as controlling and the child was classified as resistant or directive were negatively associated with school adjustment to kindergarten. This study seems to indicate that a controlling parenting style may hinder optimal adjustment to school. However, Conner (2000) found that the practice of limit setting positively influenced the personal and social development of preschool children which then positively influenced readiness to learn. It may be that limit setting is a more positive

parenting practice than being controlling. Research has also shown that there is a complex relationship between these parenting characteristics and literacy outcomes (e.g., Morrison & Cooney, 2002); yet, the amount and nature of control and limit setting to optimally support academic and literacy development is not well understood.

Emotional support and warmth in the parent-child relationship and the home are other components of a child's affective environment that have been studied in order to examine associations between these dimensions and the child's cognitive and academic outcomes. "Maintaining" has been defined as a part of emotional support that shows children that their interests are important and encourages sustained attention, but does not place unrealistic demands on a child's attention and cognitive abilities (Landry & Smith, 2006). It has been found that "maintaining" supports young children's cognitive skills; yet, two other components of emotional support, social independence and directiveness, were found to be associated with cognitive skills at an early age, but negatively associated with the skills at 4 ½ years of age (Landry, Smith, Swank, & Miller-Loncar, 2000).

Relationship warmth and warmth in the home has also been associated with academic skills. As perceptions of mother-child warmth increases, for example, it has been found that family involvement with the school and academic achievement also increases (Simpkins, et al., 2006). In general, the social and emotional climate of the home, and particularly the warmth in the home, has been shown to be associated with school readiness skills and moderately associated with expressive language (Britto & Brooks-Gunn, 2001). Parental nurturance, defined as a warm and affectionate parent-

child relationship, has been found to contribute significantly to reading growth between the ages of four and eight (Merlo, Bowman, & Barnett, 2007). Morrison and Cooney (2002) looked at both responsiveness and warmth in relation to early literacy skills and found that both of these parenting characteristics were related to children's development of social skills, which were related to literacy and academic outcomes. These parenting characteristics appeared to have an indirect, but important, effect on these early literacy outcomes.

This body of research highlights the importance of the parent-child relationship in relation to skills that support emergent literacy skills. Additionally, it appears that children who have positive and warm relationships with their caregivers excel faster in their literacy development (e.g., Merlo, Bowman, & Barnett, 2007). Research has investigated key areas of the parent-child relationship; yet researchers (e.g., Pianta, 2004) continue to call for more research to provide a more comprehensive picture of the impact of adult-child relationships on developmental outcomes, such as those related to literacy development. The present study will investigate the parent-child relationship through the use of the *Parent-Child Relationship Inventory (PCRI)* (Gerard, 1994). The *PCRI* was used in the current study because it is a self-report measure and one of the only assessments that does not require standardized observations in the home environment, a procedure that would not have been possible in the school district housing the ERF program.

### *Summary*

Children in the United States, particularly minority students, are experiencing unprecedented rates of reading difficulties (e.g., National Center for Educational Statistics, 2007). While research has documented the essential skills preschoolers need to be able to read, many children, especially diverse learners, fail to optimally achieve them. Research has also shown that high quality preschool environments can help mitigate the effects of being at high risk status by using targeted instruction on important precursor reading skills. Additionally, it has been demonstrated that while the enriching environment of preschool can improve reading-related outcomes (e.g., Barnett, 2001), the home environment of young children also has a strong impact on emergent literacy outcomes (DeBaryshe et al., 2000). Several aspects of the home environment, namely the literacy environment and the parent-child relationship, have been shown to be related to emergent literacy development in young children. Research on the variance in emergent literacy outcomes accounted for by the home literacy environment (HLE) and the parent-child relationship should continue to be developed in order to provide guidance for research and practice in working with families and young children. The purpose of this study was to investigate the extent to which emergent literacy outcomes can be predicted by three dimensions of the HLE by using canonical correlational analysis (CCA) in the second year of a preschool program. The second purpose was to use commonality analysis to determine the unique and common variance in emergent literacy outcomes accounted for by the HLE and the parent-child relationship. The specific emergent literacy outcomes to be examined are oral language, alphabet

knowledge, and print concepts, which are the skills emphasized by Early Reading First enriched classrooms.

### *Research Questions*

The interrelations between the domains of the HLE and the emergent literacy outcomes were assessed in this study with a canonical correlation analysis (CCA). Additionally, this study used commonality analysis to determine the unique and common explained variance in emergent literacy outcomes accounted for by three domains of the HLE and the parent-child relationship. The following four questions were addressed:

1. To what extent can emergent literacy outcomes (receptive vocabulary, print concepts, and alphabet knowledge) be predicted by dimensions of the HLE (*Daily Activities, External Resources, Family Reading and Writing*)?
2. What is the shared and unique variance in English receptive vocabulary outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?
3. What is the shared and unique variance in print concept outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?
4. What is the shared and unique variance in alphabet knowledge outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?

It was hypothesized that there will be a significant and positive interrelationship between the domains of the HLE and emergent literacy outcomes. It was hypothesized that the

HLE and parent-child relationship would have both shared and unique contributions to the variance in oral language, print concepts, and alphabet knowledge.

## CHAPTER III

### METHOD

#### *Participants and Context*

The study was conducted using a sample of 122 preschool children enrolled in ERF enriched preschool classrooms in one school located in a Southwestern state. The school district serves approximately 13,000 students with a population of 24.7% African American, 46.3% Hispanic, and 28.5% White. Approximately 95% are considered economically disadvantaged and receive free or reduced lunch. The children in the current study were preschool students in the second year of implementation of the ERF enrichment program. The children were of different ethnic backgrounds, with the majority of the children being Hispanic. The term “Hispanic” has been used in the review of literature and in describing the sample because it is the term used by the U.S. Census Bureau to describe people whose origins are from Spain, the Spanish-speaking countries in Central and South America, or the Dominican Republic (U.S. Census Bureau, 2009). The total sample of 122 included 62 females (50.82%) with the ethnicity of participants being 66.39% Hispanic, 18.03% African American and 13.93% Caucasian. More than half (i.e., 55.74%) of the students were considered English Language Learners (ELL) which in this sample indicated that they spoke Spanish as their first language. All students qualified for free or reduced lunch. It should be noted that due to various reasons, such as absences, test refusal, and moving, there were different sample sizes for each measure. This will be discussed in more detail in the results section.

### *Instructional Context*

Because the current study took place in the context of an ERF project and the children involved were involved in an intensive and intentional preschool curriculum, a brief discussion of this context is presented. Emergent literacy skills were a major focus of the preschool program.

*Teachers.* All of the teachers ( $n = 8$ ) participating held a bachelor's degree and were certified as early childhood or elementary educators. The mean years of teaching was five years and the mean years at the present school was two years. Five of the teachers held bilingual certifications, one teacher held a special education certificate, and one teacher held an English as a Second Language certificate. The teachers received significant amounts of professional development, averaging approximately 75 hours during the school year.

*Federal ERF program objectives.* Students in the ERF enriched classrooms received integrated instruction in the four areas identified in the *Guidance for the Early Reading First Program* document (U. S. Department of Education, 2007a): oral language, phonological awareness, alphabet knowledge, and concepts of print. The curricula, instructional content, and classroom practices were organized to prepare children to enter kindergarten ready to learn. Classrooms were arranged to provide children with cognitively stimulating opportunities using high-quality language and print-rich materials.

*Classroom instruction.* The ERF project employed a multi-tiered framework (Fuchs & Fuchs, 2006; Fuchs, Mock, Morgan, & Young, 2003; Gresham, 2007). The

*Scholastic Early Childhood Program* (SECP) was the class-wide curriculum selected to address the majority of the children's language and literacy needs through its focus on language and literacy, integration with mathematics, social studies, arts, physical development, and personal and social development (Block et al., 2008). The SECP core curriculum was supplemented with *Let's Begin with the Letter People®* (Abrams & Company, 2000). *Let's Begin with the Letter People®* is an early education curriculum that uses thematic units to develop children's language and literacy skills. A major focus is phonological awareness, including rhyming, word play, alliteration, and segmentation. Children are encouraged to learn as individuals, in small groups, and in a whole-class environment.

Children who needed more differentiated and individual instruction also received the *Building Language for Literacy* curriculum (Neuman, Snow, & Canizares, 2008). This curriculum is a research-based intensive program specifically focusing on systematic letter/sound instruction, writing, and reading of high frequency words.

*Home visiting program.* To extend and complement classroom instruction, the ERF school adopted a home visiting program modeled after the Parents as Teachers (PAT) Born to Learn™ model (Parents as Teachers, 2008). The school's PAT program had four goals: (a) to increase or supplement parent knowledge of childhood development and improve parenting practices, (b) to promote early detection of delays and health-related issues, (c) to prevent child maltreatment and neglect, and (d) to enhance children's school readiness for schooling success (Parents as Teachers, 2008). Trained parent educators made a minimum of one visit per month using the PAT *Born to*

*Learn*™ curriculum. During home visits, parent educators modeled and coached age-appropriate games, activities, and other literacy activities with toys and books gifted to the parents. For example, in one activity, home visitors read with the children to model shared-book reading for the parents. In addition, parents were invited to participate in 26 site-based meetings in which they were provided with structured activities to build knowledge of developmentally appropriate parenting, and to participate in recreational and educational outings (e.g., fire station, library, zoo). One site-based meeting involved a neighborhood police officer as a special guest who talked to the families about safe family activities and other safety procedures.

### *Measures*

The ERF program mandated documented use of instructionally relevant assessments to screen and monitor preschool student progress in developing the language and literacy skills needed for later reading success. Students were individually screened in the Fall of 2007 and Spring of 2008 using the *Peabody Picture Vocabulary Test-III (PPVT-III)* (Dunn & Dunn, 1997) and the *Name Writing and Alphabet Knowledge* subtests of the *Pre-kindergarten Phonological Awareness Literacy Screen* (Pre-K PALS: Invernizzi, Sullivan, Meier & Swank, 2004). The variables related to the home literacy environment and the parent-child relationship were measured in the Fall of 2007 and included the *Parent-Child Relationship Inventory (PCRI)* (Gerard, 1994) and the *The Familia Inventory* (Taylor, 2000). The *PCRI* measures the affective aspect of the parent-child relationship focusing on the beliefs and attitudes of the parent toward parenting and towards their child. *The Familia Inventory* measures the literacy supports

available to a child in his or her home environment. The two measures are similar only in that they measure some aspects of parental beliefs and activities. *The Familia Inventory*, however, measures only those beliefs and activities directly relating to literacy while the *PCRI* measures more general parenting areas and does not specifically address literacy. All measures were individually administered by trained university graduate students and school personnel and teachers. The *PPVT-III* and the *Pre-K PALS* took approximately 30 minutes to administer and were administered in quiet classrooms at the elementary campus. If the testing environment was determined to be too loud or distracting, testing was resumed the following day in a more suitable environment. The *Familia Inventory* and the *PCRI* each took approximately 20 to 30 minutes to complete during the home visits. The parents filled out the assessments individually, and the home visitor offered to read each assessment out loud to the parent if the parent desired. The home visitor offered this option to each parent, regardless of the home visitor's knowledge of the parent's reading ability. The home visitors estimated that about half of the parents accepted the offer to have the assessment read to them. Each test protocol was scored twice, once by the individual who conducted the initial assessment and a second time by another examiner or project member. Any discrepancies in scoring were resolved through a third examiner or a senior project investigator to 100% agreement. A second data entry specialist reviewed the data-base for entry errors and resolved any differences through discussion with the primary data entry specialist. All data collectors received training prior to data collection that included time for practice to mastery. Training involved training session by an expert with each test. Training materials

included test manuals, training multimedia materials, and practice protocols.

Additionally, test administrators were observed during their first several administrations and at subsequent random intervals.

*Phonological Awareness Literacy Screening Pre-K.* The *Phonological Awareness Literacy Screening Pre-K* (*PALS Pre-K*; Invernizzi, et al., 2004) is a scientifically-based phonological awareness and literacy screening that measures preschooler's developing knowledge of important literacy fundamentals and offers guidance to teachers for tailoring instruction to children's specific needs. In the evaluation of this ERF program, the *PALS Pre-K Name Writing* and *Alphabet Knowledge* subtests were used. *Name Writing* consists of the teacher asking the child to draw a self-portrait and to write his/her name. *Name Writing* is scored on a developmental continuum, ranging from scribbles to the use of mixed symbols to writing the entire name correctly. For *Alphabet Knowledge*, the teacher asks the child to name the 26 upper-case letters of the alphabet presented in random order. Children who know 16 or more upper-case letters also take the lower-case alphabet recognition task. Children who know nine or more lower-case letters are also asked to produce the sounds associated with the 23 letters and three consonant digraphs. Combined, both tests take approximately 10 to 15 minutes to administer. The development of the *PALS Pre-K* involved a thorough review of emergent literacy research, four separate pilot studies, and reliability and validity studies. The inter-rater reliability of both scales used in the current study was .99 (Invernizzi et al., 2004). Content validity was assessed by an expert panel of researchers and professionals in the emergent literacy and early

childhood fields and a factor analysis was completed to ensure adequate construct validity. Concurrent validity ranged from .41 to .71 with other measures of emergent literacy skills, including the *Test of Awareness of Language Segments (TALS)*, *The Child Observation Record (COR)* (1992), and the *Test of Early Reading Ability (TERA-3)* (2001). The authors of the *PALS Pre-K* also completed a longitudinal study to ensure predictive validity. Predictive validity estimates ranged from .53 to .56 (Invernizzi et al.). Students in the current study were assessed with the *Alphabet Knowledge* and *Name Writing* subtests twice during the school year.

*Peabody Picture Vocabulary Test, Third Edition. The Peabody Picture Vocabulary Test (PPVT-III:* Dunn & Dunn, 1997) is recommended for use in educational and clinical settings to measure receptive vocabulary and to screen for English language ability and general language development. On the *PPVT-III*, the child is required to point to one of four pictures on a panel that represents an object or action named by the examiner. The test consists of 204 progressively more difficult items, recommended for ages 2 through 99 and generally takes 10 to 15 minutes to administer. The *PPVT-III* yields both deviation-type and development-type normative scores (Dunn & Dunn). The deviation-type scores include standard scores, percentile ranks, normal curve equivalents, and stanines. For the current study, the scores used are age-based standard scores ( $M = 100$ ,  $SD = 15$ ). Reported alpha and split-half reliability coefficients are in the range of 0.86 to 0.98 for both forms A and B (Dunn & Dunn). The normative sample for the *PPVT-III* was comprised of 2,725 individuals between the ages of 2  $\frac{1}{2}$  and over 90 years of age and was selected to match the population of the United States. Reliability

for the *PPVT-III* is satisfactory with the median reliability coefficient equaling .94.

Validity information is provided for the previous edition of the *PPVT-III* and suggests the previous edition correlates well with other vocabulary tests and moderately well with measures of verbal ability (Dunn & Dunn). Students are assessed with the *PPVT-III* twice during the school year.

*Parent-Child Relationship Inventory (PCRI)*. The *PCRI* (Gerard, 1994) is a self-report questionnaire developed to measure the attitudes and beliefs of parents to parenting and to their children and takes about 20 to 30 minutes to take. The *PCRI* has been used in a variety of settings and with diverse populations including substance-abusing mothers (Suchman, Rounsville, DeCoste, & Luther, 2007), parents involved in parent training programs (Suchman, McMahan, & Luther, 2004; Landy & Menna, 2006), Latino adolescents and parents participating in a mentoring program (Barron-McKeagney, Woody, & D'Souza, 2002), and parents who used fertility treatments to have children (Braverman, Boxer, Corson, Coutifaris, & Hendrix, 1998). Additionally, the *PCRI* has been used to quantify the effect of parental behavior on preschool-aged children's readiness to learn (Conner, 2000). The study by Conner (2000) is the most relevant to this study in the way in which the *PCRI* was used. Connor measured preschool children's personal-social development and language development. Personal-social development is assessed by the children's ability to perform such tasks as washing hands, naming a friend, and playing a game. The language development is measured by the children's ability to combine words, use understandable speech patterns, define five words, name four colors and name two opposites. Results indicated that parents' scores

on the Limit Setting Scale was a significant predictor of preschool children's language development. Interestingly, scores on the Limit Setting Scale were also correlated with social-emotional development. Other scores were not significant predictors of development, which could have been the result of a small sample size.

The *PCRI* includes 78 items that comprise seven scales: *Parental Support*, *Satisfaction with Parenting*, *Involvement*, *Communication*, *Limit Setting*, *Autonomy*, and *Role Orientation*. The measure yields raw scores and T-scores. The standardization sample for the *PCRI* was made up of 1,100 mothers and fathers from four major geographic areas in the United States. The participants in the norm sample were parents to children who ranged in age from less than three years of age to greater than 13. The sample was generally more educated than average and was not as diverse as the population of the United States (Gerard, 1994). The *PCRI* manual indicates that the measure has good reliability (median alpha  $r = .82$ ) and validity as measured by a confirmatory factor analysis of the subscales and the moderate correlation between subscales (Gerard). In addition, outside studies have found the *PCRI* to be a reliable and valid measure (Coffman, Guerin, & Gottfried, 2006; Heinze & Grisso, 1996). Home visitors involved in the Early Reading First enriched school and graduate students administered the *PCRI* to families once, in the fall of 2007. Families who completed the *PCRI* received a coupon for a free, large pizza.

*The Familia Inventory.* The *Familia Inventory* (Taylor, 2000) is a 57-item questionnaire with two forms designed for use by family literacy programs and takes approximately 20 to 30 minutes to take. The *Familia Inventory* is one of the only

commercially-available assessments of the HLE that is a self-report measure. The measure assesses three general areas of family interactions central to literacy: shared family activities in the daily routine, shared family reading and writing activities, and family use of external resources. The inventory also includes 10 subscales that comprise the three areas of the HLE assessed; however, this study will only use the three major areas as units of analysis. The normative sample included 1,398 individuals who were selected to generally be representative of the population of the United States according the 1990 Census. It should be noted that although the sample is described as “representative”, further description or detail on the sample is not provided. The *Familia Inventory* manual reports satisfactory reliability between the two forms (.79) and has demonstrated an inter-item correlation of .93 (Taylor). In a sample of 48 families enrolled in Wyoming Even Start programs, the Cronbach’s alpha coefficient reliability estimates for the subscales of the *Familia Inventory* ranged from .78 to .93. In a different sample drawn from Iowa Even Start programs, Cronbach’s alpha for form A was .95 ( $n = 97$ ) and was .90 for form B ( $n = 29$ ). Evidence of validity centers upon content validity as measured by family literacy research. Further evidence of reliability and validity has not been provided by the author; however, recently the *Familia Inventory* was used in a study examining the HLE of preschool Hispanic children (Gonzalez & Uhing, 2008). These researchers noted positive relationships between several subscales of the inventory and found domains covered by the HLE to account for unique variance in oral language outcomes. Any interpretations emerging from the use of the inventory must be tempered by the instruments weaknesses. To begin with, the user’s manual does not

provide sufficient information about the demographic information of the sample.

Additionally, information is not provided about how reliability statistics were calculated and information about validity is not sufficient.

Home visitors involved in the Early Reading First grant and graduate students administered the *Familia Inventory* to families twice a school year, although the current study will only use the first collection taken in fall of 2007. The *Familia Inventory* is appropriate for both literate and low-level readers and was administered by a bilingual administrator when necessary. Additionally, for parents who were non-readers, the inventory was read to the parents.

#### *Data Analysis*

*Canonical correlation analysis.* Canonical correlation analysis (CCA) was used to answer the first research question investigating the extent to which emergent literacy outcomes (i.e., alphabet knowledge, print concepts, oral language) could be predicted by HLE variables (i.e., *Daily Activities*, *External Resources*, *Family Reading and Writing*). The scores obtained from the *PCRI* were not used in the CCA because the sample size for this assessment was not large enough for this type of statistical analysis (Thompson, 2000). The use of CCA is important to the current study because the use of a multivariate method such as this helps to control for experiment-wise or Type I error (Thompson). Additionally, canonical analysis provides valuable information about the interrelations between the two sets of variables in the current study (i.e., the HLE variables and the emergent literacy outcomes). CCA is a valid choice for statistical

analysis when variables clearly fit into two groups and the study aims to investigate the nature of the relationship between the two groups, as in the current study.

In order to investigate the interrelationship between two sets of variables, CCA creates canonical functions and will extract as many functions as the smallest number of variables. For the current study, there were three variables in one variable set (*Daily Activities, Family Reading and Writing, and External Resources*) as well as three variables in the second variable set (alphabet knowledge, print concepts, and oral language), so three canonical functions were extracted. Before interpreting functions, *p*-values and Wilks' Lambda values are examined for statistical significance. If no significance is found, the functions and other scores do not need to be interpreted as there is no significant relationship between the variable sets. The purpose of the canonical function is to enable synthetic scores to be derived by applying the functions to observed scores. Synthetic scores are an estimate of the latent construct and CCA determines the linear combinations of the synthetic scores that are maximally correlated (Thompson, 2000). The interrelationships are thus interpreted by measuring the relative contribution of each variable to the canonical functions that are extracted (Thompson). If the CCA resulted in significance, the current study would investigate the structure coefficients, which are the Pearson product-moment correlation between the scores on the measured variable and the synthetic variable, and the canonical correlation coefficient, which is the Pearson product-moment correlation between two sets of the synthetic variables scores for a canonical function (Thompson, p. 310-311). CCA would

thus provide more information about the HLE as it relates to all of the measured emergent literacy outcomes.

Of the 122 participants, 40 did not have complete data for the CCA. For example, some participants had missing scores on a scale of the *Familia Inventory* (Taylor, 2000) and four participants had missing data on the *PPVT-III* (Dunn & Dunn, 1997). The data is considered missing completely at random (MCAR) because the “missingness” is considered unrelated to variables in either set. In order to account for missing data, three strategies were employed for the CCA in order to determine the effect the missing data had on the results. Initially, listwise deletion was employed. Listwise deletion removes any case with missing data (Buhi, Goodson, & Neilands, 2008). The CCA was first run with listwise deletion. Next, mean imputation was used with the complete data set. Mean imputation computes the mean of each variable and uses the mean as a replacement for missing data; thus, the complete data set can be used (Buhi, et al.). The CCA was run once again with mean imputation being employed. Lastly, multiple imputation was used with the complete data set. Multiple imputation creates multiple data sets, replacing missing data points with imputed values varying in value. For the current data set, five data sets were created to arrive at a total of 610 cases. The CCA was then run with each of the five data sets in order to arrive at a range of *p*-values and Wilks’ Lambda values for comparison. Multiple imputation has advantages over the mean imputation, with the most prominent advantage being that it lowers the probability that the variance in scores will be artificially lowered (Buhi, et al.).

Following the multiple imputation method for missing data, it was discovered that significance was not reached with the CCA. This will be further discussed in the results and discussion sections. The bootstrap technique for replicability was employed to determine how large a sample would have been needed to reach significance. The bootstrap technique is a form of resampling that was used as an inferential application in this study (Thompson, 2006). The complete 610 cases created through multiple imputation were used as a total sample, and random cases were drawn from these cases to determine the total number of additional complete cases that would have been needed to reach significance with the CCA.

*Commonality regression analysis.* In order to answer the remaining three research questions, this study used a commonality regression analysis to determine the variance in each emergent literacy outcome (i.e., oral language, print concepts, alphabet knowledge) that can be accounted for uniquely or in combination by the domains of the HLE as measured by the *Familia Inventory* (Taylor, 2000) (i.e., *Daily Activities*, *External Resources*, *Family Reading and Writing*) and the parent-child relationship as measured by the *Parent-Child Relationship Inventory (PCRI)* (Gerard, 1994).

Commonality analysis is a variance-partitioning method that allows researchers to assess the “true” effect of independent variables on dependent variables (Rowell, 1996; Thompson, 2000). Separate regression analyses were run for each emergent literacy outcome. Commonality analysis enables the squared multiple correlation ( $R^2$ ) to be decomposed into separate components that show the variance in a variable (i.e., oral language, alphabet knowledge, print concepts) that can be accounted for by the four

separate predictor variables (i.e., *Daily Activities*, *External Resources*, *Family Reading and Writing*, parent-child relationship) and any and all combinations of the predictor variables (e.g., *Daily Activities and Family Reading and Writing*) (Thompson, 2006). The formulas used to determine the unique and common variance can be entered into a Microsoft Excel spreadsheet to be computed (Gonzalez & Uhing, 2008). Because commonality analysis takes into account the joint or common explanatory power of predictor variables, an issue most likely to occur in measuring the HLE with the *Familia Inventory* (Taylor, 2000), this statistical method was an appropriate fit for the present study.

To account for missing data, the mean imputation method was again used. This method was not used for the *PCRI* (Gerard, 1994) data as the *PCRI* had such a small sample to begin with, and missing *PCRI* scores were not considered MCAR. The commonality analysis, therefore, used 122 complete cases for the *Familia Inventory* (Taylor, 2000) and the emergent literacy outcomes, and 40 cases for the *PCRI*.

## CHAPTER IV

### RESULTS

Results for the above mentioned analyses are presented in this section. The descriptive statistics of the study, the correlations between measures, and the canonical correlation analysis (CCA), and the commonality regression analysis are each described.

#### *Descriptive Statistics*

Table 1 presents the total participants who completed each measure as well as the minimum and maximum scores, the means and standard deviations for each of the three scales of the *Familia Inventory* (Taylor, 2000), the *PCRI* (Gerard, 1994) and the three emergent literacy measures. This study included complete data on all demographic variables for 122. As shown in Table 1, the total *n* was different for most measures for varying reasons (e.g., absences, moved from school). The *Familia Inventory* (Taylor, 2000) was collected during the initial home visit by the home visitors at the beginning of the school year. Eight families (6.6%) declined to participate in the home visits and did not complete the *Familia Inventory*. The children of these families did not have emergent literacy scores that were statistically different than children whose families participated in home visits ( $p < .01$ ). After the initial home visit, between 85 and 90 families continued to participate in home visits. Despite multiple attempts and approaches (e.g., calls, home notes) of contacting the existing families, only 40 families agreed to complete the *Parent-Child Relationship Inventory (PCRI)* (Gerard, 1994). As with the overall sample, the majority of the families completing the *PCRI* were Hispanic. All of these families also completed the *Familia Inventory*. The emergent literacy

outcomes were collected during the last six weeks of the school year (i.e., April and May). All of the 122 students were assessed on name writing ability and upper case letter knowledge, and 118 (96.7%) were assessed on receptive oral language. Four students were not assessed due to absences or refusal.

Information from the manuals of the measures used provides insight on how this sample compares to the normative samples. The scores on the *Familia Inventory* (Taylor, 2000), the *PCRI* (Gerard, 1994), and the *PALS Pre-K Uppercase Letter Knowledge and Name Writing* (Invernizzi, et al., 2004) are comparable to scores obtained from the normative samples for children in this age group. The *PPVT-III* (Dunn & Dunn, 1997) scores from this sample are lower than would be expected given the data from normative samples. Experts in the field speculate that children from low-income homes may not have early literacy and language experiences that match the experiences upon which many tests are based, and these diverse experience may result in impaired performance (Champion, Hyter, McCabe, Bland-Stewart, 2003; Restrepo, Schwanenflugel, Blake, Neuharth-Pritchett, Cramer, & Ruston, 2006). Additionally, for ELL children, scores on an English language test may have impaired English vocabulary knowledge.

**Table 1**  
**Descriptive Statistics**

Measure	Minimum	Maximum	Mean	Standard Deviation
<b>Familia (<i>n</i> = 114)</b>				
Family Reading & Writing	33	111	85.25	15.70
Daily Activities	21	80	64.86	9.50
External Resources	25	76	44.62	9.99
PCRI ( <i>n</i> = 40)	162	272	187.40	22.84
PALS NW ( <i>n</i> = 122)	0	7	6.05	1.25
PPVT-III ( <i>n</i> = 118)	40	127	79.43	17.45

Note: Familia = *Familia Inventory* (Taylor, 2000). PCRI = *Parent Child Relationship Inventory* (Gerard, 1994). PALS NW = *The Phonological Awareness Literacy Screening Pre-K, Name Writing* (PALS Pre-K; Invernizzi, et al., 2004). PALS UC = *The Phonological Awareness Literacy Screening Pre-K, Upper Case Letter Knowledge* (PALS Pre-K; Invernizzi, et al., 2004).

PPVT-III = *The Peabody Picture Vocabulary Test, Third Edition* (PPVT-III; Dunn & Dunn, 1997).

### *Correlational Statistics*

Table 2 presents the Pearson product-moment correlations between the measures used in the study. The correlations were highest between the three scales of the *Familia Inventory* (Taylor, 2000). Significant correlations were found at the  $p < .01$  level between the measures of the Familia Inventory, between the PALS Pre-K Upper Case Letter Knowledge (Invernizzi, et al., 2004) and the PPVT-III (Dunn & Dunn, 1997), and between PALS Pre-K Upper Case Letter Knowledge and PALS Pre-K Name Writing.

(Invernizzi, et al., 2004). A significant correlation at the  $p < .05$  level was found between the PCRI (Gerard, 1994) and the PALS Pre-K Name Writing. These findings were expected given subsequent findings.

**Table 2**  
**Correlation Matrix**

Measure	FFR	FDA	FER	PCRI	PALS NW	PALS UC	PPVT-III
Family Reading & Writing (FFR)	1.00	.61**	.54**	.15	.11	.08	.06
Daily Activities (FDA)	.61**	1.00	.40**	.16	-.05	.00	-.03
External Resources (FER)	.54**	.40**	1.00	.07	.03	-.03	.12
PCRI	.15	.16	.07	1.00	.20*	.04	-.03
PALS NW	.11	-.05	.03	.20*	1.00	.29**	-.04
PALS UC	.08	.00	-.03	.04	.29**	1.00	.25**
PPVT-III	.06	-.03	.12	-.03	-.04	.25**	1.00

Note: Familia = *Familia Inventory* (Taylor, 2000). PCRI = *Parent Child Relationship Inventory* (Gerard, 1994). PALS NW = *The Phonological Awareness Literacy Screening Pre-K, Name Writing* (PALS Pre-K; Invernizzi, et al., 2004). PALS UC = *The Phonological Awareness Literacy Screening Pre-K, Upper Case Letter Knowledge* (PALS Pre-K; Invernizzi, et al., 2004).

PPVT-III = *The Peabody Picture Vocabulary Test, Third Edition* (PPVT-III; Dunn & Dunn, 1997).

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

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

### *Canonical Correlation Analysis*

Table 3 presents the results from the canonical correlation analysis. As described in the methods section, three techniques were used to handle the missing data. The  $p$ -

values and the Wilks' Lambda values are given in Table 2 for each method. None of the methods resulted in a statistically significant CCA result. This is most likely due to the small sample size. The results were closer to obtaining statistical significance when the more advanced method of multiple imputation was used to account for missing data, with the *p*-value decreasing from .751 with listwise deletion to between .094 and .504 with multiple imputation. The bootstrap technique employed using the data sets created from multiple imputation indicated that approximately 170 cases, or 48 additional complete cases may have provided sufficient power to find any statistically significant results if in fact there were any. Bootstrapping is an internal replicability method and is a form of resampling which allows for inferences to be made about how many cases would have been necessary to potentially find significant findings. In this analysis, random cases were drawn from the 610 complete cases created from the multiple imputation in order to estimate the number of complete cases that may have resulted in statistical significant findings.

**Table 3**  
**Canonical Correlation Analysis**

Missing Data Technique	Wilks' Lambda	<i>p</i> -value
Listwise Deletion	.938	.751
Mean Imputation	.954	.724
Multiple Imputation		
1 <sup>st</sup> set	.921	.298
2 <sup>nd</sup> set	.919	.268

**Table 3 (continued)**

3 <sup>rd</sup> set	.917	.250
4 <sup>th</sup> set	.939	.504
5 <sup>th</sup> set	.893	.094

Note: Multiple imputation resulted in 5 data sets, each with separate *p*-values and Wilks' Lambda values.

### *Commonality Regression Analysis*

Using commonality regression analyses as the data analytic strategy, Tables 4, 5, and 6 present the unique and common components of shared variance ( $R^2$ ) of the emergent literacy outcomes of receptive oral language, upper case letter knowledge, and name writing on the three scales of the *Familia Inventory* (Taylor, 2000): *Family Reading and Writing*, *Daily Activities*, and *External Resources*; and the *PCRI* (Gerard, 1994). Table 4 presents the common and unique shared variance of receptive oral language as measured by the *PPVT-III* (Dunn & Dunn, 1997). The predictor variables (i.e., the *Familia Inventory* scales and the *PCRI*), uniquely and in combination with each other, accounted for small amounts of variance in receptive oral language scores. The variable with the largest unique variance accounted for was the *Familia Inventory* scale of *External Resources*, which accounted for 1.2% of the variance. When combined with the other predictor variables, this same scale accounted for 11.1% of the variance, which is the most of any group of combinations.

Table 5 presents the commonality regression analysis for the dependent variable of preschool name writing. The predictor variables uniquely accounted for small amounts of variance. The *External Resources* scale of the *Familia Inventory* uniquely

accounted for the smallest amount of variance (i.e., .1%), while the scores of the PCRI uniquely accounted for the largest amount of variance (i.e., 3.4%). When combined together, however, the predictor variables accounted for larger amounts of variance in name writing ability. The *Familia Inventory* scale of *External Resources* accounted for the smallest amount of variance when combined with the other predictor variables (i.e., 21.5%) while the scores on the *PCRI* accounted for the largest combined amount of variance, accounting for 31.4% of the variance in name writing ability. Examination of Table 5 shows that each predictor, when in combination with other predictors, accounted for a significant amount of the variance in preschool name writing. In fact, the *PCRI* accounted for approximately 73.88% (.314/.425) of all variance in preschool scores on name writing. It should be noted that the *n* for participants completing the *PCRI* was 40 and so results including the *PCRI* only extend to these 40 cases. The predictor variable of *Family Reading and Writing*, when combined with other predictors, accounted for the next largest amount of variance in name writing (i.e., 25.8%). Overall, the data indicate that the measured variables of the home environment accounted for small amounts of the variance on receptive oral language and upper case letter knowledge in this sample of preschool children. The same variables, however, accounted for much larger amounts of the variance in preschool name writing, with the parent-child relationship, as measured by the *PCRI*, accounting for the largest amount of variance.

Table 6 presents the results of the commonality regression analysis for the dependent variable of upper case letter knowledge. As with the receptive oral language dependent variable, the predictor variables accounted for small amounts of variance in

upper case letter knowledge. The variable which uniquely accounted for the largest amount of variance was the *Family Reading and Writing* scale of the *Familia Inventory*. This variable uniquely accounted for .5% of the variance in upper case letter knowledge and also accounted for the most variance when combined with other predictor variables (i.e., 6.6%). The remaining variables accounted for small amounts of variance uniquely and in combination with other variables as can be seen in Table 6.

**Table 4**  
**Unique and Common Components of Shared Variance ( $R^2$ ) of Receptive Oral Language**

Predictor	Predictor				Total $R^2$
	FDA	FER	FFR	PCRI	
Unique FDA	0.001				0.001
Unique FER		0.012			0.012
Unique FFR			0.003		0.003
Unique PCRI				0.001	0.001
Common FDA FER	0.017	0.017			0.034
Common FDA FFR	0.008		0.008		0.016
Common FDA PCRI	0.001			0.001	0.002

**Table 4 (continued)**

Predictor	FDA	FER	FFR	PCRI	Total $R^2$
Common FER					
FFR		0.012	0.012		0.024
Common FER					
PCRI		0.013		0.013	0.068
Common FFR					
PCRI			0.004	0.004	0.026
Common FDA					
FER FFR	0.019	0.019	0.019		0.057
Common FDA					
FER PCRI	0.018	0.018		0.018	0.054
Common FDA					
FFR PCRI	0.009		0.009	0.009	0.027
Common FER					
FFR PCRI		0.013	0.013	0.013	0.039
Common FDA					
FER FFR PCRI	0.019	0.019	0.019	0.019	0.076
Total	0.092 <sup>a</sup>	0.123 <sup>a</sup>	0.087 <sup>a</sup>	0.078 <sup>a</sup>	
Unique	0.001	0.012	0.003	0.001	
Common	0.091	0.111	0.084	0.077	

Note: FDA = *Familia* Daily Activities; FER = *Familia* External Resources; FFR = *Familia* Family Reading and Writing; PCRI = Parent-Child Relationship Inventory.

a. Individual values of  $R^2$  that sum to multiple  $R^2$  (with rounding error).

**Table 5**  
**Unique and Common Components of Shared Variance ( $R^2$ ) of Name Writing**

Predictor	Predictor				Total $R^2$
	FDA	FER	FFR	PCRI	
Unique FDA	0.002				0.002
Unique FER		0.001			0.001
Unique FFR			0.010		0.010
Unique PCRI				0.034	0.034
Common FDA FER	0.004	0.004			0.008
Common FDA FFR	0.025		0.025		0.050
Common FDA PCRI	0.039			0.039	0.078
Common FER FFR		0.010	0.010		0.020
Common FER PCRI		0.035		0.035	0.070
Common FFR PCRI			0.040	0.040	0.080
Common FDA FER FFR	0.025	0.025	0.025		0.075
Common FDA FER PCRI	0.042	0.042		0.042	0.126
Common FDA FFR PCRI	0.059		0.059	0.059	0.177
Common FER FFR PCRI		0.040	0.040	0.040	0.120

**Table 5 (continued)**

Predictor	FDA	FER	FFR	PCRI	Total $R^2$
Common FDA FER FFR PCRI	0.059	0.059	0.059	0.059	0.236
Total	0.255 <sup>a</sup>	0.216 <sup>a</sup>	0.268 <sup>a</sup>	0.348 <sup>a</sup>	
Unique	0.002	0.001	0.010	0.034	
Common	0.253	0.215	0.258	0.314	

Note: FDA = *Familia* Daily Activities; FER = *Familia* External Resources; FFR = *Familia* Family Reading and Writing; PCRI = Parent-Child Relationship Inventory.

a. Individual values of  $R^2$  that sum to multiple  $R^2$  (with rounding error).

**Table 6**  
**Unique and Common Components of Shared Variance ( $R^2$ ) of Upper Case  
 Letter Knowledge**

Predictor	Predictor				Total $R^2$
	FDA	FER	FFR	PCRI	
Unique FDA	0.000				0.000
Unique FER		0.001			0.001
Unique FFR			0.005		0.005
Unique PCRI				0.001	0.001
Common FDA FER	0.001	0.001			0.002
Common FDA FFR	0.007		0.007		0.014
Common FDA PCRI	0.001			0.001	0.002
Common FER FFR		0.010	0.010		0.020
Common FER PCRI		0.002		0.002	0.004
Common FFR PCRI			0.005	0.005	0.010
Common FDA FER FFR	0.012	0.012	0.012		0.036
Common FDA FER PCRI	0.002	0.002		0.002	0.006
Common FDA FFR PCRI	0.008		0.008	0.008	0.024
Common FER FFR PCRI		0.011	0.011	0.011	0.033

**Table 6 (continued)**

Predictor	FDA	FER	FFR	PCRI	Total $R^2$
Common FDA					
FER	0.013	0.013	0.013	0.013	0.052
Total	0.044 <sup>a</sup>	0.052 <sup>a</sup>	0.071 <sup>a</sup>	0.043 <sup>a</sup>	
Unique	0.000	0.001	0.005	0.001	
Common	0.044	0.051	0.066	0.042	

Note: FDA = *Familia* Daily Activities; FER = *Familia* External Resources; FFR = *Familia* Family Reading and Writing; PCRI = Parent-Child Relationship Inventory.

a. Individual values of  $R^2$  that sum to multiple  $R^2$  (with rounding error).

## CHAPTER V

### CONCLUSIONS

The overall objective of this study was to explore the relationships between emergent literacy outcomes of preschool children and two components of their home environments, the home literacy environment (HLE) and the parent-child relationship. The study took place within the context of an Early Reading First (ERF) federal grant providing enriched, full-day, quality preschool for low-income children. Four research questions were addressed in the study, namely: (a) To what extent can emergent literacy outcomes be predicted or “explained” by dimensions of the HLE, (b) What is the shared and unique variance in English receptive vocabulary outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship? (c) What is the shared and unique variance in print concept outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship, and (d) What is the shared and unique variance in alphabet knowledge outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship?

#### *Analysis of Effects*

*First research question.* The first research question examined to what extent emergent literacy dimensions could be predicted or explained by the HLE. Canonical correlation analysis (CCA) was used to examine this relationship. The first purpose of this study aimed to provide more information about the relationship between the home literacy environment and emergent literacy, and CCA was used for the investigation. It is

known through previous literature that these two sets of variables are related with more home support and resources predicting better emergent literacy outcomes (e.g., Vernon-Feagans, et al., 2004) and through canonical correlation analysis, this study hoped to shed light on the interrelation between these two sets while minimizing Type I error.

The canonical correlation analysis did not result in any statistically significant findings. The finding was surprising given that over two decades of research has shown that parental beliefs, family literacy levels and literacy habits as well as adult-child interactions around literacy have all been linked to differences in children's language and literacy acquisition (Snow, Burns, & Griffin, 1998; Wasik, 2004). Differences in children's HLE translate into differences in opportunity for school readiness skills (Farver, Xu, Eppe, & Lonigan, 2006), especially at the lower levels of ability and income, or due to culturally diverse backgrounds. Thus, it is well documented that children experience more success in language and literacy when the practices in HLE mirror what schools value (Snow et al., 1998). The presumption is that exposure to literacy-rich home environments facilitates children's readiness to benefit from instruction across a range of socioeconomic and cultural backgrounds (Hood, Conlon, & Andrews, 2008). Some possible explanations for the lack of a statistically significant finding include sample size and measurement issues.

Canonical correlation analysis is considered a technique for large samples, and Thompson (2000) recommends a minimum of between 15 and 20 participants for each variable used in the CCA. With this recommendation, this study would have needed at least between 105 and 140 cases with most of these containing complete data. While the

total  $n$  of the study, 122, is within this minimum recommendation, the 40 cases with missing data most likely contributed greatly to the lack of statistical results. It should be noted that the 122 cases included techniques to replace missing data as described in the methods section. Even using these techniques, significance was not found, although the findings drew closer to significance as the techniques gained in sophistication. For example, listwise deletion, the most basic technique, provided results furthest from significance, while multiple imputation, the most sophisticated technique used, provided results closer to significance.

While a small sample size may be one reason for a lack of statistically significant findings, other reasons most likely contributed as well. Measurement issues also most likely played an important role in the results. Although the majority of the students in the sample were from ESL homes, the emergent literacy outcomes were assessed in English, as is required by Early Reading First. It is possible and likely that ESL students may have scored artificially low on some assessments, thus decreasing the variance in scores. This would have also affected the results of the canonical correlation analysis.

Additionally, the *Familia Inventory* (Taylor, 2000), while one of the only commercially available assessments for the HLE, has not been widely used and studied. Future research will continue to examine the psychometric properties of the assessment; however, it is important to consider that the instrument may have not measured the HLE as accurately as would be necessary to find statistically significant results in this sample.

*Second research question.* The second research question investigated the shared and unique variance in English receptive oral language accounted for by the HLE and

the parent-child relationship. Results indicated that the predictive variables (i.e., *Daily Activities, External Resources, Family Reading and Writing* and *PCRI* (Gerard, 1994)) accounted for small amounts of variance in receptive oral language uniquely and in combination together. It was expected that the predictive variables would have accounted for more of the variance given the coverage of oral language in the literature. For example, Sénéchal, et al. (1996) found that home factors, specifically the number of books in the home and library visits, was related to young children's vocabulary, and Gonzalez and Uhing (2008) found that specific variables in the home (i.e., extended family and library visits) accounted for larger amounts of variance in oral language than was found in the current study.

A measurement issue may have played a role in this finding. Receptive oral language in this study was measured in English, even for children whose primary language was Spanish, because of requirement put forth by the Early Reading First grant. This issue will further be discussed in the limitations section. It is impossible to know if measuring receptive oral language in Spanish would have resulted in a different outcome; yet, it is logical to assume that home variables would have the most impact on the primary language and that children would score higher on an assessment of their native language. Studies (e.g., Hart & Risley, 1992; 1995; 2003; National Research Council, 1998) have consistently linked socio-economic status to the vocabulary use in the home and, in turn, vocabulary has been shown to be related to later vocabulary and reading skills (Leseman & de Jong, 1998; Scarborough, 2001). Although the current

study did not add greatly to this vein of research, vocabulary development does have important roots in the home environment and to later reading ability.

*Third research question.* The third research question investigated the shared and unique variance in a print concept outcome (i.e., name writing) accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship. Results indicated that the predictor variables accounted for much larger amounts of variance in name writing than in the other emergent literacy skills. The four variables of the home environment accounted for much larger amounts of variance with the parent-child relationship measure, the *PCRI* (Gerard, 1994), accounting for the largest amount of variance among the 40 cases for which this measure was completed. *Family Reading and Writing* accounted for the most variance among all cases. The other two scales of the *Familia Inventory* (Taylor, 2000), *External Resources* and *Daily Activities*, also accounted for much larger amounts of variance than they did with the other emergent literacy skills.

The findings regarding the emergent literacy skill of name writing add the most new information to the current research base. Name writing ability has been shown to be strongly related to other emergent literacy skills (Bloodgood, 1999; Welsch, Sullivan, & Justice, 2003). Additionally, name writing is one of the key skills that predict later reading success (National Institute for Literacy, 2007). The results of the commonality regression analysis show that the parent-child relationship accounts for a large amount of variance in name writing ability among the 40 participants who completed the *PCRI* (Gerard, 1994). The relationship between parent and child has previously been shown to

be a centrally important component of the home environment (Pianta, 2004), and the current study confirms the findings of Dodici, et al. (2003) that this important relationship may be even more important for emergent literacy development, at least when it comes to the skill of name writing, than areas of the home literacy environment.

Given this finding, interest turns to hypothesizing what factors of the parent-child relationship encourage success in the skill of name writing. The relationship between a parent and a child is most often the very first social relationship a child encounters. As Pianta (1997) suggests, when a child is provided with positive early social relationships, s/he is able to develop new positive social relationships when he begins a formal school experience. Learning is much more likely to take place in a positive social situation than in a negative situation. Because real life observations were not conducted, it is impossible to know what these relationships between the children and parents in this study actually look and feel like, and in what manner these relationships encourage name writing. It certainly could be likely, however, that parents who reported a positive relationship with their children were also more likely to work with their children on name writing. It also may be that these same children were more able to learn in a school setting because of the foundation of positive relationships they had already developed with their parents. Either one of these explanations is consistent with research that demonstrates that children who have positive and warm relationships with their caregivers excel faster in their literacy development (e.g., Merlo, et al., 2007). In conclusion, although the sample of families completing the *PCRI* (Gerard, 1994) was small ( $n = 40$ ), the amount of variance accounted for in name writing was large (73.88%)

of all variance). It must be emphasized, however, that the small sample size prevents applying this finding to other samples and populations and is a threat to the external validity of this and other findings. This finding is noteworthy in that it should encourage more research to determine if this finding is significant to this line of research.

The variables associated with the home literacy environment also accounted for large amounts of variance in name writing, and these findings extend to the entire sample. *Family Reading and Writing*, *Daily Activities*, and *External Resources* each accounted for substantial amounts of variance in name writing, with *Family Reading and Writing* accounting for the most, with 26.8%, when in combination with the other variables. These results contributed to research implicating shared book reading as being associated with a child's early written register (Bus, van IJzendoorn, & Pellegrini, 1995). This study confirms the importance of reading and writing together to learning to write what is traditionally a child's first written word, her name.

*Daily Activities* accounted for the next greatest amount of variance (i.e., 25.5%) in name writing ability when combined with the other variables. This scale includes such activities as television and media use, rhyming and singing. The literature generally shows television use to be negatively associated with literacy outcomes (e.g., Bus & van IJzendoorn, 1988; Clarke and Kurtz-Costes, 1997) while rhyming and singing have been positively associated with these outcomes (Bennett, et al., 2002; Weigel, et al., 2006). The results of this study found that the combination of these activities accounted for greater than one-fourth of the variance in name writing ability when combined with other home variables. This finding can be interpreted to mean that access to media

resources and parental engagement in activities such as rhyming may have positively impacted a child's ability to write his name.

The frequency of library visits has been shown repeatedly in the literature to be related to emergent literacy outcomes (Gonzalez & Uhing, 2008; Payne et al., 1994; Sénéchal, et al., 1996). Library visits are a factor in the *External Resources* scale which accounted for 21.1% of the variance in name writing when combined with other home variables. While this is the least amount of variance, it is still a significant amount. Library visits may encourage exploration of the printed word and may expose children to books and more literature activities. Other external resources, such as extended family, also may serve to improve children's access to literacy resources and activities. Taken together, these factors related, in this study, to name writing ability. This study is among one of the only to find a relationship between these activities and the specific skill of name writing.

*Fourth research question.* The fourth research question investigated the shared and unique variance in upper case alphabet knowledge outcomes accounted for by the HLE (*Daily Activities, External Resources, Family Reading and Writing*) and the parent-child relationship. The results of the current study indicated that variables of the home environment accounted for small amounts of variance, both uniquely and in combination together, in upper case letter knowledge. These results were somewhat surprising given the other relevant research indicating that the home environment can foster important growth in emergent literacy, and specifically in knowledge of the alphabet and the alphabetic principle (e.g., Purcell-Gates, 1996; Sénéchal, et al., 1998).

The home environment variables did not account for much variance in upper case letter knowledge and it is possible that this finding could have been related to the quality of instruction the preschool students were receiving. The mean for upper case letter knowledge at the end of the preschool year was 22.4 ( $SD = 4.71$ ). The maximum score on this assessment was 26, indicating correct identification of all upper case letters. Clearly, this mean indicates that most children knew the vast majority of their upper case letters by the end of the school year, resulting in less variance. Pre-test scores from early in the school year were not included in this study, but as letter knowledge was an emphasis of the curriculum throughout the school year, through such intensive curricula as *Let's Begin with the Letter People* (Abrams & Company, 2000), these results are what would be expected and hoped for by teachers and administrators. Because of the strong relationship between alphabet knowledge and later reading achievement (e.g., National Institute for Literacy, 2007; Scarborough, 2001), the upper case letter knowledge outcomes among the preschool students should be viewed as a success for the program.

#### *Limitations*

*Design and internal validity.* The small sample size for the *PCRI* (Gerard, 1994) and the missing data are problematic issues for the internal validity of this study. Although measures were taken to account for missing data in the most responsible manner possible, as with all missing data, it cannot be conclusively known what values would be included in analysis had the data not been missing. Clearly, results could have been different if more cases contained complete data. Additionally, the *Familia Inventory* (Taylor, 2000) and the *PCRI* relied on self-report measures. As with all self-

report measures, this introduces a level of bias into the data. Because observations were not completed on the home environment, it was not possible to obtain less-biased data, and this compromises the internal validity of the study. It is altogether possible that the families who chose to participate were qualitatively different than those who chose not to participate and this limitation is also a threat to internal validity. However, it is important to note that this is a limitation of all survey research.

Additionally, weaknesses of the *Familia Inventory* are discussed in the methods section. These weaknesses include a small normative sample as well as little information regarding reliability and validity. Any results involving the *Familia Inventory* should be tempered by these weaknesses.

*External validity and generalizability.* Participants in this study were all considered low-income and the majority spoke Spanish as their first language. While the results from this study should be considered when working with similar families, findings cannot be extended to families who do not match this demographic. Additionally, because of the small sample size of families completing the *PCRI*, results regarding the parent-child relationship also cannot be generalized to other families. All results are unique to this study and the measures and techniques will need to be replicated in larger and more representative sample before generalizing of results could occur.

*Analyses and statistical power.* As previously mentioned, while the sample size did fall within the minimum recommended to complete a canonical correlation analysis (CCA) (Thompson, 2000), the missing data most likely impeded the findings. The

bootstrap replicability analysis indicated that a sample of approximately 170 participants would have yielded adequate power. As such, with regards to the CCA, the current study most likely lacked the statistical power necessary to truly understand the relationship between the two variable sets.

This study also was a “snap-shot” view of the emergent literacy skills and the home environments of the children of in this specific study. Pre-test scores were not accounted for on any of the measures and thus were not controlled for. This is a limitation to the study in that individual differences in emergent literacy skills at preschool entry were not considered in the study because of the statistical methods employed. The children in the sample were unique in that there were a high percentage of ELL students as well as students from low-income homes. The uniqueness of the sample must be considered when generalizing beyond this study.

*Measurement.* As with any self-report method, the *Familia Inventory* (Taylor, 2000) and the *Parent-Child Relationship Inventory* (Gerard, 1994), most likely introduced reporting bias to the study. It has been shown, however, that maternal reports of family literacy have been shown to account for variance in emergent literacy outcomes, indicating reliability of reports (Dickinson & DeTemple, 1998). Additionally, the use of an English receptive vocabulary assessment for children who spoke Spanish as their first language most likely resulted in artificially low scores. The use of this assessment was a requirement from the Early Reading First grant, and time and financial issues prevented the collection of a Spanish version of the assessment. Results involving receptive vocabulary should thus be interpreted with caution.

### *Future Research Directions*

The results of this study have some implications, albeit tentative, for future research. First and foremost, a larger, more representative sample with less missing data should be used for a canonical correlation analysis (CCA). Research shows a connection between the HLE and emergent literacy skills (Landry & Smith, 2006; Whitehurst & Lonigan, 2001), but the use of CCA has the unique quality of minimizing Type I error while providing an overall picture of the relationship between these two groups of variables. This information would be valuable for practical purposes, such as to inform home literacy programs and emergent literacy interventions, and also to inform public policy. Additionally, some studies have investigated the impact of the HLE on reading skills longitudinally (e.g., Burgess, et al., 2002), and it would be valuable to follow the sample of students in this study longitudinally as well. Because this sample of students and families included children considered at-risk for later reading problems, continuing to investigate their home literacy environment and its relationship to developing reading skills would provide further insight into how these variables relate over time.

Furthermore, CCA should be applied to data from children and families of other ethnic and socioeconomic backgrounds in order to learn how emergent literacy skills and the HLE relate among different samples. Great caution should be used in generalizing findings from this study to other populations, and it would be important to know the relationship between the two groups of variables among other groups in order to individualize interventions. The uniqueness of the sample precludes broad generalizations to other groups of students.

The most noteworthy finding of the current study relates to the large amounts of variance accounted for in name writing ability by the home environment. Name writing ability is shown to be related to other emergent literacy skills and later reading ability (Badian, 1982; National Institute for Literacy, 2007, Treiman & Broderick, 1998) and writing interventions with preschool children and families have shown promising results (Aram & Biron, 2004; Aram & Levin, 2002). The results from this study indicated that the home environment may influence name writing ability and the commonality regression analysis should be replicated with a larger study to confirm these findings. Additionally, the manner in which the home environment influences name writing should be investigated further in order to inform interventions. For example, real-life observations and structured interviews with families could add information about what types of activities and encouragement families are giving to young children which result in stronger ability in name writing. Specifically, the *PCRI* (Gerard, 1994) provided a single score to characterize the parent-child relationship, and among the 40 families who completed this assessment, it accounted for the largest amount of variance in name writing. This sample is not large enough to inform results that can be generalized. The small sample additionally is a threat to validity and caution must be used in interpretation. More information is needed about the parent-child relationship and how it influences this emergent literacy skill, and this would best be accomplished by real-life observations in the home. Name writing may appear to be a simple skill; yet, it may introduce children to letters, to writing, and may help children to take a personal interest in literacy in general. Thus, further investigation of this skill with regards to the

development of the skill, interventions targeting the skill, and family and teacher encouragement could be vastly important to emergent literacy research.

### *Tentative Implications*

The small and unique sample and missing data preclude definitive implications from being made, however, the results of this study hint at some directions for future research on emergent literacy intervention, particularly intervention involving families. Although tentative, these implications also provide some insight for to school personnel involved in designing and implementing early childhood interventions. The findings surrounding name writing ability are notable and will be discussed.

The parent-child relationship and the HLE variables accounted for a significant amount of variance in name writing ability. These findings suggest that the home environment may play an important role in developing this emergent literacy skill. While clearly speculative, and more research is needed, this finding suggests more attention be focused on print concept dimensions of interventions targeted at families. Parents as Teachers (PAT) Born to Learn™ model (Parents as Teachers, 2008), for example, emphasizes the parent-child relationship and aims to teach parents the skills to provide an enriching educational environment at home. Although unique to this, study the finding the print concepts was related to the parent-child relationship suggests that this skill may be especially amenable to intervention. This study adds to a growing literature base which indicates the relevance of the home environment to early childhood interventions seeking to incorporate families in the educational process. The next tentative implication revolves around the encouragement of the skill of name writing,

and writing interventions in general. The current study did not link name writing ability to later reading ability; however, this link has been found in other important research (e.g., National Institute for Literacy, 2007). Among the emergent literacy skills assessed in this study, name writing was found to be the skill for which the home environment accounted for the most variance. Writing interventions used with preschool children and their families have shown some success in improving skills related to print concepts and alphabet knowledge (i.e., Aram & Biron, 2004; Aram & Levin, 2002) and family literacy practitioners and teachers should utilize these findings when working with children and families. Given that the parent-child relationship was most related to name writing, teaching parents to work with their children on name writing may provide both instruction in literacy and quality time between parent and child. As name writing may help children to learn the alphabetic principle (e.g., Welsch, Sullivan, & Justice, 2003) through exposure to letters familiar to the child, this is an area that should be incorporated into early childhood interventions.

This study primarily looked at the home environment, thereby implications for the classroom were precluded. However, it should be noted that several teachers in the current study indicated in a structured interview to S. Tani-Prado, a member of the ERF project staff, that the resources provided to the parents and the encouragement of parental participation in the classroom were major strengths of the ERF grant (personal correspondence, April 29, 2009). One teacher indicated that the children came to school better prepared to learn the curriculum because of increased communication between the parents and teacher and because the parents were learning how to teach their children at

home through the home literacy intervention. This type of anecdotal information emphasizes the purpose behind home literacy interventions.

### *Conclusions*

The purpose of this study was to examine the extent to which emergent literacy outcomes can be predicted or explained by the home environment. Additionally, the second purpose was to investigate the emergent literacy outcomes separately and determine the variance within each skill accounted for by four different variables of the home environment. The first purpose was addressed using canonical correlation analysis (CCA) and did not result in a statistically significant finding. Further analysis indicated that a larger, more complete sample was needed. Results investigating the second purpose, using commonality regression analysis, indicated that variables studied in the home environment accounted for large amounts of variance in the skill of name writing. Specifically, the most amount of variance was accounted for by the parent-child relationship. Conclusions drawn from these results, however, must be interpreted with caution as the sample size was small, particularly for the parent-child relationship measure, and techniques were required to account for missing data.

Given this caveat, the results do provide some support for existing research while also elucidating areas of future research and practical implications. This study used the emergent literacy model of Storch and Whitehurst (2001) to divide and investigate emergent literacy skills. The oral language skills of receptive vocabulary and the code-related skill of upper case letter knowledge were not found to have significant variance accounted for by the home environment variables. The code-related skill of name

writing, however, was found to have large amounts of variance accounted for by these variables. Given the importance of name writing as a precursor to later reading (National Institute for Literacy, 2007), this finding is substantial.

Research continues to show the importance of the home environment to early and later reading, and with a larger and more complete sample, the current research study would most likely have shown a similar relationship. The finding that variance in name writing ability can be greatly accounted for by variables in the home environment is noteworthy and future interventions and studies should continue to examine this skill and its impact of later reading ability. In conclusion, early childhood can be a time of great beginnings if important resources and supports are provided. The home environment clearly must provide much of this support and practitioners and researchers in early childhood education must consider and enact interventions to bolster families in the effort to provide an optimal environment.

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