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**EVALUATING THE ROLE OF PARENTAL INVOLVEMENT IN PUBLIC  
PRESCHOOL IN PREDICTING THE DEVELOPMENT OF EMERGENT LITERACY  
SKILLS**

A Dissertation in  
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by  
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## ABSTRACT

Preschool parental involvement is critical to fighting the war on poverty and strengthening children's school readiness skills. Existing empirical studies demonstrate that broad indicators of parent involvement are positively associated with children's academic success. However, longitudinal studies that clarify the role of preschool participation in promoting parent involvement and that link specific components of parental involvement to specific dimensions of emergent literacy skills are needed. This dissertation has two primary goals: (1) to clarify how parent involvement changes as a result of one year compared to two years of a universal preschool program; and (2) to clarify how specific domains of parent involvement predict to children's emergent literacy skills in Kindergarten. Preschool children (ages 3-4 years) and their parents were recruited from a very disadvantaged Northeastern urban community. The total analytic sample included 290 children (n=145 entered at age 3; n=145 entered at age 4). Three hypotheses were partially supported. The first hypothesis was that a longer duration of preschool programming (2 years versus 1 year) would result in increased parent involvement. By using matched propensity score analyses, findings suggest that two years of preschool programming, compared to one year, improved parent-child talking activities and parent emergent literacy practices at home. Also, two years of preschool programming was marginally related to parents "showing up" at school (e.g., volunteering in class, field trips, and attending school wide events). The second hypothesis was that the quality of teacher-parent interactions would help explain the increased parent involvement. Teacher's ratings of the quality of the relationship with the parent were positively related to parents making more visits to the library. The third hypothesis was that greater parent involvement would improve children's school readiness skills, specifically emergent literacy skills. Parent talking activities predicted Kindergarten receptive vocabulary skills, and a composite of parents "showing up" at school activities was a significant predictor of receptive vocabulary. Lastly, visits to the library significantly predicted children's Kindergarten letter word identification skills. Implications for parent involvement and future directions for preschool programs are discussed.

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## CHAPTER 1- INTRODUCTION

Children from low-income or economically disadvantaged families are at risk for lower educational achievement compared to their more affluent peers (Brooks-Gunn, 1995; McNamara, Scissons, & Gutknecht, 2011). Preschool programs are one of many initiatives implemented to close this achievement gap, with a large proportion of these programs including an emphasis on low-income parents' involvement in supporting their children's learning (Reynolds, 1995; Zigler, & Styfco, 2004). One of the primary reasons parents are targeted in these programs is that variations among low-income preschool children in exposure to parental language are strongly related to later vocabulary development (Hart & Risley, 1995). Research suggests that many parent-child interactions are malleable, and that preschool programs can offer some explicit training, or exposure to models of positive adult-child interactions. These specific interactions are expected to improve children's language and other school-readiness skills (Bronfenbrenner, 1975; Fan, & Chen, 2001; Reynolds, 1995). Thus, the federal government has invested in programs (e.g., Head Start, Title I programs) targeting both direct child classroom instruction and parent involvement through a variety of school initiated activities. State and local government initiatives (e.g., Harrisburg Preschool Program) help to complement these efforts. There is general theory and empirical research on how parents support their children's education, but more research is needed for the specific domain of emergent literacy skills.

This dissertation focuses on how preschool programs improve parent involvement, and in turn how this involvement affects children's school readiness skills and academic success. First, it will examine if the duration of preschool programming is associated with increased parent involvement. Secondly, it will investigate if any particular mechanism (i.e., quality of teacher interactions with parent) might help explain the likelihood of increased parent involvement. Finally, it will investigate if parent involvement influences children's school readiness skills, specifically emergent literacy. The review of the literature begins with a brief definition of school readiness followed by a review of why parent involvement is such a crucial component to improving school readiness, with attention to possible

mechanisms, such as poverty and maternal education. Finally, the literature on promoting parent involvement to increase children's school success will be reviewed including research on programs based primarily on theoretical models (e.g., Epstein) and programs based on evidence based models (e.g., Head Start, Chicago Parent Child Centers).

## **School Readiness & Early Academic Success**

Children's academic success begins with what is defined as "school readiness". According to Blair (2002), a school-ready child is one who shows an ability to learn to read, to behave according to expectations and to engage in the lesson plans. While this definition of school readiness includes both cognitive and behavioral domains, this dissertation will focus on the cognitive indicators known to predict a child's ability to learn to read. The National Reading Panel report (NRP, 2000), a government-funded meta-analysis, identified three categories of skills that promote the development of reading: alphabets, fluency and comprehension. Alphabets concerns rules of grapheme-phoneme correspondence, fluency concerns reading speed, and comprehension is the cognitive process concerned with understanding what is read, including vocabulary. While the NRP meta-analysis was conducted with children between kindergarten and eighth grade, many of the skills needed to learn to read begin to develop before children enter kindergarten. The area of research called emergent literacy focuses on the set of skills related to later literacy that emerges from infancy up to kindergarten. Although there are several slightly varying definitions of emergent literacy, all include the two broad skills that correspond to the NRP domains of alphabets and comprehension. For example, Scarborough (2002) classified the development of skilled reading into two components: word recognition and language comprehension skills. Similarly, Whitehurst & Lonigan (1998) describe two broad domains of emergent literacy: decoding skills that involve translating print into sounds and sounds into print and comprehension skills that involve extracting meaning from print.

**Emergent literacy—decoding skills.** Decoding skills allow the reader to separate words into their parts. One area of decoding skills is phonological awareness. Phonological awareness refers to a child's ability to separate the stream of spoken language into component sounds. Phonological awareness develops gradually during the preschool years

(Whitehurst & Lonigan, 2002). First children learn to separate sentences into words, then words into syllables, then syllables into individual phonemes (the smallest unit of sound) (NRP, 2000). Phonological awareness is one of the best predictors of early reading acquisition (NRP, 2000): it is more predictive than IQ, vocabulary, and listening comprehension (Scarborough, 2002). Phonological awareness is a foundational ability underlying the learning of spelling-sound correspondences (NRP, 2000) and can be measured in a variety of ways including blending, segmenting and deleting the syllables or phonemes in spoken language (NRP, 2000; Whitehurst & Lonigan, 1998).

**Emergent literacy—language comprehension skills.** Comprehension skills include the child's vocabulary (semantics), ability to understand language (syntax) and general background knowledge. An ability to understand and use vocabulary is a crucial component of comprehension skills: receptive vocabulary refers to a child's ability to understand the words they hear while expressive vocabulary refers to a child's ability to find a word that is meaningful in a given context and say it. The ability to interpret the meaning of words is even more important in written communication than it is in oral communication. Oral communication makes use of important pragmatic features such as body movements and facial expressions that often occur during social interactions. In contrast, during written communication the person must actively read and then interpret the meaning of the text without such cues. The reader must interpret word meaning and expression by using other cues embedded within the text or their own background knowledge. Scarborough (2002) emphasizes the importance of vocabulary and background knowledge as a child moves into more skilled reading. She emphasizes that not knowing the meaning of more complex words limits reading comprehension. Likewise, children with little background knowledge to interpret the meaning of the text will face greater difficulty in understanding what they are reading. That is, they may be able to read the words but not comprehend the meaning of the text.

**Emergent literacy and later academic success.** Many of the components that make-up the domains of emergent literacy begin to develop even before children enter school. For example, Whitehurst and Lonigan (1998) found that emergent literacy skills in

Kindergarten combined to predict up to 58% of the variance in reading skills in 2<sup>nd</sup> grade. Juel (1988) reports 88% of children who are poor readers in 1<sup>st</sup> grade remain poor readers at the end of fourth grade. Poor reading continues to be a problem as children progress through school, and so often fail to progress through school. Children who fail to develop literacy skills are 3 to 4 times more likely to drop-out of high school (U.S. Department of Education, 1999). Failing to learn to read continues to have a negative impact on youth. For example, more than three quarters of juvenile offenders have reading problems and more than half of all American prisoners are illiterate (US Department of Education, 2013). Given the developmental importance of literacy and the key building blocks that begin in infancy through the preschool years, there is an interest in understanding the contributions that parents make to the development of those skills.

**Poverty, maternal education and academic success: Implications for preschool programs.** Early socio-economic differences relate to language delays prior to kindergarten, and these delays predict later academic achievement (Walker, Greenwood, Hart, & Carta, 1994). Research suggests that disadvantaged students in 1<sup>st</sup> grade have half of the vocabulary of their advantaged student peers (Graves, 1986; White, Graves & Slater, 1990). The difference in achievement between children in poverty and their non-poor peers continues to widen as children progress through school (Brooks-Gunn, 1995; McNamara, Scissons, & Gutknecht, 2011). As academic failure continues through school, the greatest risk to children in low-income families is high school drop-out (Chapman, Laird, & KewalRamani, 2010). Children from low-income families have a 16.7% rate of dropout, compared with only 3.2% of children from high-income families. The cascading effects of the achievement gap broaden over time, as low academic achievement and high-school dropout also predict later crime, lower labor market success, and poorer health outcomes (Hartnagel & Harvey, 1989; Krohn, Thornberry, Collis-Hall, & Lizotte, 1995; Thornberry, Moore, & Christenson, 1985; Zajacova, 2012). These cascading effects carry major costs. For instance, one cohort of high-school dropouts costs the nation over \$325 billion in lost tax revenue from lost earnings (Rouse, 2005).

Due, in part, to high school dropout, there is often an intergenerational transmission of academic failure. Therefore, maternal education is often considered one of the best predictors of children's academic achievement (Duncan & Brooks-Gunn, 2000; Ramey, Bryant, Sparling, & Wasik, 1985; Schweinhart, et al., 1985). Maternal educational attainment may have three possible causal mechanisms that predict children's academic achievement. First, there may be a genetic transmission of reading disabilities and learning problems (Scarborough, 2002). For example, there may be a common biological explanation that makes learning difficult for both the mother and her child. Second, mothers with a higher maternal education may be more likely to value and provide the types of daily activities that promote children's literacy skills (Brooks-Gunn & Duncan, 1997). The inverse is also true: mothers with lower maternal education may not have had positive experiences in school and do not value educationally enriching activities (Comer, Haynes, Joyner, & Ben-Avie, 1996). Third, higher maternal education provides opportunities to learn what experiences are most important for children to succeed in school. The last two mechanisms suggest that mothers with lower education have less social capital and may benefit most from programs that offer opportunities to learn what parenting behaviors are enjoyable and critical for their children's academic success.

Weiss and colleagues (2005) propose a social capital argument that families with lower maternal education are less likely to have academic expertise and experiences within the school climate. It is these types of experiences that will help children succeed in school, and why family educational involvement is so important. In other words, it is not necessarily that parents do not want to help their child with their schooling, rather it is that they do not know how to help (Epstein & Dauber, 1991). For this reason, Weiss and colleagues (2005) propose that parental involvement at school is more likely to be beneficial to children of mothers with the lowest education, who have the least amount of this type of experience and whose participation at school can help increase their knowledge and activities with their child. Thus, there may be a moderating relationship of maternal education, in which school involvement might be most advantageous to those with the lowest level of education.

One important issue is whether to offer pre-kindergarten program to 3-year old children, who would benefit from two years of the program, or to offer the program only to

4-year old children. Reynolds (1995) found that two years of preschool had significantly larger effect size than participation for one year. However, he suggested that offering the program only to 4-year old children yields a stronger benefit than no program at all, and that if resources are low, the priority should be given to older children. More recently researchers have utilized propensity score matching methods to support stronger causal inferences regarding the impact of duration of preschool participation for children (Domitrovich et. al., 2013; Wen et. al., 2012). Wen and colleagues, utilized a national sample of Head Start children to evaluate the benefit of an additional year of preschool. They found that children who attended 2 years of preschool had higher scores on measures of receptive vocabulary, letter word identification, in addition to other teacher ratings of social competence compared to children who attended 1 year. Domitrovich and colleagues (2013) also support the programming benefit for children who enroll at 3 years old compared to a group of children propensity score matched on demographic variables who enrolled at 4 years old. Effect sizes ranges from .39 for letter-word identification skills to .53 for receptive vocabulary. There were no differences for early writing skills.

Although much of this research focused on children in their evaluation, Chaffel (1992) suggests two years of preschool attendance is necessary for both children and their parents. Parents who are at the greatest risk may need the first year of the preschool program just to get acquainted with the system and the second year to feel more comfortable to be involved. This idea of educating the parent not just the child is at the center of many comprehensive preschool programs.

### **Parent-Child Interactions Supporting Early Learning**

There is extensive research that suggests variations in parent-child interactions impact the development of children's cognitive and language skills. For example, Hart & Risley (1995) demonstrated the ways in which children's language development differs as a function of the amount of words spoken in the home. Children from families on welfare heard half the amount of words than children from families with higher education (e.g., professional families). Their research suggests the quality and the quantity of caregiver's language directed toward the child are related to children's vocabulary. There is also strong

evidence that even after controlling for background demographic information, mothers who elaborate on children's utterances and behavior have children with larger vocabularies (Wallace, Roberts, & Lodder, 1998). Thus, researchers emphasize the meaningful differences in cognitive stimulation that children from different social backgrounds receive from their parents. These parent-child interactions are not explicitly in the context of school but describe parents' broader influence on children's language skills.

Parents provide other cognitively stimulating activities and resources that promote children's learning. For example, Bradley and colleagues (2001) have used the HOME (Home Observation of the Measurement of the Environment) to demonstrate that many home activities (e.g., provision of role-play toys, reading books) are related to children's receptive vocabulary skills. Most such activities showed significant differences by poverty level (Bornstein & Bradley, 2003; Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001).

Given the extraordinary societal cost of the cascading effects of the intergenerational transmission of low achievement, the federal government has invested considerable resources to increase low-income children's academic achievement. One strategy has been to encourage positive parent-child interactions through parent involvement initiatives in the school setting. Federally-funded programs such as Head Start and Title I have attempted to engage parents from low socioeconomic backgrounds to increase positive parenting behaviors in order to promote children's academic success. While some parent involvement initiatives begin in preschool, there is a large body of empirical research investigating parent involvement at school.

**Research on parent involvement.** Fishel & Ramirez (2005) summarized the definition of parent involvement from Wolfendale (1983) as the "participation of a significant caregiver (e.g., parents, grandparents, stepparents, foster parents, etc.) in the educational process with their children in order to promote their academic and social well-being" (p. 371). Although the term parent is used to describe the active party, it is well understood that any person who cares for and has custody over the child will fall under this term (Wolfendale, 1983). There is an abundant literature on parent involvement but the empirical evidence is weak. There



are very few parent involvement intervention studies that can withstand the empirical rigors of an evidence-based practice framework. Similarly there are numerous recommendations on ways schools can promote parent involvement, but the empirical research foundation for these suggestions is mixed. Several meta-analysis had inconsistent results on the benefit of parent involvement (Fan & Chen, 2001; Fishel & Ramirez, 2005; Mattingly, Prislin, McKenzie, Rodriguez, & Kayzar, 2002). The major limitation in the literature on parent involvement is the lack of a shared operational definition. Most research takes one of two approaches. The most common approach is to define parent involvement based on where the interactions occurs, often referred to as domain location specific. A large number of recent studies define parent involvement within three domains of home, school, and parent-teacher communication (i.e., the relationship between the home and school; Dearing, et. al., 2004; Epstein, 1995; Fantuzzo, Tighe, & Childs, 2000; Fantuzzo, McWayne, Perry, & Childs, 2004; Fantuzzo, et. al., 2013; Gavin & Greenfield, 1998; Izzo, Weissberg, Kaspro, & Fendrich, 1999; Kohl, Lengua, & McMahon, 2000; Mendez, 2010; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Webster-Stratton, 2000). However, other studies focus only on one or two of those domains at a time. For example, some studies include only the school domain (Dearing, Kreider, Simpkins, & Weiss, 2006; Schulting, Malone, & Dodge, 2005), only the home domain (U.S. Department of Health and Human Services, 2005; Lamb-Parker, 1999; Marcon, 1999), or only parent-teacher communication (Herman & Yeh, 1983; Mantzicopoulos, 2003). Because studies are not consistent in their definition of parent involvement and include a variety of the domains, generalizing findings is difficult.

The second approach to parent involvement research is to focus on specific parenting practices, such as helping with homework, attending school programs and extracurricular activities, or monitoring how well a student is doing (Eccles & Harold, 1993; Steinberg, Lamborn, Dornbusch, & Darling, 1992; Stone, 2006). Studies that use an assortment of specific practices can produce reliable measures but there is some concern that they do not capture important distinctions. For example, Grolnick & Slowiaczek (1994) suggests three types of parent involvement practices: intellectual/cognitive (e.g., intellectually stimulating support, reading books, going to museums, concerts), behavior (e.g., “showing up” at events like music, back to school night) and personal (e.g., caring about child’s academic success). Grolnick & Slowiaczek’s typology, especially the unique focus on behavioral “showing up”,

provides a wider net of parent involvement practices. Grolnick & Slowiaczek's typology does not explain the process of how each type of parent involvement predict changes in child outcomes but other work in this tradition suggests some possibilities. For example, Reynolds suggests "showing up" at school allows the parent to view positive models for adult-child interactions, while the Grolnick & Slowiaczek typology suggests "showing up" demonstrates an attitude of caring to the child. This domain will be examined in the current study. Unfortunately the measurement and grouping of specific practices varies across studies, simply depending on the author's preference. These varying definitions make comparisons between studies challenging. Additionally, Grolnick & Slowiaczek's typology does not include parent-teacher interactions and lacks other preschool intervention components that specifically target parent learning (i.e., home visits, parent meetings). Thus, there is a growing body of research supporting the domain specific parent involvement.

In a special issue of *School Psychology Quarterly*, Christenson and colleagues (2005) reported results from a meta-analysis of interventions focused on parent involvement, education and collaborations in a school setting. The most effective interventions included specific parenting behaviors (e.g., techniques to engage a parent in reading with his or her child) or programs that included parent training or cognitive behavioral family therapy in schools. These interventions are based on cognitive-behavioral theory for changing negative behavior problems, yet few included school achievement outcome measures (Valdez, 2005). Bates (2005) reports that only three of the 15 family based preschool programs provided strong evidence for educational or clinical significance, although many studies were small and laced statistical power (e.g., one study had a sample size of  $n=9$ ). Other studies were multiple component interventions making it impossible to isolate the benefit of the parent involvement component. Programs that were less successful did not have clear behavioral objectives for the program (Hoard & Shepard, 2005).

There are several methodological weaknesses common to the study of parent involvement (e.g., lack of random assignment, insufficient follow-up). Despite these limitations parent involvement interventions remain popular. Fan & Chen (2001) suggest one of the major strengths of parent involvement interventions in school is that they are intuitively appealing to key stakeholders (e.g., teachers, principals, parents). This appeal of

increased parent involvement makes the investment in empirical evidence all that more important. The following sections reviews Joyce Epstein's influential model of parent involvement and three specific models of preschool parent involvement.

***Epstein's types of parent involvement.*** Joyce Epstein is one of the most prominent researchers studying parent involvement. Her book, *School, Family and Community Partnerships: Preparing Educators and Improving Schools*, which describes her theory and research on parent involvement, has been cited more than 900 times. Epstein suggests there are five different types of parent involvement (Epstein & Dauber, 1991) including (1) basic responsibilities of families (i.e., providing care and learning materials), (2) basic responsibilities of schools (i.e., providing basic communication to parents), (3) parent involvement at school (i.e., volunteering), (4) parent involvement at home (i.e., specifically guided by teachers to support classroom learning), and (5) policy-making school boards. More recently Epstein has discussed a sixth type of parent involvement (Epstein & Sheldon, 2002; Sheldon & Epstein, 2004; Sheldon & Epstein, 2005), collaboration with community organizations.

Epstein's work has contributed substantially to the work of schools initiating parent involvement interventions. Her research provided a conceptual framework that shifted the responsibility of parent involvement from the parent to a shared responsibility between parents and schools. Epstein offered suggestions on ways schools can promote parent involvement and welcome parents. The goal of these varying types of parent involvement is to increase children's academic success. Although Epstein's research emphasizes the importance of these types of parent involvement, her foremost conclusion is how schools and teachers can encourage and increase parent involvement, especially among parents who would normally not initiate contact with schools (Epstein, 1982). Epstein recommends two main strategies schools that teachers can implement to increase parent involvement.

First, Epstein emphasizes that teachers make the biggest difference in whether or not parents will be involved in their children's education. When Epstein (1990) compared teachers who were recognized by their principals as leaders for their parent involvement activities and those who were not, she found significant differences exist in the amount and variety of teacher-initiated activities. For example, teachers identified as leaders were

particularly likely to use practices such as asking parents to: read aloud to children or listen to children read, sign a child's homework, and give spelling or math drills. Epstein argues that these teacher-initiated programs and practices are more important than parental demographic information (e.g., education level, marital status, or employment status). Furthermore, teachers who have strong parent involvement practices make requests to all parents regardless of education and marital status, whereas other teachers make more requests to single and low-educated parents (Epstein, 1990). Epstein (1991) showed teacher practices that involve making requests to all parents resulted in greater gains in fall-to-spring children's reading skills. Additionally, teachers who offered more parent involvement practices did not give significantly inferior ratings to single parents or less-educated parents on their helpfulness or follow-through on home-learning activities despite these parents' lower involvement at school. Epstein suggests that these teachers understand that just because a parent is unable to participate at school, the parent may still be engaged in other important educationally enriching activities with the child at home (Epstein, 1990).

Second, Dauber & Epstein (1993) suggest that when schools make an effort to engage parents in learning activities at home, parent volunteering at school and participation on policy boards are also high. However, the reverse is not true: just because a school offers opportunities for parents to volunteer at school or participate in decision making committees does not mean the school will offer activities for parents and children to do at home. Thus, a combination of school-initiated and teacher-initiated practices are needed to increase parent involvement. As Dauber & Epstein (1993) state, "The strongest and most consistent predictor of parent involvement at school and at home are the specific school programs and teacher practices that encourage and guide parent involvement" p .207. She identifies Title I program as a possible mechanism to improve both school-level and teacher-level parent involvement practices (Epstein & Dauber, 1991; Epstein, 1982).

Epstein has made critical contribution to research on parent involvement but her research has generated two major critiques focused on (1) methodological weaknesses in her empirical studies and (2) a tendency to reach interpretations that are not supported with the data collected. With regard to methodological weaknesses, for example, the evidence to support the 5 unique types of parent involvement is weak. Epstein & Dauber (1991) report

moderate ( $r=.3$  to  $r=.5$ ) correlations between the five factors in a single study as evidence of valid and unique constructs, but do not provide stronger forms of evidence for construct validity (e.g., MTMM, SEM; Campbell & Fiske, 1959). She does not include a standard methods section in many of her articles and does not cite the psychometric properties of the measures she uses. Descriptions of samples are also limited so that it is unclear if she uses the same sample to validate her theory in nine of her articles. Many of her analyses should have accounted for the nesting of classrooms within schools, especially since specific teachers were identified as leaders in parent involvement: parents in those classrooms might be more similar than parents in another classroom. Epstein also includes multiple grades in the same analysis without considering issues of measurement factorial invariance. While it is often important to measure the same behavior in the same way across time, the research needs to test if the floor or ceiling effects could indicate a change in what the measure is indicating. For example, a parent who is no longer reading books to a 5<sup>th</sup> grade child does not indicate the parent is no longer involved in the child educational success. Instead, researchers need to consider ways to measure involvement that can be empirically demonstrated to be invariant across time.

The second critique is in regard to going beyond the findings of her analysis. Most of her samples utilize a cross-sectional data design, and although she mentions the limitation of not demonstrating causation, some of her conclusions imply a causal mechanism. Only one study of parents of 3<sup>rd</sup> and 5<sup>th</sup> grade students adopts a longitudinal design (fall to spring within one school year). However, by the time the children are already in 3<sup>rd</sup> and 5<sup>th</sup> grade, the families have a long history of interacting with the school. Therefore, a longitudinal study that begins in preschool or kindergarten is necessary to demonstrate the parents' own contribution to the child's education and how a teacher encourages or discourages this involvement. Another example of how Epstein goes beyond the findings is her interpretation that a teacher providing more opportunities for parents to be involved is equivalent to more parents actually being involved. We need to understand that process in more detail. There may be parent characteristics that drive involvement at school regardless of the teacher-initiated activities, and there may indeed be specific teacher-initiated activities that promote parent involvement even after accounting for existing parent characteristics. Perhaps the most basic concern with Epstein's strong causal interpretations is that she has not

implemented a randomized intervention or quasi-experimental design to test the specific features of malleable parent involvement strategies. Therefore we do not know whether the strategies she recommends actually produce change in parenting behaviors and children's academic success.

Others have expanded Epstein's theoretical framework in studies of parent involvement and related intervention efforts. For example, Fantuzzo et. al., (2000) used Epstein's model to create a measure of parent involvement. The measure included home involvement, school involvement, and school-based conferencing, which is a parent's ability to keep up to date on how well the child is doing. Fantuzzo and colleagues tested this measure on a Head Start sample at the beginning of the program and six months later. The research findings demonstrated that home-based family involvement was the strongest predictor of child outcomes (e.g., motivation to learn, receptive vocabulary and conduct problems). Dearing (2004) included a 15-item measure of mothers' reported parent involvement in the domains of parent involvement at school, parent involvement at home and family communication with the schools. This intervention study was longitudinal and examined kindergarten parent involvement and fifth-grade achievement. Results demonstrated a moderated relationship between maternal education and parent involvement: mothers with lower education improved their parent involvement the most as a result of the intervention. Fantuzzo et. al., (2013) developed a 21-item scale that validated the 3 domains of parent involvement at home, school and the communication between teacher and parent (i.e., parent conferencing). Additionally, Fantuzzo and colleagues demonstrated the external validity of the measure by relating specific domains of parent involvement to child outcomes: for example, only home involvement was significantly related to receptive vocabulary.

In addition to Epstein's research, there are 3 major models of parent involvement in preschool that need to be reviewed; the models are actual programs that have been implemented and evaluated to some degree. Those programs include Head Start, The Chicago Parent-Child Study Centers and Webster-Stratton's Incredible Years Program with teacher and parent modules.

***Head Start model of parent involvement.*** Head Start uses the school context as an educational environment for the parent as well as the child. Head Start, which started as a summer program in 1965, is a comprehensive preschool educational program that is based on an ecological model on how to support children's success in school. Head Start attempted to change existing educational frameworks by encouraging a program that is broader in nature, in which families become involved in their children's education. Although school-initiated parent activities might seem commonplace today, almost a half a century ago, parents were not as involved in the school. The Head Start program model includes direct education to the child and also provides opportunities for the family and community to be involved in the program. The Head Start model of parent involvement includes all of the key types of parent involvement described in Epstein's model: Head Start provides some medical and dental screening services that are typically under the parent's basic obligations, offers basic communication to parents, encourages parent involvement at school (i.e., volunteering, field trips), attempts to involve parents at home (i.e., specifically guided by teachers to support classroom learning by offering home visitation), and encourages parents to be decision makers by ensuring current parents serve on the policy making school boards. Head Start has clear expectations for all their teachers to actively engage parents and has school level opportunities for learning, including parent educational meetings. Since parent involvement is required and is offered to all parents regardless of marital status or working status there should not be much variability in the teacher practices.

The Head Start model is consistent with Bronfenbrenner's ecological model where the child is at the center of a dynamic environment in which the child affects and is affected by the immediate environments in which he/she spends time (i.e., microsystem). Bronfenbrenner's model is especially important as the child transitions between the home and school environment. Previously, the importance of the direct parent-child experiences at home was discussed. Parents can offer a variety of play and learning materials, and interact in a warm positive style with those materials. These enriching activities help children develop important cognitive skills (Bornstein, 1995; Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001). As children transition into school, the role of parenting changes slightly. Parents are not exclusively interacting with the child or exclusively providing opportunities for the child to experience. Now the child and his/her parents are interacting with an

additional community context and other caregivers (e.g., teachers) (Bronfenbrenner, 1979). So, although the school can be a context for learning and the teacher can provide cognitive stimulation, there is now a need for an interaction between the teacher and parents (i.e., mesosystem). These contexts provide an opportunity for additional resources in the child's development and academic success.

Earlier work by Lamb-Parker and colleagues (1999) developed an exploratory model of parental involvement in Head Start. The model considers the roles of family demographic variables, and parental involvement in Head Start (e.g., at-school parenting practices such as volunteering, home visits, policy council), the home learning environment (i.e., at-home parenting practices such as having the child help with household tasks, understanding children's play, specific learning activities) and parent-child relationships (e.g., warmth, strictness, aggravation). To evaluate a portion of the model, Lamb-Parker evaluated if changes in parenting practices predicted changes in children's school readiness skills. Two specific practices predicted change in children's school readiness skills: play materials in the home and the parent-child relationship predicted children's verbal intelligence and receptive vocabulary, respectively. Unfortunately, Lamb-Parker did not measure any type of at-school parenting practices. At-school practices are of specific use to provide programmatic feedback to Head Start because it could indicate which types of parental involvement are more beneficial for ensuring children's success at school and the program can focus on specific ways to increase those practices. Conceptually, the parenting practices at-school that are more proximal to parent-child interactions (e.g., volunteering, home-visits, parent meetings) should be more strongly related to children's school readiness than at-school parenting practices that are more distal (e.g., policy council). Additionally, Lamb-Parker's model does not include assessment of the relationship between teacher and parent. The relationship between parents and teachers is critical in connecting the children's environments (i.e., mesosystem).

A second evaluation of Head Start is the larger scale evaluation that randomized 3 year olds and 4 years into the program is the Head Start Evaluation Study (U.S. Department of Health and Human Services, ACF, 2010). The Impact Study found significant differences for the group of children who were allowed (i.e., randomly assigned children allowed enroll)



to entered Head Start at 3 years old and those who were not (i.e., received parent at home care or enrolled in another program). Parents who enrolled their child in the Head Start program at age 3 spanked less often, read to their child more often and participated in more family cultural enrichment activities. Children who enrolled at 3 years old also had parents who used less spanking in Kindergarten and scored lower on authoritarian parenting at the end of 1<sup>st</sup> grade. However, there were no significant differences for the cohort that enrolled at 4 years old. Unfortunately, the Impact Study did not evaluate parent involvement at school or the relationship between home and school involvement during Head Start. The Impact Study did evaluate other dimensions of parent involvement during Kindergarten. There were two questions asking teachers about parent participation in kindergarten school activities: 1a) if one or both parents attended school events (e.g., open house, back to school nights, plays) and 1b) if one or both parents volunteered in the classroom or helped on class trips. There were no significant differences in parent participation between either group and parent participation in school activities in Kindergarten. There were also two question asking teachers about school contact/communication: 2a) how often parents initiated contact with you to find out how child was doing or to help out in the class 2b) frequency of contact about child's school problems or behavior problems. There were no significant differences in school contact in Kindergarten. There are a few limitations with these school parent involvement questions. First, since there was no measurement of parent involvement during Head Start, we do not know how parent's behavior might have changed from Head Start into Kindergarten. Second, the school contact/communication questions measure only teacher perceptions of parent involvement. The questionnaire asks how a parent reacts to problem behavior; it did not investigate the proactive role of a parent in the class. Unfortunately, there were no ratings from the parent and the measure did not include any home involvement components.

Recently there have been numerous published studies evaluating the impact of Head Start parental involvement activities. Some have also included solely an evaluation of parent involvement and others have evaluated the impact of parent involvement on children's emergent literacy outcomes or academic success (Bulotsky-Shearer, Wen, Faria, Hahs-Vaughn, Korfmacher, 2012; Castro, et. al., 2004; Hindman, Miller, Froyen & Skibbe, 2012; Wen et. al., 2012). These studies benefit from large sample sizes and include a variety of

measures of center quality. For example, Hindman and colleagues (2012) examined family background predictors of parent involvement using the domains of home, community and school. This research demonstrated the variety of ways parents are involved in Head Start, yet there were no significant findings on the ways centers seek to improve parenting practices. Castro and colleagues (2004) utilized a variety of data gathering techniques (i.e., volunteer logs, parent interviews, teacher questionnaires). Higher classroom quality and teachers with more experience in Head Start predicted greater parent involvement. However, this study did not investigate how parent involvement predicted child outcomes. Wen and colleagues (2012) found most home involvement domains predict initial receptive vocabulary scores but have an inverse relationship with classroom quality. Although these studies have many methodological strengths, they do not have a development theory regarding how specific parenting predict emergent literacy skills. The studies all use a similar technique of summing a variety of practices that may or may not directly relate to the development of emergent literacy skills. For example, a sum of all educational activities at home and any type of community enriching activities (e.g., visits the zoo) was used. Additionally, these studies do not examine teacher ratings of involvement or ratings of the relationship between the teacher and the parent. Careful selection of specific items known to be important to the development of emergent literacy skills is needed.

***Chicago Parent-Child Centers.*** The second program of empirical research on the relationship between parent involvement and preschool children's academic achievement has been conducted on the Chicago Parent-Child Centers (CPCC). The CPCC program consists of preschool and school aged interventions targeting children living in poverty. There are three strengths to the evaluation of the effectiveness of this intervention: the program evaluated long term outcomes in several domains (i.e., educational, health and social domains), has a strong theoretical basis for the children's education and parental involvement components, and calculates the financial savings in addition to the societal improvements by comparing children enrolled in the intervention and a matched group of children. The Chicago Parent-Child Centers utilized a quasi-experimental design to determine the effectiveness of the program. The program was offered through the Chicago Public Schools and federal Title I program funds, which after Head Start makes it the second longest running preschool intervention in the United States (Reynolds, 2000). Title I funds

are awarded to schools with a neighborhoods poverty rate of > 60% low income. The original sample is a group of 1,539 children who participated in a preschool and/or an elementary school program, or who were identified as a community comparison group [matched on race, gender and family income]. This type of matched comparison yielded similar risk factors for each group with the exception of living in a single parent family. Children that participated in the CPCC were more likely to live in a single-parent family.

The purpose of the Chicago Parent-Child centers was to encourage direct parent involvement that was expected to enhance parent child interactions, encourage parent-child attachment to school, and provide social support among parents. A classroom component for parents emphasized the theory of language and literacy development. A comprehensive parent involvement school based initiative in which parent volunteering was mandatory was central to the program's structure (Reynolds, 2000). The philosophy behind mandatory parent volunteering was the expectation that teachers could model adult-child interactions that enhance children's language skills. In addition to the classroom component, every school offered a parent visitation room that was intended to provide an atmosphere in which parents could feel comfortable in the school and socialize with one another (Reynolds, 2000). The program has been evaluated extensively.

The first strength of CPCC research is the extensive amount of longitudinal research and short and long-term follow-up of the participants and a group of comparison children who did not receive the program. The design of the evaluation is complex. Originally the sample included 1539 children (989 CPCC intervention children, 550 comparison group) who attended mixture of preschool and half -day or full day Kindergarten schools. Next, the intervention and comparison group of children entered into elementary schools with an extension of the program into 1<sup>st</sup> through 3<sup>rd</sup> grades, yielding 4 groups of children (i.e., CPCC preschool + CPCC elementary (n=684); CPCC preschool, but no CPCC elementary program (n=305); Comparison group with CPCC elementary (n=166) and Comparison group with no CPCC elementary program (n=384). The evaluation component to the CPCC has continued for more than twenty years, and has evaluated the impact of the program on reading and math achievement from Kindergarten to eighth grade, grade retention, special education placement, high school completion, occupational prestige, income, and adult

crime (Miedel & Reynolds, 1999; Ou, Mersky, Reynolds, Kohler, 2007; Reynolds, 1994; Reynolds & Temple, 1995; Reynolds & Ou, 2011). Three papers investigated the preschool participant group compared with those who did not attend the preschool program (Ou & Reynolds, 2008; Ou & Reynolds, 2010; Reynolds, Temple, Ou, 2010), while the majority focus the evaluation on the preschool and extended elementary program. The majority of the research demonstrates that the CPCC program effectively improved children's academic achievement, high school completion and future occupational success. The evaluation of the child outcome into adulthood has been a major component adding to the strength of the literature of parent involvement. Other research has invested the mechanism of these improvements (Clements, Reynolds, & Hickey, 2004; Ou, Mersky, Reynolds, & Kohler, 2007; Reynolds, 1994; Reynolds & Temple, 1995; Reynolds, 1998; Reynolds, et al., 2011).

The second strength of the CPCC is its focus on understanding the critical mechanisms of program effectiveness. Reynolds, et. al., (2004) examined five mediational pathways, each with an alternative causal hypothesis that could explain which specific features promote sustained educational and occupational success. For example, the cognitive advantage hypothesis is that improved cognitive skills during the intervention lead to greater future gains in cognitive skills (Consortium of Longitudinal Studies, 1983); in contrast, the family support hypothesis is that intervention-related increases in parents' ability and willingness to support children's learning is most important for sustained development (Bronfenbrenner, 1975). Other hypothesized pathways emphasize the importance of intervention-related improvements in social adjustment (e.g., self-regulation skills and learning the expectations of schooling), motivation (e.g., perceived competence; Zigler & Styfco, 1993), and school support (i.e., school quality supports children's learning). Reynolds' empirical research finds support for an integrated model between the cognitive support hypothesis and the family support hypothesis (i.e., predominantly parent involvement). These two mechanisms related to higher grade 6 achievement and fewer grade retentions (Reynolds, et al., 1996), and highest grade completed (Ou, 2005). In models predicting high school completion and adult felony arrest, the school support hypothesis, cognitive advantage hypothesis and family support hypothesis account for a large percent of indirect effects of preschool participation (Reynolds, et. al., 2004; Reynolds & Ou, 2011).

Testing alternative mechanisms as an evaluation strategy is important for program fidelity in ensuring critical components are being offered.

In addition to examining the causal mechanisms to explain improvements in children's academic success, CPCC research also investigated the impact of nesting children within school on academic achievement. Using one of the first multi-level analyses of parent involvement, Clements and colleagues (2004) investigated individual-, program-, and school-level predictors in accounting for CPCC children's 8<sup>th</sup> grade reading achievement, high school completion, and juvenile delinquency. They compared conceptual program models focusing on individual predictors (e.g., teacher rating of parent involvement in 1<sup>st</sup> grade; instructional approach) and school predictors (e.g., percent of low-income families, family stability within a site) as well as a full model. There was very little difference between the individual, school, or full models in accounting for Kindergarten reading achievement. However, for every one-point increase in site-level parent involvement, there was a significant 3.87 increase in children's Kindergarten word analysis scores, corresponding to an effect size of .29. Parental involvement remained a significant predictor for 8<sup>th</sup> grade reading and high school completion in the program model. However, the school and full models explained the largest proportion of variance in 8<sup>th</sup> grade reading achievement and juvenile delinquency. While preschool participation remained a significant predictor of 8<sup>th</sup> grade reading achievement, parental involvement only approached significance in the full model. This result must be interpreted with caution. A one-item global rating of parental involvement in 1<sup>st</sup> grade does not reflect the activities of parental involvement during preschool. These results suggest that more investigation is warranted: if a one-item rating of parent involvement predicts 8<sup>th</sup>-grade reading and high school completion, certainly a more detailed analysis of specific types of parental involvement is worth exploring further.

The final strength of the CPCC program evaluation has been the cost-benefit analysis. At age 26 the preschool program provided an 18% annual return for every dollar invested in the program (approximately \$10 per child savings). The school aged program provided a smaller but important 10% annual return (approximately \$4 per child savings) (Reynolds, et al., 2011). Evaluation tools such as cost-benefit analysis are critical to policy

makers when deciding where to invest public dollars. This economic impact is a relatively unique approach to program evaluation, but important during tight economic environments.

Despite the enormous strengths the CPCC program has in longitudinal evaluation, understanding the mechanism of change, and the benefit of investment of economic resources, there are a few limitations to the evaluation. First, despite the program being comprehensive in parent involvement, and beginning at age 3 years (i.e., in preschool) there are no measures of preschool parent involvement. One study asked retrospective reports of parent involvement in preschool and kindergarten almost 10 years after the child graduated from the program (Miedel & Reynolds, 1999). Most measures of parent involvement are between 1<sup>st</sup> grade and 3<sup>rd</sup> grade. Second, although Reynolds has three empirical papers investigating parent involvement, most of the studies that investigate the family support hypothesis use only a single item teacher report measure “how involved is this parent in the child’s education at school” (Clements, Reynolds, & Hickey, 2004; Ou, Mersky, Reynolds, Kohler, 2007; Ou & Reynolds, 2010; Reynolds, 1989; Reynolds, 1991; Reynolds, 1995; Reynolds, Temple & Ou, 2010). Epstein (1990) suggests a broader definition of parent involvement than just school involvement. Working parents may be more involved in supporting their parent’s education at home. Further, a single item question does not provide a further understanding of what is in the “black box” of parent involvement. What specifically is important about the various components of parent involvement that improve children’s educational attainment? Especially in this CPCC program that offered such a wide variety of ways to involve parents at school, more research is needed to understand specifically what matters the most.

Despite these limitations, CPCC research has demonstrated that the family support hypothesis is an important contribution to many outcomes and worth further investigation. This paper will utilize a short term longitudinal design and investigate individual components of preschool parent involvement, reported by both the teacher and the parent.

***Webster-Stratton’s parental involvement intervention.*** Webster-Stratton, Reid, & Hammond (2001) conducted a randomized control study of families with at least one child attending Head Start. Researchers investigated the effectiveness of parent and teacher training in a prevention program called The Incredible Years. Their measures of parental

involvement included the *frequency* of parents' involvement with their children, and parents' *bonding/satisfaction* with teachers and the school (21 items, including the parents' sense of connection with the teacher and experience of feeling welcomed in the classroom). The intervention included a basic program with video vignettes and discussion of relevant topics. The parenting program also included a booster training to help with the transition from Head Start to kindergarten. The topics of this booster session included reading with children using adaptations of a dialogical interactive reading approach (Whitehurst & Lonigan, 1998), and working successfully with teachers. Webster-Stratton and colleagues (2001) also included a training session for Head Start teachers aimed at increasing levels of parent participation. The researchers found that mothers who participated in the program had significantly lower negative parenting scores and significantly higher positive parenting scores than did mothers from the control group. Parent-teacher bonding was significantly higher for the experimental group than the control group. However, at follow-up—during the transition to kindergarten—the parents in the experimental group reported less bonding with kindergarten teachers. These findings suggest that educating teachers may be key to increase parental involvement, and expanding the intervention to Kindergarten teachers may be necessary in maintaining these positive parent-teacher interactions. However, it is unclear if stronger parent-teacher bonding is related to any child outcomes.

This study has several strengths, including the explicit focus on providing support of parent-child book reading. One of the most accepted parent-child book reading interventions is Whitehurst's "Dialogical Reading". The intervention targets language development, specifically the expressive language of children. Contrary to some of the research that focuses primarily on the *frequency* of book reading, the purpose of this program is to teach parents as well as Head Start and Kindergarten teachers *how* to read in a way that promotes the active participation of the child. Whitehurst, Epstein, Angell, Payne, Crone, and Fischel (1994) conducted an intervention with Head Start families that combined a dialogical reading video demonstration and a phonological awareness curriculum. They found significant differences in oral language skills between children who participated in the intervention and those in the control group. Most importantly, the involvement of the parents mediated the children's improvement: children benefited more when family members were involved in the reading program.

The interventions conducted by the Whitehurst group suggest that increasing the frequency and improving the quality of parent-child book reading through a school-based parenting program can be effective in improving children's expressive vocabulary. However, there is very little theory on how such an intervention needs to be generalized to other preschools and/or elementary schools. Whitehurst's program appears to be a stand-alone activity: it is offered to the parents and offered to teachers, but it does not incorporate parent-teacher communication. The school, therefore, appears to be a context to improve parent-child interactions, at least during book-reading activities. Webster-Stratton's program attempts to bridge that gap by encouraging the home-school connection. However, a major limitation of the program is high attrition: nearly 40% of the intervention-group parents did not attend a single day of the program. Certainly, programs need to adjust to the needs of families if any home-school partnership is to be developed. Also, the Webster-Stratton program does not investigate the other broader areas of parental involvement in Head Start, and does not measure the outcomes of emergent literacy skills. Despite these limitations, there are benefits from the strength of using a randomized control trial to test a parent involvement program.

***Other models of parental involvement.*** There are several more intervention evaluation studies that include a parent involvement component, such as the Abecedarian, Perry Preschool, LIFT and Fast Track projects. While the longitudinal evaluations of these multicomponent interventions demonstrate significant program effects, oftentimes the exposure to the parent involvement component is not the focus. The Abecedarian intervention is a longitudinal intervention study. The original sample was approximately one hundred children randomized into 4 groups (i.e., preschool only from infancy to 5 years, school based only from 5 to 8 years, preschool and school based from infancy to 8 years, and control). The preschool only cohort scored higher on standardized reading assessments and was retained less often as compared with control group children (Campbell & Ramey, 1994). Although this program provided parents a home visitor who modeled positive parent child interactions during play and book reading, there were no significant differences in home environment quality during the preschool years. This lack of association is especially important since the intervention mothers were able to complete their education compared with the mothers in the control group. Improving the mother's education may directly



change interactions with her child and may also have a cascading effect that enabled the mother to encourage her child to continue his/her education (family support hypothesis). Unfortunately, the program evaluation design is not able to disentangle the impact of the preschool program from changes in the home environment.

The High Scope/Perry Preschool program is one of the strongest examples of how a preschool intervention has had long term benefits. The Perry preschool program has released the latest finding for participants at the age of 40 and has found that participants had fewer arrests, were more likely to buy a home, had fewer out of wedlock births, received less public assistance, earned more money per month and were more likely to graduate from high school (Schweinhart, et al., 2005). A cost-benefit analysis suggests that for every dollar spent on the curriculum, taxpayers saved \$13. This program is another example of a well implemented classroom program, which included teachers in the Perry Preschool program making weekly home visits (once per week for one and a half hours) to participating families. Unfortunately this evaluation design also did not focus on measures of parent involvement and the parent involvement component has received very little attention empirically as a possible mechanism to produce such positive effects (Seitz, 1990).

A multi-component intervention which included parent training at home visiting was the Fast Track intervention. Fast Track was a multi-site intervention for children at-risk for conduct problems. Fast Track researchers made an important contribution to the study of parent involvement by developing an empirically validated measure. Kohl, Lengua & McMahon (2000) critically reviewed and integrated many theories from the current literature of parent involvement and developed a theoretically driven assessment measure. They focused on using multiple reporters of parent-initiated contact that included the quality of interactions with parent. Other factors included teacher's perception of parent, parent involvement at home and at school, and parent endorsement of school. Their confirmatory factor analysis empirically validated these six theoretically distinct areas of parent involvement; furthermore these factors were moderately correlated ( $r$  ranged between .04-.61). While it was difficult to disentangle the contribution of parent involvement from the other components of the Fast Track intervention, they did find that teachers rated parent involvement in school was greater for the intervention group, so children who were at risk

for academic failure had parents who were more involved than the parents than in the control group (CPPRG, 2004).

## **Research Hypotheses**

This dissertation has three research questions, each associated with several specific hypotheses regarding participation in the Harrisburg Preschool Program, patterns of parent involvement and children's emergent literacy skills.

**Research question 1.** Does the duration of preschool program participation predict higher levels of parent involvement at home (i.e., emergent literacy parenting practices) and higher levels of parent involvement at school?

H1a: At the age 4 fall assessments, parents who enrolled their children for 2 years of the preschool program will have higher scores (i.e., at the beginning of their 2<sup>nd</sup> year) on parent-reported emergent literacy practices at home and frequency of library visits compared with parents who enrolled their children for 1 year of the program beginning at age 4 (i.e., at the beginning of their 1<sup>st</sup> year).

H1b: At the age 4 summer assessments and pre-school teacher assessments, parents who enrolled their children for 2 years of the preschool program will have higher scores (i.e., at the end of their 2<sup>nd</sup> year) on parent-reported emergent literacy practices at home (e.g., book reading, talking activities, frequency of library visits), at-school (e.g., showing up- volunteering in class, field trips, school events), higher teacher ratings on the quality of parent-teacher relationship, and higher teacher ratings of parental encouragement of education compared to parents who enrolled their children at age 4 for 1 year of the preschool program (i.e., at the end of their 1<sup>st</sup> year).

H1c: Parents who enrolled their children for 2 years of the preschool program will have higher ratings on the kindergarten teacher assessments on the quality of parent-teacher relationship and higher teacher ratings of parental encouragement of education compared to parents who enrolled their children for 1 year of the preschool program.

**Research question 2.** Does parent-teacher interaction quality during the first year predict higher levels of parental involvement in the second year?

H2a: Parents who were rated as having more positive parent-teacher interactions (as rated by the teacher the first year) will report higher levels of their own involvement in emergent literacy activities (i.e., book reading, talking activities, visits to the library) and parent ratings of at-school involvement (e.g., showing-up and learning opportunities) in the second year of the program (after controlling for levels of first year involvement).

H2b: Parent education level will moderate the association between parent-teacher interaction quality and parent involvement such that the association will be strongest for parents with less than a high school education.

**Research question 3.** How do parent home involvement, school involvement, and parent-teacher communication relate to the development of children's emergent literacy skills?

H3a: More frequent home involvement reported in the fall and summer (i.e., emergent literacy parent-child interactions) will predict children's language skills in Kindergarten. Specifically, parent activities that involve print and reading (e.g., book reading, library) will be most strongly associated with print skills whereas activities that are primarily oriented around oral language activities (e.g., singing, storytelling) will be most strongly associated with vocabulary.

H3b: Preschool parent school involvement in which proximal adult-child interactions occur (i.e., volunteering, field trips, attending school wide activities) will be more strongly associated with emergent literacy skills than will parent involvement in which no direct parent-child interactions occur (i.e., home visits, parent meetings).

H3c: Teachers' perceptions of parent encouragement of education during the preschool program are expected to predict higher receptive vocabulary scores and other emergent literacy skills in Kindergarten.

## CHAPTER 2- METHODS

This sample of preschool children was recruited from an urban community with a 2000 census population of about 50,000 in the Northeastern United States. Two cohorts of children (i.e., cohort 1 beginning in 2002, cohort 2 beginning in 2003) were followed longitudinally from entry into the preschool intervention (hosted within public elementary schools) into Kindergarten.

### Sample

This study is a part of an evaluation of a preschool program in a high-poverty urban community in which approximately 90% of students are eligible for free or reduced lunch. The sample includes two cohorts of families that enrolled their children for one or two years in the district's new preschool program. The program served children ages 3 and 4 years and was delivered in four of the district's 12 buildings (12 classrooms) during the 2002–2003 academic year and the original four plus an additional 2 buildings (26 classrooms) in the 2003–2004 academic year. In the first year of the program, all participants met income eligibility for Head Start. In the second year, the district wanted to offer the program to more children in the community, so enrollment was not restricted by income and therefore, 51% of the cohort met the Head Start eligibility criteria. Parents who enrolled their children in the program were contacted to participate in the study.

In total, three hundred sixty five parents enrolled in the evaluation. In the first year of the program, parents of 165 children across 12 classrooms (93% of attendees) agreed to participate in the study (i.e., 104 entered at age 4, 65 entered at age 3). In the second year, parents of 190 newly enrolled children from 19 classrooms (74% of attendees) agreed to participate (i.e., 99 entered at age 4; 96 entered at age 3). Across the two cohorts, 78% (N=283) of all children remained in the district in kindergarten (125 who entered at age 3 and 158 who entered at age 4). Approximately 79% of the students who entered the program at age 3 remained in the program for two years. Table 1 summarizes the longitudinal sampling schedule. Tests of attrition comparing those with and without

kindergarten academic data across all covariates and pre-test receptive vocabulary age standardized scores revealed no significant differences.

After implementing missing data and propensity score matching procedures (described in detail below), the total analytic sample included 290 participants (52.8% female). The ethnically diverse sample was primarily African American (71.7%) and Hispanic (17.2%). The primary caregivers were predominantly biological mothers (94.8%) with a high school diploma or higher (73.1%). Other demographic information is presented in Table 2. Raw descriptive statistics for parent involvement are presented in Table 3.

## **Procedures**

Parents were assessed twice per year during the preschool program. Fall interviews (October-November) included questions about activities with children and literacy activities in the home. The fall parent interviews were conducted by preschool teachers. Summer interviews (June-July) were conducted by research assistants with a bachelor's degree or higher. The parent summer interview included questions about the parent's involvement in the preschool program, satisfaction with the program and activities with his/her child. Preschool teachers completed measures on the child and family each spring (May) and were asked to rate the levels of parent involvement. Kindergarten teachers completed measures on the children and families in the late fall (November) with questions about parent involvement. Children were assessed annually by independent contractors with a bachelor's degree or higher: at the beginning of preschool (October-December), at the beginning of the second preschool year (for those children that entered at three years of age) and again at the beginning of Kindergarten (October-December).

**Enhanced preschool program model.** The existing preschool program was offered by a community in central Pennsylvania. Coinciding with the No Child Left Behind Act of 2001, in 2000, an unprecedented court case ruled that the mayor take control over a failing school district (Baker, 2006). By 2002, the school district initiated a free preschool program with the long-term goal of improving academic achievement and high-school graduation rates. The district incorporated the existing Head Start program that was already offered in the community to be expanded to more children and be physically located in the public

elementary schools. The preschool program was under the direction of district employees. The district's initiative made the preschool program available to more preschool aged children in the community. They also implemented several early childhood best practices in education. The preschool program was initially introduced into four of the district's twelve elementary schools. In the second year of the study, the preschool program was extended into two additional schools. There were 12 preschool classrooms (across 4 schools) in the first year of the program, and 26 preschool classrooms (across a total of 6 schools) in the second year of the program for a total of 38 classrooms. Each classroom was staffed by two teachers, one with a bachelor's degree with a certificate in Early Childhood Education and the other a Head Start teacher (who was not required to have teaching credentials). In the first year of the program there were twenty four teachers (12 district and 12 Head Start teachers). A small percentage (i.e., 15%) of the district teachers had master's degrees compared to 11% of Head Start Teachers in the FACES 2000 sample (Zill, 2006). Eighty five percent of the district teachers and 42% of the Head Start teachers had a bachelor's degree compared to 28% of Head Start teachers in the FACES 2000 sample (Zill, 2006). There was very little turnover in staff between the first and second year of the program (19 of the original 24 teachers returned). In total, the second year had 44 teachers who taught in 22 classrooms with intervention children. The credentials for the teachers were similar between year 1 and year 2, 10% of district teachers had a master's degree, 90% of district teachers and 55% of Head Start teachers had at least a bachelor's degree.

The student teacher ratio was low (8:1) with a maximum of 16 students per classroom. The five hour program was offered 5 days/week during a 9-month school year and included an optional 6-week summer program. As an additional service to support working parents, wrap-around childcare was offered before and after school. The High Scope Foundation curriculum (Weikart & Schweinhart, 1997) was supported by a social-emotional curriculum (i.e., Preschool Promoting Alternative THinking Strategies (PATHS); Domitrovich, Greenberg, Kusché, & Cortes, 2005) which included lessons to promote the expression, understanding, and regulation of emotions for preschoolers. Finally, the preschool program included a Balanced Literacy framework which provided several opportunities (e.g., shared reading, guided reading) for explicit instruction to children to experience reading and writing.

Consistent with the Head Start model, the program also included three home visits and two parent-teacher conferences per year. Goals for the child were set with the parent initially and the child's progress toward meeting goals was discussed during home visits.

Informational resources that are provided are based on the goals developed by parents for their own families. Some resources include nutrition and health resources (e.g., lead poisoning, CHIP and WIC, healthy eating). The information provided at home visits included: yearly calendar (e.g., upcoming community events) and the parent handbook (i.e., information on all aspects of the program and policies for families and children, plus childhood illnesses, parent participation options), and parent handouts from the PATHS curriculum. Specific activities that can be done at home to further a child's progress are also provided to the parent at home visits.

Opportunities for parents to volunteer include spending time in the classroom for a specific part of the day or activity and then time discussing the activity with the teacher. For instance, parents could come in for work time and spend time with the children, then "debrief" with a CD about what the children were learning during their play. Or the parents could come in for an activity around a particular children's book, and then the book will go home with the parent along with suggestions for what to do at home around the book's theme. The local library conducted a Discover Math and Science workshop with each school and some teachers chose to invite the parents to come in for these simple math-related activities using everyday materials. For parent meetings, all centers had a parent leadership workshop and an orientation to the program and all the components of Head Start (health, social services, education, etc.). Some sites survey their parents to see where their interests are before setting up workshops or presentations. There is a monthly training calendar posted at each center on the parent board. School events included monthly literacy nights. Literacy nights focused on the importance of reading with children, developing a love for reading at home, modeling reading activities, promoting literacy in the home, and engaging in reading aloud with children.

## Parent Measures

**Demographics.** Demographic information for this sample was gathered from the Head Start/ Preschool enrollment forms parents completed the spring prior to entering preschool. Additional demographic information was also collected at the fall parent interview. Demographic information included the language spoken at home, annual income verification, benefits from the government (e.g., WIC), the number of people living the home, the relationship between the caregivers, race of parent and child, and child's birth weight.

Parental Education level was obtained at the fall preschool interview (pre-test) when the family enrolled in the evaluation. Parents were asked to report on a 6-point scale their highest educational level completed. Responses ranged from 8<sup>th</sup> grade or less to graduate school. Scores were recoded for below high school education, high school education, and post-high school. Dummy variables were created for certain analysis with high school as the reference group and less than high school and more than high school in the model.

**Home involvement.** Parents were interviewed in the fall of each preschool year and the summer after the end of each preschool program year. Thus, 3 year olds have 4 assessments; 4 year olds have 2 assessments. Parent interviews conducted during the summer months had more extensive missing data, with valid data for only approximately half the sample. Tests of attrition comparing parents with and without summer interviews following each preschool year across all demographic covariates yielded no significant differences. Several measures from the parent interview assessed home involvement:

***Literacy Items in the home.*** These items were assessed in each fall in the preschool parent interview. Parents were asked (yes or no) if they had the following items in their home: magazines for children, magazines for adults, newspapers, catalogs, religious books, comic books, dictionaries and/or other books. A sum total of all items was computed (i.e., potential scores ranged from 0-8).

***Fall and summer book reading to child- number books/frequency.*** At each parent interview, parents were asked two questions about their weekly book reading: (1) the number of books read per week (none, 1-2, 3-5, 6-10, 11-15, and more than 15); and (2) the



frequency of book reading (not at all, once or twice a week, three to six times a week, every day, twice a day, or more than 3 times a day). These two items were moderately strongly correlated in both fall ( $r = .67$ ) and summer ( $r = .55$ ), so they were averaged into a single composite score at each time point.

***Fall and summer book reading to child- # minutes.*** A single item asked parents “For about how long does [Child’s Name] enjoy being read to at a sitting?” Parents provided responses in minutes. Scores were subjected to a square root transformation to reduce skewness.

***Fall and summer home talking activities.*** At each interview parents reported how many times per week they engaged in each of six verbally supportive activities, each scored on a 3 point scale (i.e., 0, 1-2 times, 3 or more times): told stories; taught letters, words or numbers; taught songs or music; talked about what happened in school; talked about TV programs or videos; and played counting games like singing songs with numbers or reading books with numbers. A composite was formed by summing scores across the six activities.

***Fall and summer visits to the library.*** At each interview, parents reported the number of times they visited the library with their child in the past month. Response options were never, 1 or 2 times, or 3 or more times. *Fall/ Summer composite variables.* For purposes of testing hypothesis three, a composite was created for each fall/ summer home activities. This was justified since the fall/ summer home activities were moderately correlated ( $r = .26 - .42$ ) and to create a parsimonious model.

**Parent school involvement- parent report.** (adapted from Fast Track (Corrigan, A., 2002; CPPRG, 1991; Miller-Johnson & Maumary-Gremaud, 1995; and FACES). Frequency of involvement at the child’s school was assessed only during the summer interviews. Parent involvement at school was assessed with two composite scores: summarizing how many times since the beginning of this year the parents engaged in each of 5 distinct activities. Showing-up Activities were defined as those that required the parent’s physical presence at the school (i.e., volunteering in the class, volunteering on field trips, and attending school wide events). In contrast, Learning Activities involved explicit teaching or discussion of parenting skills (i.e., parent meetings, home visits). For each

activity, response options ranged from 0=Not yet, 1=Once or twice, 2=Several times, 4=About Once a Month, 8=At least once a week. A composite sum score was created.

**Parent involvement- Teacher report.** Preschool and Kindergarten At-School Practices. This measure, which was adapted from Fast Track (Corrigan, A., 2002; CPPRG, 1991; Miller-Johnson & Maumary-Gremaud, 1995), assesses the teacher's perception of their relationship with each parent. Teachers completed this measure in the spring of each program year. Kindergarten teachers completed the same measure in the late fall. The two factors were:

***Parent-Teacher Relationship.*** This subscale assesses the teacher's perception of the quality of interactions with the parent. Three items were asked (i.e., how interested is the parent in getting to know you, how well do you feel you could talk to and be heard by parent, if you had a problem with the child how comfortable did you feel talking to parent ( $\alpha = .86$ ). Response options were 0=Not at all; 1=A little; 2=somewhat; 3=well; 4=Very well.

***Parent Encourages Education.*** This subscale assesses the teacher's perception of how much the parent seems to encourage the child to learn and value education. Four items (i.e., feel the parent has same goals for his/her child that school does, parent does things to encourage education, how involved parent is in the classroom, and how important is education to the family) were asked ( $\alpha = .82$ ). Response options were 0=no/ don't know; 1=a little; 2=some, 3=very, 4=extremely.

## **Child Outcome Measures**

**Receptive vocabulary.** The Peabody Picture Vocabulary Test-Revised (PPVT-III; Dunn & Dunn, 1997) is a well-known and widely used measure of children's receptive vocabulary. This measure was assessed in the fall of each year of the preschool program for both 3 years olds and 4 year olds and in the fall of Kindergarten. The measure consists of 175 items. The child is presented four drawings and asked to point to the picture that best illustrates the word presented orally by the examiner. The published split-half reliability

coefficient for the revised PPVT was .71 for children 48 to 53 months of age (Dunn & Dunn, 1997). A total score of correct responses was calculated and converted into an age-standardized score ( $M = 100$ ,  $SD = 15$ ).

**Decoding skills & letter knowledge.** The Letter-Word Identification subtest of the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R; Woodcock & Johnson, 1989) was used to assess children's decoding skills and letter knowledge. This measure was assessed in the fall of the preschool program for only 4 year olds and in the fall of Kindergarten. This measure is not validated for use with 3 year olds and was not assessed at that age. The 23-item scale requires children to identify symbols, nine letters, and 10 words containing two to four letters. Children were asked to point at the appropriate picture that represented the stimulus. Each of the 23 items is scored with a 0 for incorrect responses and a 1 for correct responses. A total correct score was calculated and converted into an age-standardized score.

## **Data Analysis**

**Propensity score matching.** Because participants were not randomly assigned to enter preschool at age 3 or age 4 years old, other strategies were implemented to attempt to create equivalent groups. A propensity score for each individual was created. A propensity score is defined as the probability of receiving the treatment (i.e., 2 years compared to 1 year) given a set of observed covariates. Specific strategies were followed (Lanza, unpublished) to select possible covariates (i.e., confounders) that would predict both treatment (e.g., years of program) and the outcome. Stuart (2010) recommends selecting variables to include in the propensity model based on theory and previous research (Rubin, 2001). Stuart recommends excluding the observed outcome variables from the propensity model during this stage to avoid any appearance of variable selection based on effects. Therefore, the covariate selection was examined without any dependent variables in the calculations. All variables included in the propensity score were measured before entrance into the intervention (Lanza, unpublished). A large set of variables was included to predict whether a participant would enroll for 2 years of the program (i.e., enter at age 3) or enroll for 1 year (i.e., enter at age 4). Non-significant predictors were not removed from the model,

Stuart suggests it is better to err on the side of including too many variables because there is little cost to include unrelated variables whereas excluding an important predictor could increase the bias with unmatched groups. It is assumed that the propensity score includes all the confounders in the treatment selection.

Propensity scores were calculated by using a logistic regression with years of program as the dependent variable (i.e., entered at 3=1; entered at 4=0) and 19 variables (listed in Table 2) as the predictors. The unstandardized residuals from the regression were saved and used as the propensity score. In addition to calculating the propensity score for use with the matching, the propensity score was also included in the model as a covariate. D'Agostino (1998) suggests that including the propensity score in the model helps to protect the model from misspecification and is considered a “double robust” method (Kang & Schafer, 2007).

**Matching process.** There are several ways propensity score can be used to create matched groups. Inverse probability of treatment weighting [IPTW, Hirano & Imbens, 2001] and subclassification (Rosenbaum & Rubin, 1984; Wen, 2012) are among some of the most popular strategies. The current study utilized an optimal matching procedure (without replacement) to match participants one-to-one from both groups. One-to-one matching without replacement means that each individual could only be matched once, resulting in two groups of identical size. There is a concern that matching one-to-one removes valuable participants from the analysis but Stuart (2010) argues that one-to-one matching without replacement increases precision and ensures groups are similar. The optimal matching procedure minimizes the overall distance in the propensity scores between *all* matched pairs. This approach is recommended over nearest neighbor matching to achieve balance (Harder et al., 2010; Stuart, 2010). One-to-one matching requires that each child in the intervention group (i.e., 2 years of preschool) be matched to one child in the control group (i.e., 1 year of preschool). Of the original 365 children, 165 children were in the intervention group (i.e., enrolled for 2 years) and 200 children were in the control group (i.e., enrolled for 1 year of preschool). Among the 165 children in the intervention group, 18 participants were missing more than 83% of the parent and teacher interview data and were excluded from the matching procedure, leaving 147 children available for matching. Similarly, among

participants in the control group, 12 participants were missing more than 83% of the parent and teacher interview data and were excluded from the matching procedure, leaving 188 children available for matching. With 147 eligible participants in the intervention group and 188 eligible participants in the control group, the maximum possible number of matched pairs (using one-to-one matching) was 147. For two individuals in the intervention group it was not possible to identify an adequate matched case in the control group. After this matching procedure, 43 cases in the control group were left unmatched and were not utilized in the subsequent analyses. Thus equivalent groups of 145 participants who enrolled for 2 years of the preschool program plus a matched sample of 145 participants who enrolled for 1 year of the preschool program were included in the analysis. To examine the quality of the propensity matching, the box plot and histogram that indicated overlap of the propensity scores between groups was visually examined. One way to evaluate the quality of the propensity matching procedure is also to examine the difference between the means of the propensity scores before and after matching. In the current study, the initial difference was .08, approximately half of the standard deviation ( $SD = .14$ ). After matching, the difference between the mean propensity scores dropped to .03 ( $SD = .12$ ). The match caliper (i.e., propensity score distance) used in the current study was .10, so pairs were within .10 of one another. According to Rosenbaum and Rubin (1985), a caliper of .20 removed 98% of the bias in normally distributed covariates. Additionally, we assessed the balance (Rosenbaum & Rubin, 1985) of each of the predictors of the propensity before and after matching to confirm that predictors remained non-significant after matching. There were no significant differences found. After the matching procedure, several steps were taken to account for missing data.

**Multiple imputation.** Although there was relatively complete data for children's academic skills, parent interviews conducted during the summer months had more extensive missing data, with valid data for only approximately half the sample. Tests of attrition among parents with and without summer interview across all demographic covariates also yielded no significant differences. Multiple imputation is a well-established procedure to arrive at unbiased estimates of population parameters (e.g., variances, covariances) planned significant quantities of data are missing (Graham, Cumsille, Elek-Fisk, 2003). In contrast, Graham and colleagues (2003) note that listwise deletion (i.e., using only complete cases)

results in biased estimates of population parameters and should not be used in general. Missing data for the parent interview were thought to be Missing at Random (MAR) (Little & Rubin 1987). The definition of missing at random proposes that data is missing but the cause of the missingness is correlated to a variable that is measured in the study and therefore can be included in the missing data model. Although there is no way to know for certain why a parent may not have been available during the summer months, we expect similar variables included in the propensity analysis could capture a variety of reasons (e.g., lower education). Multiple imputation procedures recommended by Graham (2012) were followed. Rounding was not conducted at the recommendation of Graham, who suggests imputation is designed to restore lost variability and rounding adds error variance back into the model. Graham (2012) suggests including both variables in the analytic model and additional auxiliary variables in the missing data model. He explains that good auxiliary variables are those that were measured at previous waves. The auxiliary variables included in the model were the propensity score and other demographic information. Variables for both parents (i.e., fall and summer) and teacher ratings (i.e., summer) were also included in the imputation model. Variables in the model were either dichotomous dummy variables or continuous. Missing data patterns were examined. For the group entering preschool at age 3 years, 31% of the cases had complete data, and 12% had the least amount of data (i.e., eighteen of the thirty-four variables). For the group entering preschool at age 4 years, 46% of the cases had complete data and 1% had the least amount of data (i.e., twenty-one of the thirty-four variables). Thus, imputations were conducted separately for the two groups and then merged together for analysis. To account for the nested design, dummy variables for each school were included in the imputation in one model and excluded from the second model for each program year. Graham (2012) suggested this analytic technique will help to minimize the standard errors due to the nesting of children within schools. The convergence criteria was set at  $1e-5$  and maximum iterations was set at 1000. Convergence was achieved in all models. MCMC Diagnostics were examined and appeared acceptable (i.e., trace plots were rectangular in appearance).

Effect sizes. Effect sizes were calculated using Cohen's  $d$  (Cohen, 1988) by taking the difference between the adjusted means for each group and dividing it by the pooled standard

deviation (where the standard deviation is equal to the standard error multiplied by the square root of the sample size).

Table 1

Longitudinal Measurement Design: Participant Age/Grade at Each Assessment.

Cohort	Age at Entry	Fall 2002	Summer 2003	Fall 2003	Summer 2004	Fall 2004	Summer 2005	Fall 2005
		Child Parent	Parent Teacher	Child Parent	Parent Teacher	Child Parent	Parent Teacher	Child Parent
1	4 years (n=104)	4	4	K <sup>a</sup>				
	3 years (n=66)	3	3	4	4	K <sup>a</sup>		
2	4 years (n=96)			4	4	K <sup>a</sup>		
	3 years (n=99)			3	3	4	4	K <sup>a</sup>

Note: Entries indicate participant age (3 or 4 years) or grade (K=Kindergarten) at each assessment. Child= Child assessment; Parent=Parent Interviews; Teacher=Preschool Teacher Ratings; <sup>a</sup>= Kindergarten Teacher Ratings of Parent Involvement in Fall

Table 2

Participant Characteristics for Children Who Attended One or Two Years of Preschool Used in the Matched Propensity

	Enhanced Preschool		
	One Year <i>n</i> = 145	Two Years <i>n</i> = 145	Combined <i>n</i> =290
Gender			
Female	46.2%	48.3%	52.8%
Ethnicity			
Black	72.4	71.0	71.7
Hispanic	17.2	17.2	17.2
Mixed: Black/White	4.1	4.8	4.5
Birth Weight			
Low (below 5.5. lbs.)	13.1	18.6	15.9
Relationship to Child			
Mother	95.9	93.8	94.8
Father			
Family Type			
Two Parent	19.3	21.4	20.3
Race of Caregiver			
Black	73.1	72.4	72.8
Hispanic	14.5	11.7	13.1
Primary Caregiver Education			
Less than High School	29.0	24.8	26.9
High School	42.1	41.4	41.7
More than High School	29.0	33.8	31.4
Language			
English	91.7	93.1	92.4
Spanish	5.5	4.8	5.2
Below Poverty Line	81.4	72.4	76.9
Receives WIC	59.3	55.2	57.2
Eligible for Head Start	77.9	66.9	72.4
Family Size	3.87 (1.41)	3.76 (1.40)	3.81 (1.40)



Table 3

## Parent and Teacher Report of Parent Involvement (Before Imputation)

	Entered Age 4 One Year of Program	Entered Age 3 First Year of Program	Entered Age 3 Second Year of Program
Pre-test Receptive Vocabulary	83.88 (13.29) <sup>a</sup>	85.56 (13.69) <sup>a</sup>	n/a
Parent Home Involvement			
Literacy Items in the Home	5.63 (1.88) <sup>a</sup>	5.66 (1.77) <sup>g</sup>	5.65 (1.83) <sup>k</sup>
Fall Book Reading to Child (# Books/ Freq)	2.07 (0.98) <sup>b</sup>	2.52 (0.95) <sup>h</sup>	2.38 (1.03) <sup>l</sup>
Fall Book Reading to Child (# Minutes)	4.69 (1.62) <sup>b</sup>	4.38 (1.46) <sup>i</sup>	4.86 (1.51) <sup>m</sup>
Fall Talking Activities with Child	9.60 (2.11) <sup>a</sup>	9.85 (1.89) <sup>g</sup>	10.12 (1.89) <sup>n</sup>
Fall Visits to the Library	0.36 (0.58) <sup>b</sup>	0.35 (0.54) <sup>t</sup>	0.44 (0.61) <sup>n</sup>
Parent Home Involvement			
Summer Book Reading to Child (# Books/ Freq)	2.28 (0.99) <sup>e</sup>	2.51 (1.03) <sup>q</sup>	2.50 (0.87) <sup>p</sup>
Summer Book Reading to Child (# Minutes)	4.47 (1.46) <sup>e</sup>	4.34 (1.50) <sup>q</sup>	4.48 (1.19) <sup>p</sup>
Summer Talking Activities with Child	8.68 (2.30) <sup>e</sup>	9.38 (1.91) <sup>q</sup>	9.31 (1.96) <sup>p</sup>
Summer Visits to the Library	0.45 (0.61) <sup>e</sup>	0.54 (0.75) <sup>q</sup>	0.66 (0.72) <sup>p</sup>
Parent School Involvement			
Showing-up Activities (Volunteer in Classroom, Field Trips, School-Wide Events)	2.79 (3.24) <sup>e</sup>	3.01 (2.19) <sup>q</sup>	3.16 (1.92) <sup>p</sup>
Learning Activities (Home Visits, Parent Meetings)	3.40 (2.17) <sup>e</sup>	3.31 (3.80) <sup>q</sup>	3.92 (3.18) <sup>p</sup>
Preschool Teacher Ratings of Parent Involvement			
Parent-Teacher Relationship	2.96 (0.88) <sup>b</sup>	2.97 (0.89) <sup>a</sup>	2.92 (0.92) <sup>h</sup>
Parent Encourages Education	2.57 (0.97) <sup>b</sup>	2.51 (1.02) <sup>a</sup>	2.73 (0.98) <sup>h</sup>
Overall Z-score Parent-Teacher Involvement	-0.13 (0.79) <sup>b</sup>	0.04 (0.71) <sup>r</sup>	0.13 (0.66) <sup>h</sup>
Kindergarten Teacher Ratings of Parent Involvement			
Parent-Teacher Relationship	2.61 (1.05) <sup>f</sup>	n/a	2.54 (1.30) <sup>e</sup>
Parent Encourages Education	2.55 (1.29) <sup>f</sup>	n/a	2.80 (0.90) <sup>s</sup>
Overall Z-score Parent-Teacher Involvement	-0.04 (0.87) <sup>f</sup>	n/a	0.05 (0.80) <sup>s</sup>

<sup>a</sup> N=138; <sup>b</sup> N=136; <sup>c</sup> N=132; <sup>d</sup> n=66; <sup>e</sup> n=102; <sup>f</sup> n=108; <sup>g</sup> n=137; <sup>h</sup> n=128; <sup>i</sup> n=129; <sup>j</sup> n=137; <sup>k</sup> n=96; <sup>l</sup> n=89; <sup>m</sup> n=90; <sup>n</sup> n=97; <sup>o</sup> n=64; <sup>p</sup> n=77; <sup>q</sup> n=112; <sup>r</sup> n=85; <sup>s</sup> n=103; <sup>t</sup> n=135.

## CHAPTER 3- RESULTS

### Hypothesis 1: Effects of Duration of Preschool Program Participation

**Data analysis plan.** All three hypotheses were tested using multilevel models (MLM) to compare matched samples of parents whose children were enrolled for one (at age 4) or two years (at age 3) of the preschool program. SAS PROC MIXED was used to model the outcomes. The model accounts for nesting within the first year of the preschool program (Singer, 1998). ICC's for parent measures were as follows: Four outcomes had ICCs of 3% between classrooms. However, higher ICCs of 7% for fall talking activities and 10% for fall book reading justify the use of MLM for the nesting of classrooms. Multiple Imputation (MI) with forty imputed datasets was used with PROC MIANALYZE. Each model used the same predictors for all outcome variables and included a dummy code for years in program (1=entered at age 3 years). The other covariates in the model included: child's gender, child's race (1=black), dummy codes for parental education (i.e., less than high school, more than high school, the reference group is a high school education), primary caregiver relationship to child (1=Mother), primary language at home (1=English), eligibility for enrollment into Head Start, barriers to involvement (work and lack of child care), and the propensity score. Covariates that were continuous scores were grand mean-centered while categorical variables were dummy coded. Mean effect sizes for differences between the two groups were calculated using adjusted means. Table 4 summarizes effects for age of entrance in the program.

**Effects on parent involvement: Fall age 4 assessment (H1a).** Estimated means and effect sizes are presented in Table 4. It was expected that parents who enrolled their child for at age 3 and attended two years would have higher scores on parent-reported emergent literacy practices at home and frequency of library visits compared with parents who enrolled their child at age 4 and attended only one year. This hypothesis was partially supported. One of the five outcomes yielded significant differences: age 4 Talking Activities were significantly higher for parents who enrolled their child at age 3 vs age 4 ( $d = .31, p <$

.05). The difference in number of books and frequency of book reading approached significance ( $d = .25$ ,  $p < .10$ ).

***Effects on parent involvement: summer assessment (H1b).*** It was expected that parents who enrolled their child for 2 years of the preschool program at age 3 would have higher scores on parent-reported emergent literacy practices at home and on teacher reports of at-school participation, quality of parent-teacher relationship, and encouragement of education compared to parents who enrolled their child for 1 year of the preschool program at age 4. This hypothesis was also partially supported. For parent home involvement, three of the four outcomes yielded significant differences: parents who enrolled their child at age 3 read to their child more (# books and frequency composite;  $d = .46$ ,  $p < .05$ ), engaged in more Talking Activities ( $d = .26$ ,  $p < .05$ ), and took their child to the library more often ( $d = .51$ ,  $p < .05$ ) compared to parents who enrolled for one year. For age 4 parent summer at-school activities there was a trend difference approaching significance for “Showing up” activities: Parents who enrolled their children for two years participated in more “showing-up” type of activities as reported for the second year compared to parents who enrolled their children for one year ( $d = .12$ ,  $p < .10$ ). Preschool teacher ratings of parent involvement were not significantly different by age of enrollment.

***Effects on parent involvement: Kindergarten teacher assessment (H1c).*** It was expected that parents who enrolled their children for 2 years beginning at age 3 would have higher ratings on the kindergarten teacher assessments on the quality of parent-teacher relationship and teacher perception of parental encouragement of education compared to parents who enrolled their children at age 4. This hypothesis was also partially supported. Kindergarten teachers rated a higher quality relationship with parents who enrolled their children for two years of the preschool program compared to parents who enrolled their children for one year ( $d = .26$ ,  $p < .05$ ).

Figure 1. Hypothesis 1 Testing Age 4 Parent and Teacher Ratings

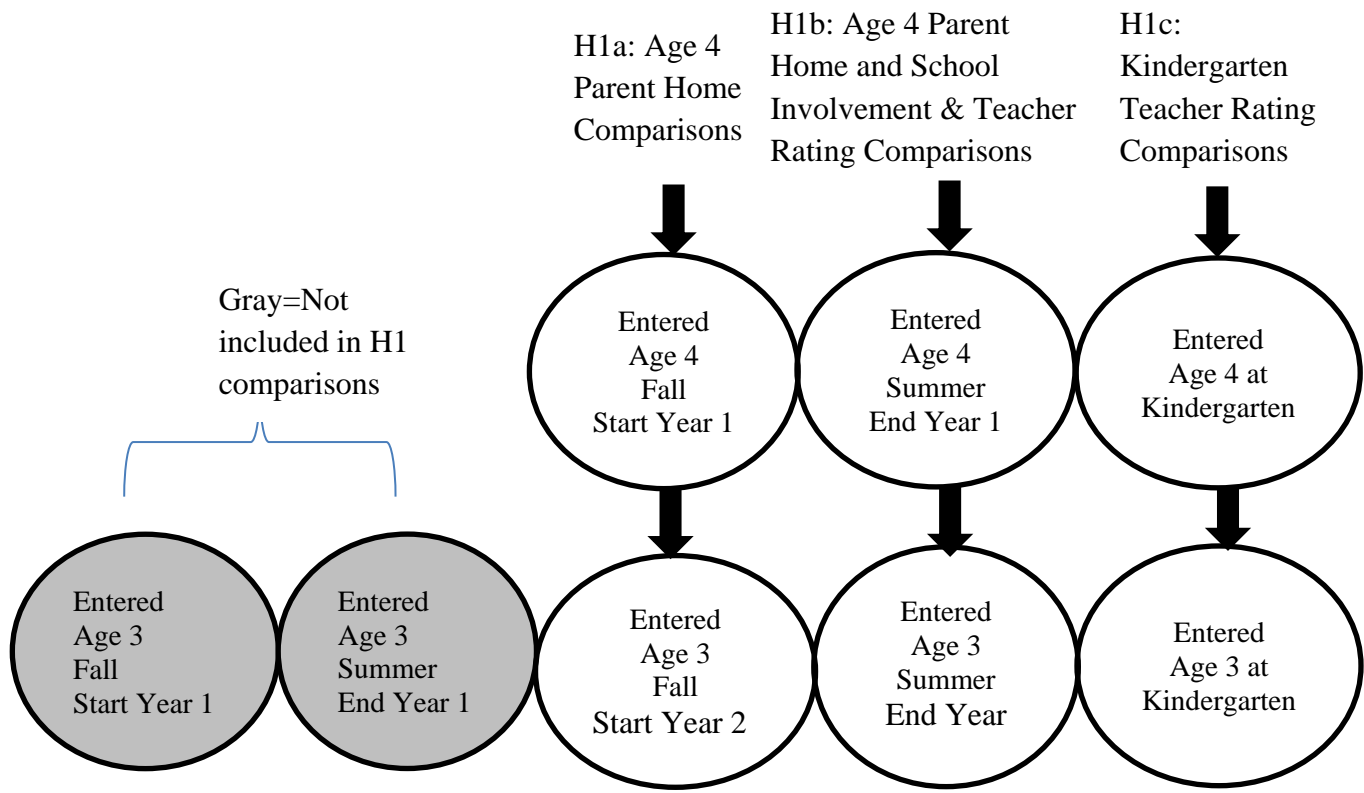


Table 4

Duration of preschool participation and parent involvement (Hypothesis 1): LS Means and Effect Size

Dependent Variables	2 Years (Enter Age 3) LS Means	1 Year (Enter Age 4) LS Means	Effect Size
<b>H1a: Fall Parent Home Involvement</b>			
Literacy Items in the Home	5.99 (2.01)	5.60 (2.01)	0.20
Fall Book Reading to Child (# Books/ Freq)	2.37 (1.14)	2.09 (1.16)	0.25 <sup>+</sup>
Fall Book Reading to Child (# Minutes)	4.76 (1.53)	4.67 (1.53)	0.06
Fall Talking Activities with Child	10.27 (2.37)	9.53 (2.41)	0.31 <sup>*</sup>
Fall Visits to the Library	0.46 (0.68)	0.38 (0.68)	0.12
<b>H1b: Parent Summer Home Involvement</b>			
Summer Book Reading to Child (# Books/ Freq)	2.70 (1.08)	2.21 (1.08)	0.46 <sup>*</sup>
Summer Book Reading to Child (# Minutes)	4.36 (1.56)	4.54 (1.57)	-0.12
Summer Talking Activities with Child	9.37 (2.40)	8.74 (2.42)	0.26 <sup>*</sup>
Summer Visits to the Library	0.76 (0.71)	0.40 (0.71)	0.51 <sup>*</sup>
<b>H1b: Parent School Involvement</b>			
Showing-up Activities (Volunteer in Classroom, Field Trips, School-Wide Events)	3.69 (3.71)	3.26 (3.72)	0.12 <sup>+</sup>
Learning Activities (Home Visits, Parent Meetings)	3.61 (2.41)	3.47 (2.42)	0.06
<b>H1b: Preschool Teacher Ratings of Parent Involvement</b>			
Parent Encourages Education	2.63 (1.05)	2.58 (1.06)	0.05
Teacher-Parent Relationship	2.86 (0.98)	2.93 (0.98)	-0.07
<b>H1c: Kindergarten Teacher Ratings of Parent Involvement</b>			
Parent Encourages Education	2.58 (1.33)	2.64 (1.33)	-0.04
Teacher-Parent Relationship	2.82 (1.01)	2.56 (1.02)	0.26 <sup>*</sup>

Note. Other covariates in the model included child's gender, child's race (1=black), dummy codes for parental education (i.e., less than high school, more than high school, the reference group is a high school education), primary caregiver relationship to child (1=Mother), primary language at home (1=English), eligibility for enrollment into Head Start, barriers to involvement (work and lack of child care), and the propensity score

## **Hypothesis 2: Effects of Parent Teacher Interaction Quality on Parental Involvement**

**Data analysis plan.** Hypothesis 2 was tested using 3-level multilevel models (MLM) with time nested within children and children nested by classroom. Random intercepts with fixed slopes were estimated. Time was included in the model to estimate change in parent involvement from age 3 to age 4. SAS PROC MIXED was used to model the outcomes at the age 4 fall and summer assessment. Multiple Imputation (MI) with forty imputed datasets was used with PROC MIANALYZE. Main effects of time indicate developmental changes in levels of parent involvement. Main effects of parent teacher interaction quality indicate overall differences in parent involvement. The key effect for hypothesis testing is the interaction of time by parent teacher interaction, which tests whether age 3 to age 4 changes in involvement differed as a function of parent-teacher interaction quality. The other covariates in the model included: child's gender, child's race (1=black), dummy codes for parental education (i.e., less than high school, more than high school, the reference group is a high school education), primary caregiver relationship to child (1=Mother), primary language at home (1=English), eligibility for enrollment into Head Start, and barriers to involvement (work and lack of child care).

*Effects of teacher-parent relationship on changes in parent involvement (H2a).* Results for hypothesis 2 are presented in Table 5. Several main effects for time emerged, indicating that parents increased from fall to fall in the amount of talking activities, and from summer to summer in the number of minutes read to their child ( $p < .05$ ) and in visits to the library ( $p < .10$ ). However, there was only one significant interaction effect between time and the teacher parent relationship: Parents who had a positive relationship with their child's teacher in year 1 made larger increases in fall trips to the library in year 2 ( $b = .21, p < .05$ ). There were no significant interactions between time and quality of the parent-teacher relationship in the summer assessments.

*Moderator affects of parent education (H2b).* Hypothesis 2b proposed that the preschool program would improve home involvement most for parents with less than a high school education. This hypothesis was not supported. Low parental education (i.e., less than high school) did not interact with time to predict more at-home or at-school involvement. Overall,

parents with less than a high school education were less likely to participate in reading and talking activities.

Figure 2. Hypothesis 2 Diagram of Comparisons

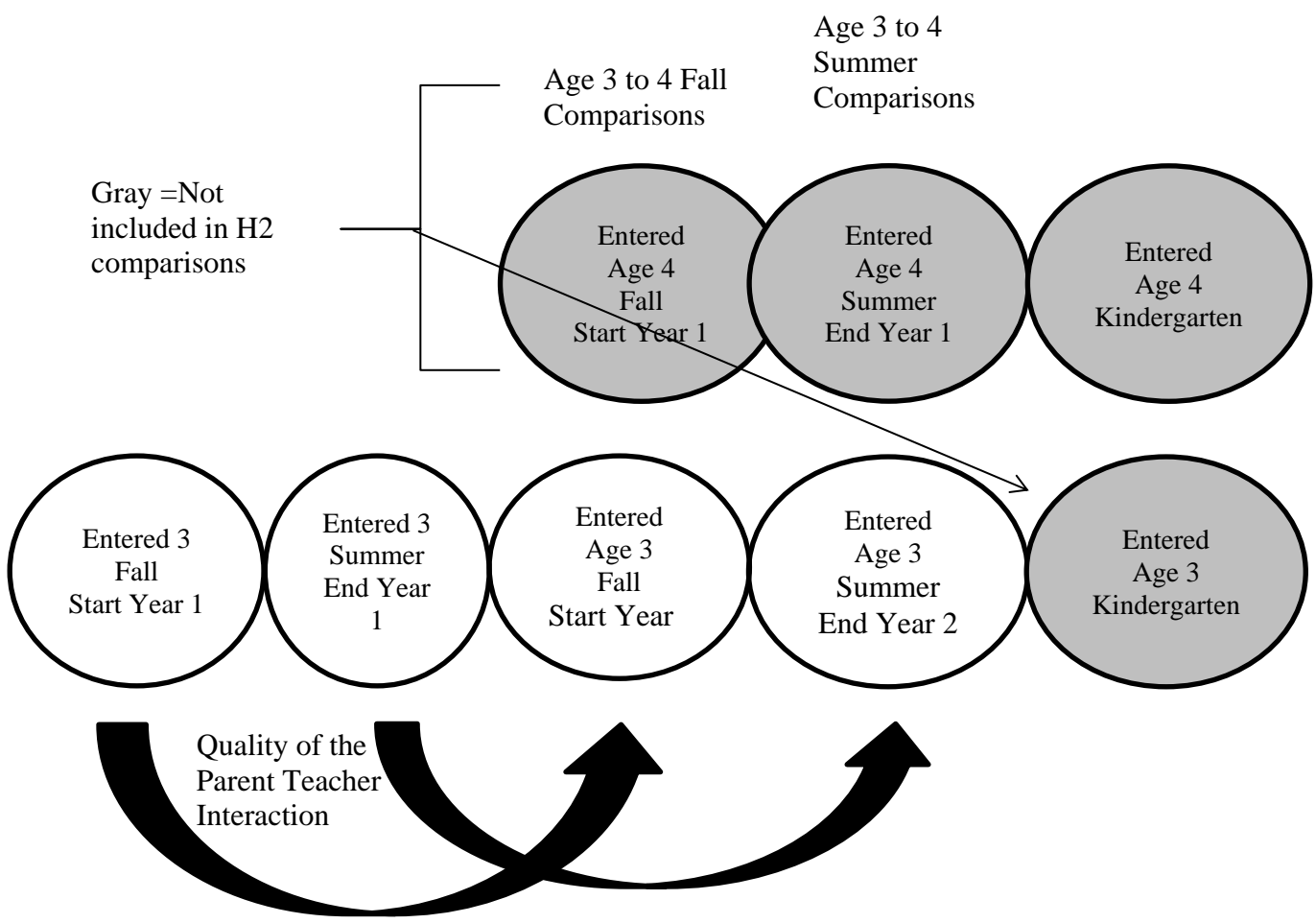


Table 5

## Hypothesis 2: Results for the Quality of the Parent Teacher Interaction

	Year 1		
	Teacher- Parent Relationship	Time	Time* Rel
Parent Home Involvement			
Fall to Fall Number of Literacy Items in the Home	0.03 (0.15)	0.08 (0.22)	Ns
Fall to Fall Book Reading to Child (# Books/ Freq)	0.01 (0.09)	-0.11 (0.12)	Ns
Fall to Fall Talking Activities with Child	0.16 (0.15)	0.44 (0.25) <sup>+</sup>	Ns
Fall to Fall Visits to Library	-0.01 (0.05)	0.12 (0.08)	
	0.09 (0.07)	-0.51 (0.28)	0.21 (0.09) <sup>*</sup>
Sum to Sum Book Reading to Child (# Books/ Freq)	0.14 (0.10)	0.07 (0.14)	Ns
Sum to Sum Book Reading to Child (# Minutes)	-0.13 (0.14)	0.48 (0.21) <sup>*</sup>	Ns
Sum to Sum Talking Activities	0.15 (0.24)	0.13 (0.30)	Ns
Sum to Sum Visits to Library	0.03 (0.07)	0.21 (0.12) <sup>+</sup>	Ns
Parent School Involvement			
Summer to Summer Showing Up (Volunteering in Class, on Field Trips, School Wide Events)	0.73 (0.32) <sup>*</sup>	0.76 (0.51)	Ns
Summer to Summer Learning (home visits, parent meetings)	0.16 (0.21)	0.25 (0.32)	Ns

Note: <sup>+</sup>  $p < .10$ ; <sup>\*</sup>  $p < .05$ ; Sum=Summer; Rel=Relationship; Freq=frequency. Other covariates in the model included child's gender, child's race (1=black), dummy codes for parental education (i.e., less than high school, more than high school, the reference group is a high school education), primary caregiver relationship to child (1=Mother), primary language at home (1=English), eligibility for enrollment into Head Start, and barriers to involvement (work and lack of child care).



### **Hypothesis 3: Parent Involvement and Children’s Emergent Literacy Skills**

**Data analysis plan.** Figure 3 illustrates the timing of comparisons designed to clarify how parent home involvement, school involvement, and parent-teacher communication relate to the development of children’s emergent literacy skills in Kindergarten. For parsimony of testing, a composite of fall and summer for each parent involvement activity was created. Hypothesis 3 was tested using a multi-level models (MLM), nested by classroom. Random intercepts with fixed slopes were estimated. SAS PROC MIXED was used to model the outcomes at the Kindergarten child assessment. Multiple Imputation (MI) with forty imputed datasets was used with PROC MIANALYZE. For each emergent literacy outcome variable, a sequence of models were tested to clarify the unique contributions of the parent involvement predictors. First, the Controls Model included only background control variables. Next, Models 3a, 3b and 3c added the sets of home involvement, school involvement, and teacher-report predictors. Finally, the Full Model included the control variables plus all three sets of parent involvement predictors. The covariates are the same for each child emergent literacy outcome. Results for hypothesis 3 are presented in Tables 6-8.

*Effects of duration of preschool program participation.* Domitrovich, Morgan, Moore, Rhoades, et. al., (2013) have published on the benefits of two years of the intervention entering at age 3 (compared to entering at age 4) and thus having two years vs. one year of the program. These results focused on child outcomes without considering the contributions of parent involvement predictors. Overall, results indicate improvements for children receiving two years; the average effect size for these child outcome measures was .53 for receptive vocabulary (PPVT), .39 for early letter word identification (WJ Letter Word ID) and .17 for early writing (WJ Dictation). Those results are not repeated within this section but are reflected in the significant effects for “2 Years of Program” in the Control variables section of each model.

*Effects of print and reading activities versus oral language activities (H3a).* It was expected that more parent activities that involve print and reading (e.g., library, book reading) would be most strongly associated with print skills (decoding & letter knowledge, writing) whereas activities oriented around oral language activities (e.g., singing, storytelling) would be most strongly associated with vocabulary. This hypothesis was partially supported. The unique

tests are found in Model 3a. As hypothesized talking activities predicted higher receptive vocabulary in Kindergarten (Table 6,  $b = .82$ ,  $p < .05$ ); whereas duration of book reading (# minutes) predicted early writing skills (Table 8,  $b = 1.86$ ,  $p < .05$ ). However, there was no association between home involvement and early decoding & letter knowledge skills. In the full parent involvement model (Full Model), the effects for Talking Activities and duration of book reading remained significant for receptive vocabulary and early writing, respectively. In addition, visits to the library emerged as a significant predictor of decoding & letter knowledge skills (Table 7).

*Effects of activities involving proximal adult child interactions (H3b).* It was expected that at-school parenting practices in which proximal adult-child interactions occur (i.e., showing up—volunteering, field trips, attending school wide activities) would be more strongly associated with emergent literacy skills than parent involvement in which no direct parent-child interactions occur (i.e., learning opportunities—home visits, parent meetings). This hypothesis received limited support. Showing Up activities at school approached significance in predicting receptive vocabulary (Model 3a,  $b = .39$ ,  $p < .10$ ; Full Model,  $b = .42$ ,  $p < .10$ ) but did not predict decoding & letter knowledge or writing skills. Involvement in learning opportunities did not predict any of the three emergent literacy outcomes.

*Effects of teachers perceptions of parent encouragement of education (H3c).* It was expected that teacher's perceptions of parents' encouragement of education would predict higher receptive vocabulary scores and other emergent literacy skills. This hypothesis was not supported. Teacher reports of parents' encouragement of education did not predict any of the three emergent literacy outcomes.

Figure 3. Hypothesis 3 Diagram of Comparisons

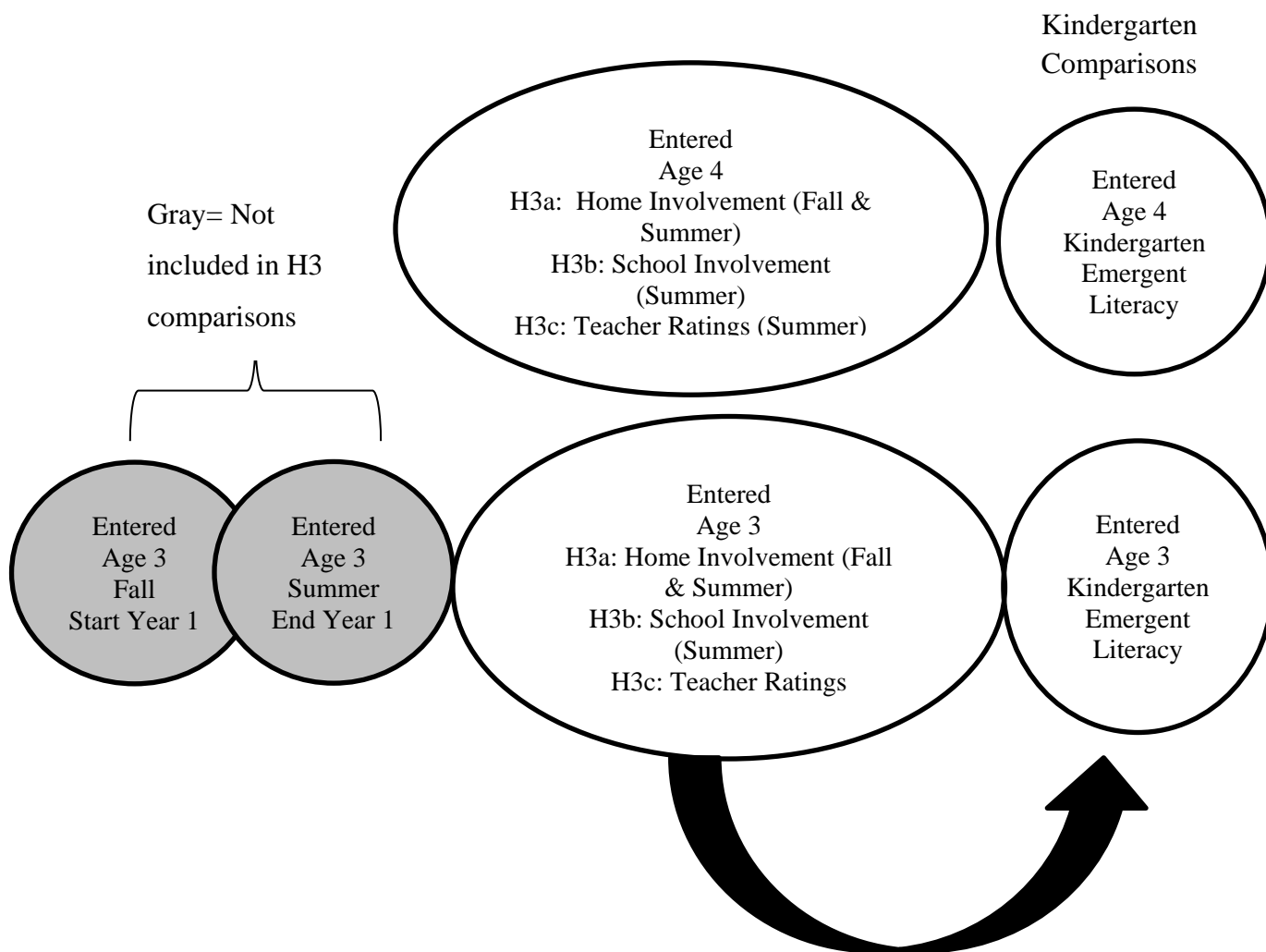


Table 6  
Parent Involvement Predicting Kindergarten Receptive Vocabulary Skills (PPVT)

	Controls Model Est. (SE)	Model 3a Home Involvement Est. (SE)	Model 3b School Involvement Est. (SE)	Model 3c Teacher Perceptions Est. (SE)	Full Model Est. (SE)
Intercept	81.26 (4.72) ***	72.64 (6.47) ***	82.42 (4.77) ***	81.39 (5.27) ***	76.11 (6.83) ***
Controls					
Female Gender	-1.77 (1.35)	-1.88 (1.34)	-2.02 (1.38)	-1.78 (1.35)	-2.19 (1.37)
Black Race	0.52 (1.70)	0.75 (1.71)	0.99 (1.75)	0.52 (1.70)	1.28 (1.77)
Parent Education- English	0.58 (0.91)	0.31 (0.90)	0.55 (0.93)	0.59 (0.94)	0.39 (0.94)
Mother	6.75 (3.37) ***	7.17 (3.37) *	6.41 (3.38)+	6.70 (3.45)+	6.54 (3.43)+
Head Start Eligible	2.94 (3.41)	3.83 (3.41)	1.93 (3.39)	3.02 (3.45)	2.78 (3.42)
Pretest Receptive Vocab	-4.42 (1.83) *	-4.99 (1.85) **	-4.48 (1.85) *	-4.44 (1.83) *	-5.16 (1.84) *
Propensity Score	0.51 (0.05) ***	0.51 (0.05) ***	0.50 (0.05) ***	0.51 (0.05) ***	0.50 (0.05) ***
2 Years of Program	-20.28 (6.75) **	-21.68 (6.84) **	-21.00 (6.81) **	-20.26 (6.79) **	-21.73 (6.87) **
	5.55 (1.33) **	4.70 (1.39) **	5.05 (1.37) **	5.53 (1.34) **	4.12 (1.45) **
H3a: Parent Home Involvement					
Number of Literacy Items in the Home		-0.31 (0.48)			-0.45 (0.46)
Book Reading to Child (# of minutes)		0.37 (0.53)			0.25 (0.54)
Talking Activities with Child		<b>0.82 (0.41) *</b>			<b>0.90 (0.41)*</b>
Visits to Library		1.24 (1.34)			1.10 (1.34)
H3b: Parent School Involvement					
Showing-up (Volunteering in Class, on Field Trips, School Wide Events)			<b>0.39 (0.22)+</b>		<b>0.42 (0.22)+</b>
Learning (home visits, parent meetings)			-0.33 (0.41)		-0.43 (0.40)
H3c: Teacher Perceptions of Involvement					
Teacher Report Parent Enc Education				-0.06 (0.76)	-0.47 (0.75)

Note. Est. = Estimate; SE=Standard Error. \*  $p < .05$ . \*\*  $p < .01$ , \*\*\*  $p < .001$

English=Primary Language is English; Mother=Primary Caregiver is Mother; Enc= Encourages;

Table 7  
Parent Involvement Predicting Kindergarten Decoding & Letter Knowledge Skills (WJ-LW ID)

	Controls Model Est. (SE)	Model 3a Home Involvement Est. (SE)	Model 3b School Involvement Est. (SE)	Model 3c Teacher Perceptions Est. (SE)	Full Model Est. (SE)
Intercept	94.79 (6.67) ***	88.39 (9.17) ***	95.79 (6.82) ***	93.94 (7.14) ***	88.79 (9.74) ***
Controls					
Female Gender	<b>4.48 (1.76) *</b>	<b>4.30 (1.74) *</b>	<b>4.30 (1.79) *</b>	<b>4.50 (1.76) *</b>	<b>4.11 (1.77) *</b>
Black Race	3.39 (2.15)	3.64 (2.11)+	3.50 (2.19)	3.38 (2.16)	3.69 (2.16)
Parent Education- English	2.01 (1.16)+	1.86 (1.15)	2.09 (1.18)+	1.95 (1.18)+	1.98 (1.18)+
Mother	-3.25 (4.62)	-3.08 (4.75)	-3.24 (4.66)	-3.10 (4.66)	-2.93 (4.83)
Mother	-5.92 (4.67)	-4.91 (4.87)	-6.28 (4.77)	-5.97 (4.67)	-5.09 (4.96)
Head Start Eligible	-2.04 (2.41)	-2.20 (2.46)	-1.85 (2.48)	-1.98 (2.41)	-1.81 (2.53)
Pretest Receptive Vocab	0.12 (0.07)+	0.11 (0.07)	0.11 (0.07)	0.11 (0.07)	0.09 (0.07)
Propensity Score	-3.30 (9.44)	-4.97 (9.84)	-2.59 (9.49)	-3.47 (9.50)	-4.11 (9.89)
2 Years of Program	<b>4.80 (1.81) **</b>	<b>4.24 (1.85) *</b>	<b>4.73 (1.85) *</b>	<b>4.80 (1.81) *</b>	<b>4.23 (1.89) *</b>
H3a: Parent Home Involvement					
Number of Literacy Items in the Home		-0.03 (0.64)			0.01 (0.67)
Book Reading to Child (# of minutes)		0.62 (0.72)			0.59 (0.71)
Talking Activities		0.20 (0.54)			0.19 (0.55)
Visits to Library		2.49 (1.66)			<b>2.81 (1.72)<sup>p=.10</sup></b>
H3b: Parent School Involvement					
Showing-up (Volunteering in Class, on Field Trips, School Wide Events)			0.01 (0.26)		-0.09 (0.29)
Learning (home visits, parent meetings)			-0.27 (0.48)		-0.35 (0.47)
H3c: Teacher Perceptions of Involvement					
Teacher Report Parent Enc Education				0.30 (0.91)	0.20 (0.93)

Note. Est. = Estimate; SE=Standard Error. \*  $p < .05$ . \*\*  $p < .01$ , \*\*\*  $p < .001$

English=Primary Language is English; Mother=Primary Caregiver is Mother; Enc= Encourages;

Table 8  
Parent Involvement Predicting Kindergarten Early Writing Skills

	Controls Model Est. (SE)	Model 3a Home Involvement Est. (SE)	Model 3b School Involvement Est. (SE)	Model 3c Teacher Perceptions Est. (SE)	Full Model Est. (SE)
Intercept	99.12 (8.38) ***	82.50 (11.32) ***	101.78 (8.51) ***	94.25 (9.21) ***	81.37 (12.22) ***
Controls					
Female Gender	4.90 (2.28) *	4.46 (2.21) *	4.40 (2.31)+	5.00 (2.27) *	4.17 (2.22)+
Black Race	3.09 (2.74)	3.39 (2.75)	3.79 (2.77)	3.00 (2.75)	3.86 (2.82)
Parent Education- English	1.49 (1.46)	1.20 (1.46)	1.59 (1.47)	1.17 (1.48)	1.07 (1.48)
Mother	-10.33 (5.90)+	-9.08 (6.03)	-10.62 (6.05)+	-9.39 (6.06)	-8.43 (6.33)
Head Start Eligible	-1.01 (6.24)	-0.55 (6.38)	-2.76 (6.28)	-1.46 (6.22)	-2.50 (6.50)
Pretest Receptive Vocab	-5.38 (3.01)+	-5.46 (3.03)+	-5.18 (3.08)+	-5.05 (3.00)+	-4.91 (3.07)
Propensity Score	<b>0.30 (0.09) *</b>	<b>0.28 (0.09) **</b>	<b>0.27 (0.09) **</b>	<b>0.27 (0.09) *</b>	<b>0.24 (0.09) *</b>
2 Years of Program	-9.51 (11.41)	-11.71 (11.62)	-9.37 (11.40)	-10.65 (11.45)	-11.85 (11.56)
	2.30 (2.25)	1.76 (2.30)	1.63 (2.37)	2.36 (2.24)	1.37 (2.37)
H3a: Parent Home Involvement					
Number of Books in the Home		0.59 (0.73)			0.49 (0.75)
Book Reading to Child (# of minutes)		<b>1.86 (0.88) *</b>			<b>1.87 (0.89) *</b>
Talking Activities		0.34 (0.66)			0.32 (0.65)
Visits to Library		1.01 (2.27)			0.93 (2.36)
H3b: Parent School Involvement					
School Involvement Showing-up			0.50 (0.34)		0.31 (0.38)
School Involvement Learning			-0.79 (0.63)		-0.65 (0.62)
H3c: Teacher Perceptions of Involvement					
Teacher Report Parent Enc Education				1.74 (1.27)	1.52 (1.25)

Note. Est. = Estimate; SE=Standard Error. \*  $p < .05$ . \*\*  $p < .01$ , \*\*\*  $p < .001$

English=Primary Language is English; Mother=Primary Caregiver is Mother; Enc= Encourages;

Table 9  
Correlations among Predictors

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
A Female	1.00																		
B Black	-.06	1.00																	
C PCED	.02	.01	1.00																
D English	.02	.43*	.02	1.00															
E Mother	.06	.06	-.03	.05	1.00														
F HS Elig	.02	.18**	-.27*	.09	.00	1.00													
G Pre Voc	.13*	.07	.19**	.22**	-.03	-.21*	1.00												
H Prop	-.15*	.06	.08	.26**	.31**	-.38*	.10	1.00											
I 2 Years	-.02	-.02	.06	.03	-.05	-.12*	.06	.13*	1.00										
J Lit items	.01	.13*	.10	.05	-.06	-.03	.03	.09	.00	1.00									
K #/ Freq	.14*	-.06	-.04	.02	.15*	.01	.03	.04	.18**	.27**	1.00								
L # min	.10	-.14*	.07	-.11	.09	-.11	.06	-.02	.03	.07	.22**	1.00							
M Talk Act	-.05	.02	.11	-.03	-.05	.03	-.04	.06	.16*	.33*	.26**	.07	1.00						
N Library	-.03	-.01	.09	.04	-.02	-.08	.09	.08	.13*	.12	.14*	.10	.17**	1.00					
O Par Show up	.03	-.07	.15*	.05	.03	.00	.10	.05	.17*	.09	.25**	.07	.10	.22**	1.00				
P Par Learning	-.18*	.09	.04	.01	-.15*	.14	-.23*	-.02	-.06	-.01	.08	-.10	.16*	.17*	.19*	1.00			
Q TR Par Enc	-.03	-.07	.22**	-.06	.01	-.21*	.13*	.08	.08	.09	.14*	.01	.12	.11	.11	-.10	1.00		
R TR Rel	-.0	-.10	.10	-.10	.10	-.09	-.01	.06	-.02	.07	.15*	-.05	.06	.01	.10	-.08	.70**	1.00	
S Avg																			
ClassVolunteer	.01	-.08	.03	.00	.02	.10	-.12*	.00	.01	-.09	.05	.03	-.10	.00	.24**	.03	.00	-.05	1

Note: \*  $p < .05$ . \*\*  $p < .01$ , \*\*\*  $p < .001$ ; PCED=Parent Education; English=Primary Language is English; Mother=Primary Caregiver is Mother; HS Elig=Head Start Eligible; Pre Voc=Pre-test receptive Vocabulary; Prop=Propensity Score;; Lit Items=Literacy Items in the home; #/ Freq=Composite- # of books read per week and frequency of reading; # Min= # minutes caregiver read in one sitting; Talk Activities=Sum score of parent-child interactions; Par Show-up=Parent Showing up at School Involvement (Volunteer, Field Trips, School-wide activities); Par Learn=Parent Involved in Learning activities through school (home visits, parent meetings); TR Par Enc=Teacher Ratings of Parent Encourages Education at Home; TR Rel=Teacher Ratings of the relationship with the Parent.

## CHAPTER 4- DISCUSSION

This dissertation addressed three questions about the predictors and consequences of parent involvement during the preschool years. The first question was how the age of entrance and duration of preschool program participation would affect levels of parent involvement. Results partially supported the hypothesis that children who entered at age 3 and thus had two years of program participation would lead to higher parent involvement. The second question was whether parent-teacher interaction quality during the first year of program participation and entered at age 3 would predict increased parent involvement in the second year when their children were age 4. There was no support for this hypothesis, even among parents with less than a high school education. The third question was whether parent involvement predicted growth in children's emergent literacy skills. Results supported the expectation that parent involvement both at home and at school predict growth in children's vocabulary, print skills and early writing skills. Overall, these findings support the view that parent involvement can be improved through preschool programs and can contribute to children's early school success.

### **Age of Entry/Duration of Preschool Participation and Parent Involvement**

Overall, there were significant differences for only one fall home involvement, specifically fall "talking" activities. There were significant differences in the summer assessment for 3 of the 4 home involvement activities. Specifically, reading activities, summer "talking" activities, and summer visits to the library all were significantly higher for parents whose children enrolled 2 years vs. 1 year. There were also differences that were approaching significance. The most noteworthy finding is that "showing up" for at-school activities (i.e., volunteering in the classroom, field trips, and school wide events) was higher for parents (i.e., approaching significance) whose children enrolled for 2 years versus 1 year. These results support the hypothesis that two years of the preschool program benefit parent involvement.



The finding of significant differences in parent involvement during the summer is particularly interesting considering the work of Entwisle & Alexander (1992), who found children living in poverty were more likely to lose important academic skills during the summer months. Although there was an extended summer session of the current preschool program, these results suggest the preschool program may have helped parents to continue to engage in important parenting practices that promote academic skills at home during the summer. These parenting practices can be a buffer for their children's academic skills during school breaks.

Kindergarten teachers rated parents who enrolled their children at age 3 and thus had two years of enriched preschool experience as having a higher quality relationship with them. In these models, parent education was not related to parent report of home or school involvement, but teachers perceived lower educated parents as valuing education less and engaging less often in getting to know the teacher. This contradicts Epstein's (1991) research suggesting teachers who offered more parent involvement practices did not give significantly inferior ratings to single parents or less-educated parents. Although specific teacher practices were not measured, the school environment and curriculum of this preschool program encourages parent involvement. These results suggest that two years of program participation increased Kindergarten teachers' perceptions of the parent-teacher relationship, but the same effect was not obtained with preschool teacher ratings. It would seem likely if parents had two years to participate and get involved then preschool teachers would perceive these changes, especially since the parents themselves reported they were more involved in the second year. More research is needed to understand how to improve the parent-teacher relationship in ways that improve preschool teachers' perceptions. Webster-Stratton's Incredible Years intervention with parents and teachers has shown to be a promising intervention to increase parent-teacher bonding compared to the usual Head Start model. Her program suggests explicit training with both parents and teachers are needed to increase the quality of their relationship.

## **Parent-Teacher Interaction Quality and Changes in Parent Involvement**

Several types of parent involvement increased over time. However, the causes of these increases are unclear and must be interpreted with caution. For example, increases in the duration of book reading may reflect age-related increases in the child's ability to focus for longer periods. A similar explanation may account for increases in talking activities and visits to the library, which approached significance. In the longitudinal comparisons of children who entered preschool at age 3, the majority of parent involvement activities showed a non-significant effect for time (i.e., 2 years of the program), suggesting that parents whose children were enrolled for two years of the preschool program started higher on most parenting practices and maintained those high levels of involvement for the second year of the program. Perhaps when parents enter a supportive preschool program when their child is younger (i.e., needing more support from home) they are able to maintain that level of involvement for the second year of participation. Another possible explanation is that there was change, but the assessments were not spaced close enough or early enough to capture the change in parenting practices. This may be due to the timing of the assessment. The first assessment for parent involvement was in November, three months after the start of the program. In order to test a true change in time, a pre-test assessment before the program started needs to be included into the design of the evaluation.

After time was included in the model, two moderating hypotheses were tested: the effects of the teacher-parent relationship and parent education. There was only one main effect for the quality of the parent-teacher relationship. Higher quality of the teacher-parent relationship in during the first year of preschool (age 3) was positively related to parents attending more activities at the preschool program (i.e. Showing Up involvement). This suggests that parents who had a positive relationship with the teacher in year 1 probably were already "showing up" at school by the end of year 1. Again, more measurement assessments would need to be included in a research design to identify a tipping point, in which quality of the relationship changes parenting behavior or the reverse is true if the parenting behavior of "showing up" more often was related to a better quality relationship with the teacher. These mixed findings suggest more research

is needed to understand the parent-teacher mesosystem within Bronfenbrenner's ecological model, in which the teacher and parent communicate to support the child's education. A comfortable rapport between teachers and parents should have encouraged a dialogue about the best ways to support each child. For example, Webster-Stratton, Reid & Hammond (2001) suggested that parent bonding to and satisfaction with the school are critical components of an effective preschool program. Additionally, the Chicago Parent Child Centers established a clear objective to encourage parents to feel comfortable at the school by creating parent visitation rooms (Reynolds, 2000). The current program also had clear objectives to encourage parent involvement at home and at school. Contrary to expectations, there was not a positive relationship between the quality of the parent-teacher relationship and most parenting practices. Thus, more research is needed to understand the role of the quality of parent-teacher interactions and parents' comfort at school. It may be that the parent-teacher relationship is not related to increased parent involvement, but the present null findings could also reflect measurement limitations. The measurement of the quality of the parent teacher interaction did not include the parents' perceptions of the quality of their interactions with the teacher. Also, additional assessment points could provide greater information on when and how often parents engaged with the teacher at school.

The second moderator tested was lower parental education. It was expected that parents with the lowest education would have the most improvement due to lower social capital (Dearing, 2004; Weiss, et. al., 2005). Additionally, lower educated parents were expected to have a greater willingness to learn ways to support their child's education (Epstein & Dauber, 1991). Finally, it was expected that teachers would make the biggest difference in whether or not parents will be involved in their children's education (Epstein, 1990; Epstein, 1991). Contrary to expectations, teacher ratings of parent involvement did not improve significantly more for those with the lowest education. This is inconsistent with the results obtained by Dearing (2004), whose intervention found mothers with lower education improved their parent involvement the most as a result of the intervention. More systematic preschool prevention research is needed to understand ways to engage parents with the lowest education. Specific features of effective programs need to be disseminated to all programs working with parents with less education.

## **Parent Involvement and Children's Emergent Literacy Skills**

According to Bronfenbrenner's family support hypothesis, one of the most important factors in sustained academic achievement is a family that promotes the child's learning. Hypothesis 3 tested how specific types of home and school involvement predicted children's emergent literacy skills in Kindergarten. Three emergent literacy skills were examined: receptive vocabulary, early letter-word identification, and early writing. Self-report parent-child book reading has limitation of social desirability, nonetheless it was expected that there would be a moderate effect size between the frequency of book reading and receptive vocabulary (Bus, 1995; Whitehurst, & Lonigan, 2002). Contrary to expectation, the frequency of book reading was not related to receptive vocabulary. However, other activities that promoted more talking (i.e., dialogue) were positively related to language skills in Kindergarten. Reynolds (2000) argued for the importance of at-school parent involvement (e.g., volunteering or being more involved in the classroom) because teachers can serve as effective models of ways to engage children in positive interactions and literacy activities. This transmission of learning through modeling was more related to children's language skills compared to home visits or parent meetings, where direct instruction is the mode of learning. The current study supports Reynolds' theory and found that at-school involvement (i.e., showing up at school) also was approaching a significant association with children's receptive language.

Specific parenting practices also emerged as significant predictors of children's early letter word identification and early writing skills: visits to the library were positively related to early letter word identification and book reading for longer durations was positively related to early writing. Therefore, although book reading was not related to receptive vocabulary, it was related to early writing skills. Evaluation of preschool programs should include the specific books parents read with their child that may encourage more understanding of shapes and letters. Understanding print comes from repeated and prolonged exposure. Research on ways parents directly encourage language and emergent literacy skills need to be integrated into existing preschool systems.

## Strengths

This study contributes to the field of parent involvement in several ways. It provides a more detailed examination of emergent literacy skills and the parenting practices that support those skills. Although there have been numerous studies on parent involvement, this study dissects specific components that are thought to be critical to specific emergent literacy skills. For example, other studies have summed a number of home and community based activities into global composite scores (Wen, et al., 2012). The closer examination of specific parenting practices (i.e., book reading, talking, and visits to the library) in the present study resulted in more precise measures that permitted theory guided hypotheses about the value of specific practices. This study also includes a more detailed empirical investigation of at-school involvement. While some researchers include a single item or a sum of all types of school involvement (Clements, Reynolds, & Hickey, 2004; Ou, Mersky, Reynolds, Kohler, 2007; Ou & Reynolds, 2010; Reynolds, 1989; Reynolds, 1991; Reynolds, 1995; Reynolds, Temple & Ou, 2010), this study disentangles specific “showing up” activities that have been shown to relate cross-sectionally to 6<sup>th</sup> grade student academic success (Grolnick & Slowiaczek, 1994). Finally, it evaluates the change in parent involvement within preschool for parents who began participation when their children were either age 3 or age 4. This area of research is needed to understand which areas of parent involvement are potentially malleable and which are most important for children’s emergent literacy skills. Among some of the methodological strengths, the study utilized a matched propensity analysis to help create equivalent group of parents who may be similarly likely to value education and start schooling earlier.

This study provided a relatively comprehensive evaluation of parent involvement during preschool by utilizing both parent and teacher ratings and by drawing upon several prominent theories of parent involvement and models of links between parenting practices and emergent literacy. The definition of parent involvement is consistent with a large number of recent studies that focus on three domains of home, school, and the relationship between the two domains (i.e., meso-system), often referred to as parent-teacher communication (Dearing, 2004; Epstein, 1995; Fantuzzo, 2000; Fantuzzo, 2004;

Fantuzzo, 2013; Gavin, 1998; Izzo, 1999; Kohl, 2000; Mendez, 2010; McWayne, 2004; Powell, Son, File, & San Juan, 2012; Webster-Stratton, 2000). Additionally, this study considers the literature on parent involvement that focuses on specific parenting practices (Eccles & Harold, 1993; Steinberg, 1992; Stone, 2006). Specific practices of book reading and visits to the library are important to consider given the research on parent-child book reading (Bus, et. al., 1995; Scarborough & Dobrich, 1994). For example, the behavior component that Grolnick and Slowiaszek (1994) referred to as showing up was demonstrated to be important in improving children's receptive vocabulary skills. It was expected that parent volunteering would increase children's language skills due to opportunities to observe teachers' positive adult-child interactions (Reynolds, 2000). Including the meso-system of parent-teacher communication (using similar items from Webster Stratton's parents' bonding with teacher) helped to clarify the very few parent involvement practices that were improved. More research is needed in this domain of the quality of teacher-parent interactions. Understanding the determinants and impact of at-school parent involvement is important because it would allow programmatic feedback to Head Start and other public preschool programs, indicating which types of parental involvement are more beneficial for ensuring children's success at school. Future research can evaluate specific school curriculum utilized to increase those practices.

## **Limitations**

There are several limitations worth mentioning. Many studies suggest social desirability may influence parent's ratings of their book reading activities (Bus, 1995). Social desirability may also influence parent reports of volunteering and attendance at school events. A preferable approach would be to use measures that are robust to social desirability, such as book reading logs, attendance records of at-school involvement and the author checklist (Sénéchal, LeFevre, Hudson & Lawson, 1996), in which parents identify well-known children's book authors or book titles, and corrects for guessing. Although it was expected more frequent book reading would be positively related to receptive vocabulary, this study was limited in the measurement of book reading. Gest et al., (2007) suggested that shared book reading was related to children's comprehension skills (i.e., expressive vocabulary, grammatical understanding) especially among parents

who used less directive and more verbal elaboration and give-and-take. This study suggested the quality of the book reading activity is important to consider when examining the benefits of children's language skills as improving through parent-child interactions.

The propensity calculation may have missed some important unknown or unmeasured variables that contribute to explaining the outcome variable. Despite success in making groups equivalent (i.e., propensity score matching), there may be unmeasured differences that make involvement for parents whose children enrolled for 2 years of the program initially higher. The quasi-experimental design did not include a true control group that would help us understand how child-initiated demands more from his/her parent. For example, as the child develops attention skills and is able to sit for longer periods, the child may demand more time from the parent in book reading. Contrarily, responsive parents may understand the changes in child's attention, and select longer books and continue book reading sessions, so with practice and exposure children sit for longer and longer periods. In terms of the evaluation of the program, since parent involvement did not change for the group of parents most at risk for non-involvement (i.e., parents with less than a high school education), more research is needed to identify strategies to get those parents into the classroom and to feel more comfortable to engage in the classroom and with their child at home.

## **Future Directions**

Findings from this study should be used to help improve parent involvement programs in public preschools. Specifically, at-school parent involvement was identified to be most likely to change from when the child is age 3 to age 4 and also related to receptive vocabulary. Book reading also was identified as an important component of home parent involvement. Future studies should employ randomized control designs that focus on strategies to promote specific home and school involvement strategies. Home visits are a unique component of the Head Start model. The philosophy of school personnel going to the home, meeting the parent on his/her turf was hoped to empower parents. However, empirically validated practices to teach parents are not included in

most Head Start home visiting models. Recent interventions have attempted to remedy that concern. For example, Welsh, Bierman and Mathis (2013) discuss the importance of home visits and providing empirically validated curricula to utilize that time more wisely. A program developed called REDI, included intensive use of home visits to increase parent-child interactions. This type of intervention evaluation is promising to help parents support their child's education. Most importantly, the family support hypothesis is worth the investment. Families will continue to support their child's education long after a preschool intervention is complete (Bronfenbrenner, 1975). This is especially true for low income families who can benefit from efforts to enhance this support and access to resources (McQuillan, 1998).

Henrich (2013) discusses a variety of strategies to improve teacher-parent communication. Utilization of text messages and cell phone use, in addition to teacher training of using the Family Map Inventory seemed to improve the quality of teacher-parent communication. More research is needed to disseminate such effective strategies to current programs and to provide additional training to parents and teachers on effective strategies (Webster-Stratton, 2000). Additionally, although there was a main effect for specific types of parent involvement improving children's Kindergarten readiness skills, the public preschool intervention was not especially effective in improving parent involvement for those with the lowest education. Parents with less than a high school education theoretically had the most room to improve. Interventions need to be designed specifically to support those parents. Programs need to encourage attendance of parents with lower educational attainment at school events, and improving interactions that are specific to children's school performance.

More systematic research on preschool participation, parent involvement and children's emergent literacy development is required to determine the most effective strategies to promote effective parenting practices both at home and at school. The current study provides some promising evidence on these topics that warrants further examination.



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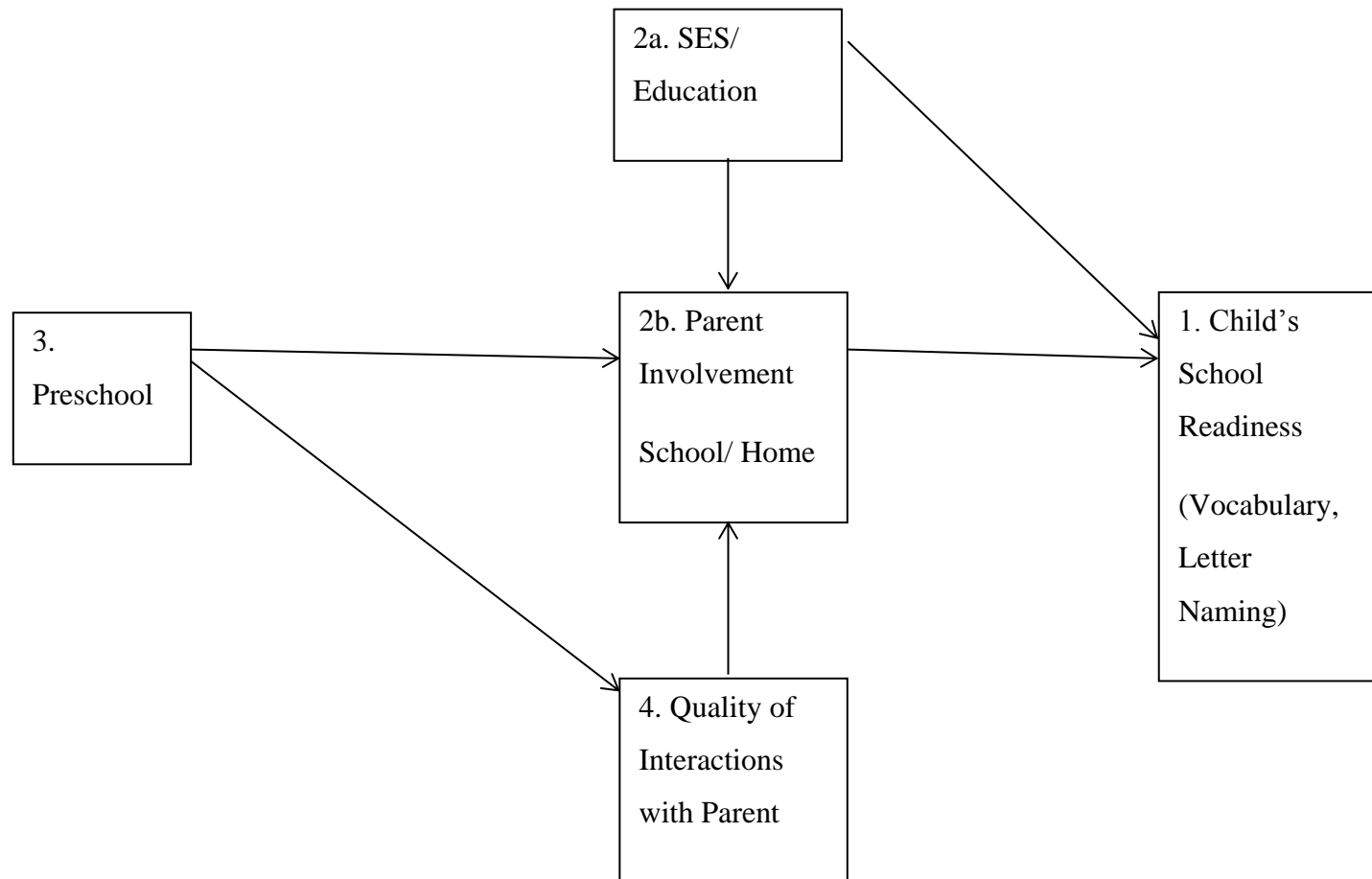
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**APPENDIX A**

## Model of Parent Involvement



## APPENDIX B- Deviance Tests

### Hypothesis 1

	AIC Empty Model	AIC with Predictors
<b>H1a: Fall Parent Home Involvement</b>		
Literacy Items in the Home	1240.3	1209.0
Fall Book Reading to Child (# Books/ Freq)	828.7	820.0
Fall Book Reading to Child (# Minutes)	1095.6	1055.7
Fall Talking Activities with Child	1246.5	1228.4
Fall Visits to the Library	582.4	580.5
<b>H1b: Parent Summer Home Involvement</b>		
Summer Book Reading to Child (# Books/ Freq)	881.6	862.9
Summer Book Reading to Child (# Minutes)	1036.2	1030.2
Summer Talking Activities with Child	1315.6	1286.3
Summer Visits to the Library	638.0	631.5
<b>H1b: Parent School Involvement</b>		
Showing-up Activities (Volunteer in Classroom, Field Trips, School-Wide Events)	1585.4	1539.5
Learning Activities (Home Visits, Parent Meetings)	1340.6	1302.9
<b>H1b: Preschool Teacher Ratings of Parent Involvement</b>		
Overall Parent-Teacher Involvement	559.5	560.1
Parent Encourages Education	835.5	824.9
Teacher-Parent Relationship	801.2	791.9
<b>H1c: Kindergarten Teacher Ratings of Parent Involvement</b>		
Overall Parent-Teacher Involvement	763.3	761.8
Parent Encourages Education	981.0	956.0
Teacher-Parent Relationship	838.3	802.5

## Hypothesis 2

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	AIC Empty Model	AIC with Predictors
<hr/>		
H2a: Fall Parent Home Involvement		
Literacy Items in the Home	1178	1165
Fall Book Reading to Child (# Books/ Freq)	839.5	828.5
Fall Talking Activities with Child	1214.7	1190.4
Fall Visits to the Library	545.8	563.5
H1b: Parent Summer Home Involvement		
Summer Book Reading to Child (# Books/ Freq)	819.5	814.5
Summer Talking Activities with Child	1228	1189
Summer Visits to the Library	701	693.6
H1b: Parent School Involvement		
Showing-up Activities (Volunteer in Classroom, Field Trips, School-Wide Events)	1246.2	1228.2
Learning Activities (Home Visits, Parent Meetings)	1576.1	1511.9

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### Hypothesis 3

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	AIC	
	Empty Model	AIC with Predictors
Receptive Vocabulary	2310	2088
Kindergarten Print Skills	2308	2219
Kindergarten Early Writing Skills	2445	2337

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