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MULTIPLE PATHS TO FIRST GRADE: A COMPARISON OF CHILD,

PARENT, AND EARLY EDUCATION VARIABLES ASSOCIATED WITH

MULTIPLE YEAR KINDERGARTEN EXPERIENCES

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MULTIPLE PATHS TO FIRST GRADE: A COMPARISON OF CHILD, PARENT,
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KINDERGARTEN EXPERIENCES

A dissertation submitted to the Division of Graduate Studies
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ABSTRACT

This study explored the predictors of multiple year kindergarten experiences. Using the Early Childhood Longitudinal Study–Kindergarten data, the study examined whether child and family variables predicted who would receive more than one year of kindergarten. Data for 15,936 kindergarten students were analyzed. A backward Multiple Logistic analysis was conducted. Strong predictive relationships were found for gender and disability status. Boys and children with disabilities were found significantly more likely than girls and children without disabilities. Non-two parent families strongly predicted multiple year experiences. Mothers’ expectations for academic achievement and mothers’ age at first birth were strongly predictive. Whether children entered kindergarten on time or not was strongly predictive. And, the child’s reading assessment score was found to be strongly predictive of multiple year kindergarten experiences.

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CHAPTER 1

INTRODUCTION

Over the past several decades, research on school readiness has revealed one finding upon which most agree—the first years of school play a seminal role in shaping the trajectory of achievement and success for young school children (Boyer, 1991; Pianta, 1999; Shonkoff & Phillips, 2000a; Shonkoff & Phillips, 2000b). The types of learning experiences children receive in the first few years of school have been found to influence and predict later academic outcomes (Dearing, Kreider, Simpkins, & Weiss, 2006; Entwisle, 1988; Gill & Reynolds, 1999; Jimerson, Carlson, Rotert, Egeland, & Stroufe, 1997; Luster & McAdoo, 1996; Stearns, Moller, Blau, & Potochnick, 2007; Stipek, 2004). Additionally, many believe that not only are academic experiences in later grades impacted, but specific later social outcomes such as income, job retention and rates of incarceration are related to early school experiences (Ferguson, Jimerson, & Dalton, 2001; Fine & Davis, 2003; Jimerson, 2004; Powell, 2006; Ramey & Ramey, 1999). Decisions about the type and timing of early experiences children receive have a considerable impact on later success.

Experiences in the early grades vary widely. Some children attend multiple years of kindergarten. Some skip kindergarten all together. Some districts focus on social goals while others focus on academic priorities. As important as these early experiences are to later success, children transition to first grade at differing rates with differing levels of social and academic experiences. The kindergarten grade in particular can take many forms (West, Denton, & Germino-Hausken, 2000).

In school districts across the country, children are assigned by parents, teachers and school administrators to differing paths as they move to first grade. Most children receive one year of kindergarten. But, many receive multiple years of varying content as they transition to first grade. These differing types and levels of content provide the foundational social and academic precursors of later outcomes (Butaine, 1997).

This dissertation will describe and compare the child and family variables that predict positive and negative outcomes in multi-year kindergarten paths for a nationally representative sample of kindergarten children. Chapter I will provide an introduction to the study and an overview of the purpose and scope of the study. The first section of Chapter 1 will describe the problem addressed by the study. The second section will provide a description of the purpose of the research. The third section of this chapter will describe the research objectives of the study. The fourth section will state the hypotheses of the study. The fifth section will provide definitions of terms used in the study.

Problem Statement

Over the last several decades concerns have been growing about how best to prepare children for success in school (Shepard, 2004). Since the 1970s the debate has evolved as to whether long term success is enhanced by passing struggling students to subsequent grades (social promotion) or whether children are better off being retained in grade (National Commission on Excellence in Education, 1983a; Shepard & Smith, 1989). Both advocates for social promotion and retention have the same goal—enhancing the long term success for struggling students (Karweit, 1999).

Increasingly, research has been directed at understanding the impact of school readiness and early grade retention on subsequent student success (Hong & Raudenbush,

2005; Magnuson, Ruhm, & Waldfogel, 2007). Many early childhood advocates cite information about school readiness research as support for providing quality early school experiences for young children (Holmes, 1989; Jimerson et al., 1997). Further, questions regarding mechanisms to enhance school success have raised questions about the practices of requiring children to repeat grades for which they are deemed unsuccessful (Jimerson, 2004).

Most children moving through educational systems in the United States receive one year of traditional kindergarten. However many children receive one of three alternate types of kindergarten:

1. A developmental kindergarten introduced as a bridge to “real” kindergarten. Sometimes called “*begindergartens*”, these kindergarten experiences are designed for children considered not able to succeed with traditional kindergarten content,
2. A transitional kindergarten classroom introduced after a year of traditional kindergarten. Children are assigned to transitional kindergarten classrooms when they struggle with kindergarten content and routines and are judged to need content that bridges the kindergarten content and the more difficult content in first grade.
3. A second year of traditional kindergarten when it is believed that children need more time with the same content. Children in this group repeat traditional kindergarten.

Each of these types of kindergarten experiences result in children spending multiple years in kindergarten before they transition to first grade. While each of these types of experiences have been conceptualized as meeting differing educational purposes, each

experience results in a child spending multiple years before accessing the curriculum of first grade. As such, each type has been characterized as a form of kindergarten retention (Shepard, 2004).

The efficacy of retention as a method of preventing further failure has been debated for decades (Byrnes, 1984; Hong & Raudenbush, 2005; Jackson, 1975; Jimerson et al., 1997). Arguably, research has revealed positive and negative affects of retention; however, the preponderance of evidence shows that retention without modifications in instruction is ineffective and possibly harmful (Jimerson, 2001, 2004).

Even though research paints a cautionary picture of the outcomes for retained children, holding children in kindergarten for more than one year remains a highly popular strategy. Approximately 5-10% of kindergarten children across the country are retained in grade each year (Silberglit, Jimerson, Burns, & Appleton, 2006; Zill & West, 1997).

Decisions to place children in a multi-year track are made largely by teachers and administrators with the agreement of parents (Byrnes, 1984; Cross, 1984; Diamond, Reagan, & Bandyk, 2000; Tanner & Galis, 1997; Tomchin & Impara, 1992). The large number of children retained in kindergarten each year despite the evidence to support retention as an effective intervention speaks to the intuitive attraction of retention as an attempt at providing a fair method for catching children up. Teachers and administrators continue to believe that retention is an important tool for supporting later success (Tanner & Galis, 1997; Wesley & Buysse, 2003). Arguably, most children progress in the curriculum once they are retained in grade (Alexander, Entwisle, & Dauber, 2003;

Pierson & Connell, 1992). But little is known about the conditions of the success or failure of children who have been retained.

Decisions to retain children in kindergarten are made based upon beliefs about how children learn, how instruction should be delivered and the fit between children and the classroom (Piotrkowski, Botsko, & Matthews, 2001; West, Germino-Hausken, & Collins, 1993). Some researchers have found links between retention decisions and income, ethnicity and race of school personnel and families ((Beady & Hansell, 1981; Cosden, Zimmer, Reyes, & del Rosario Gutierrez, 1995; Cosden, Zimmer, & Tuss, 1993).

Some of the same beliefs that contribute to the decisions to assign children to multiple year kindergarten programs may also influence the design of the classroom experiences that children receive (Meisels, 1992). For example, the specific factors that parents identify as leading them to make decisions about timing of early schooling have been found to predict differences in the types of programs selected and also success found later (Stipek & Ryan, 1997). In addition, teachers' early beliefs about the quality of their relationships with parents and students have been found to independently predict later academic outcomes. Teachers' perceptions of conflict or over-dependency on the part of children predict less positive academic outcomes for those children (Hamre & Pianta, 1999). Finally, the quality of classrooms has been shown to relate to teacher, family and school characteristics (Pianta, La Paro, Payne, Cox, & Bradley, 2000).

As stated earlier, multiple year kindergarten experiences are designed to foster greater success for struggling students. However, research on the efficacy of grade retention and transition classroom experiences has provided little evidence that these

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interventions are effective (Hauser, 2001; Hong & Raudenbush, 2005; Hong & Yu, 2008; Jimerson & Ferguson, 2007). It is therefore important to understand the child, family, classroom and school factors that are associated with multiple year kindergarten programs.

Purpose

The purpose of the study is to identify and describe variables that predict and differentiate which children will be assigned to multiple year kindergarten programs. To accomplish this, data collected by the National Center for Education Statistics (NCES) for the Early Childhood Longitudinal Study-Kindergarten cohort from 1998 to 1999 will be analyzed. Data were obtained from a nationally representative, randomized sample of kindergarten children which documented health, educational progress, family, teacher, classroom and school variables. The study describes overall results for 21,260 children who participated in the study. Data are representative of all children entering kindergarten in 1998. Of those children, 850 entered after having previously spent one or two years in kindergarten. Sampled children were tracked through third grade. These data have been made available to the public for analysis.

The ECLS-K database contains data to describe and analyze the ecological context of children's early school experiences. Measures of physical health, social development, emotional well being and cognitive skills of children are documented. Family background, classroom experiences and characteristics of the elementary school are also documented. Specifically, this proposed study will analyze and describe data obtained through parent surveys, school records, and direct assessments. Variables for

children entering kindergarten for the first time will be compared to those for children who have experienced multiple years in kindergarten.

Research questions

This study will focus on kindergarten retention and predictors of third grade test scores for reading and mathematics. Data collected from the Early Childhood Longitudinal Study-Kindergarten track family, school and child variables. Grade retention data are also reported.

The question addressed in this study is as follows:

- 1) Are differences in family or child characteristics significantly related to whether or not children experience multiple year kindergarten programs?
- 2) Are there family and student characteristics that predict whether or not students will experience multi-year kindergarten programs and those who do not?

Definition of Terms

- Developmental kindergarten—A transitional classroom experience with a modified kindergarten curriculum that takes place prior to a regular year in kindergarten
- On time entry kindergarten—Entry to traditional kindergarten at the date specified by the state or district
- Delayed entry to kindergarten—Waiting a year or more after the specified entry date to attend kindergarten
- Transitional kindergarten—An extra grade between kindergarten and first grade with a modified curriculum designed to bridge kindergarten and first grade

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- Kindergarten retention—More than one year in kindergarten with repetition of the kindergarten curriculum
- Direct entry to first grade—Entry to first grade with no prior kindergarten experience

CHAPTER 2

BACKGROUND FOR THE STUDY

Introduction

For children in the United States, transition to “real school” can take many different paths. Most children enter first grade on time and with one year of kindergarten experience. Many children do not. Because of this, a child’s first opportunities to learn the academic content and social expectations of the district may be experienced in many different ways (McClelland, Acock, & Morrison, 2006). Whichever path children take, they receive experiences that shape their learning in first grade and beyond.

There are two patterns of experience that typify the ways children travel to first grade. Most children arrive at first grade after receiving one year of instruction in a kindergarten classroom (West, Denton, & Reaney, 2000). While that kindergarten year may take many forms, these children begin kindergarten at the date specified by their districts and transition to first grade after one year of kindergarten content. Between 90 and 95% of children beginning “real school” move to first grade after attending only one year of kindergarten (Frey, 2005; Zill & West, 1997, 2000).

A second group of children receives more than one year of kindergarten. In any given year, between 5 and 10 percent of kindergarten children participate in differing types and levels of kindergarten content (Alexander et al., 2003; Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2000; Karweit, 1999; Zill, Loomis, & West, 1997). For these children, parents, teachers and school administrators decide that a second or third year of kindergarten is necessary.

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When children receive more than one year of kindergarten, their experiences can take several forms. The first type of multiple year kindergarten experience can be termed retention. Retention refers to the practice of requiring kindergarten children to retake the kindergarten grade. The second way that children receive more than one year in kindergarten is by requiring that they experience a transition grade before entering kindergarten. This is referred to as developmental kindergarten. After attending a developmental kindergarten grade, children receive a traditional kindergarten grade. The third type of extra year kindergarten is experienced when a child receives a traditional kindergarten grade followed by a transition grade between kindergarten and first grade. During this year, children receive curriculum that bridges the content in kindergarten with the content in first grade. Each of these types of experience provides an important foundation for early learning.

Most studies of multiple year kindergarten programs do not differentiate between the type of experience: retention, developmental kindergarten or kindergarten transition class. Researchers typically use the child's age in a particular grade to study predictors and affects. For this reason, it is important to recognize that children with multiple year experiences may enter first grade with a variety of experiences. This dissertation will report analysis of data collected for children who spent more than one year in kindergarten without specifying the type of multiple year experience.

Primarily, teachers, parents and school administrators make decisions about which early school experience a child will receive in an effort to support success for children at risk. Recent research has shown that by fifth grade, as many as twenty percent of children will have been retained at least once in the early grades (Piotrkowski

et al., 2001). These decisions significantly impact children by determining the timing, depth and breadth of instruction and social experiences that children will receive. It is necessary to understand the characteristics of kindergarten children at risk and their classroom experiences to understand the variables predicting retention.

This chapter will contain four sections. The first section will describe the characteristics of kindergarten students who are at risk for multiple year kindergarten grades. The second section will describe research on predictors of social and academic risk. The third section describes methodological issues associated with studying retention and multiple year grades. The fourth section summarizes the chapter and discusses the need for this research.

Characteristics of kindergarten students at risk

Opportunities for children to receive academic and social supports prior to kindergarten vary from state to state and community to community (Barnett, Hustedt, Hawkinson, & Robin, 2006; Cost Quality and Child Outcomes Study Team, 1995; Magnuson, Meyers, Ruhm, & Waldfogel, 2004). Because of the inconsistency of early education and support, children enter kindergarten with very different learning histories (Battistich, 1995). Kindergarten readiness skills vary across and within race, gender, family income levels, geographic-region and neighborhoods (Carpiano, Lloyd, & Herzman, 2009). The result is that children across the country enter kindergarten with a wide range of skills (Doherty, 2002; Duncan, 1997; Lee & Burkam, 2002; Panel, 1998; Pianta & LaParo, 2003; Zill & West, 2000).

While most children will demonstrate some form of vulnerability throughout their school experience, some forms of risk have been associated with academic and social

challenges (McClelland et al., 2006). Increasing numbers of children enter kindergarten with vulnerabilities that must be considered when planning supports (Stormont, Espinosa, Knipping, & McCathren, 2003; Walker, 1998). Health problems, lack of early cognitive and academic skills, differing language abilities and difficulties in social interactions contribute to vulnerabilities that make careful planning in kindergarten necessary (Wertheimer & Croan, 2002).

In a study using Early Childhood Longitudinal Study-Kindergarten (ECLS-K) cohort data, Wertheimer, Croan, Moore and Hair (2003) described risk factors of children entering kindergarten in the 1998. These researchers analyzed data gathered from a nationally representative sample of children. In this study, significant numbers of children entered kindergarten with risks in health, cognition, social and emotional development. Many of these areas of need overlapped.

Wertheimer et al. (2003) found that 31% of all children in the study entered kindergarten with at least one significant health challenge. Health challenges included being overweight, having delays in fine or gross motor development, having poor health or having a disability. Projected to the population, children with health challenges represent approximately 1.2 million kindergarten children nationally.

Using tests and teacher ratings of cognition, early literacy, and mathematics, researchers analyzed the types and levels of differences in children entering kindergarten. Wertheimer and colleagues found that 20 % of all entering kindergarten children lagged significantly in one or more of the assessed areas. They estimated that the group of children with cognitive challenges at kindergarten entry approximates 753,000 nationally.

As part of this study, teachers and parents rated the behaviors and qualities of relationships for the children in the sample. Overall, 31 % of the children were rated as entering with social or emotional challenges. Researchers estimate that this represents approximately 1.2 million children entering kindergarten nationally. This number is parallel to the number of children entering with health conditions.

Finally, these data show that many children enter kindergarten with more than one challenge. Between 33 and 51 % of the children who demonstrated poor health, social skills and academic achievement, did so in more than one area. Wertheimer and colleagues also found that about 5% of kindergarten children in the study showed challenges in all three areas. Of the children demonstrating challenges in three areas: 66% were boys, 27% were identified as Non-Hispanic black, 63% were identified as children whose parents had a high school diploma or less,. 55% lived in households with incomes less than \$25,000 per year, 33% were children from homes with a single parent. 20% lived in neighborhoods where parents reported problems with drug use and garbage.

Altogether, the analyses revealed that approximately 56% of children entering kindergarten in 1998 did so with vulnerabilities that must be considered in planning. Wertheimer et al. concluded that in order to support children who enter kindergarten lagging in one or more area, differing levels and types of services must be available. And, for the children who lag in one or more area, services must be designed that address multiple needs. Based on specific needs of children, services to support success can be developed that target the array of needs children present.

In another study of characteristics of children entering kindergarten, Konold and Pianta (2005) examined profiles of 964 typically developing children. Achievement test

scores, teacher and parent ratings were used to analyze children's performance. Using multistage cluster analysis, this research suggested that cognitive skills and self regulation skills develop relatively independently and have points of linkage and points of independence. Children enter kindergarten with differing profiles for self regulation and cognitive skills.

In all, the research found six profile types that relate to achievement.

- Attention problems—Children in this cluster accounted for approximately 10 % of the children in the sample.
- Low cognitive ability—For this group, socio-emotional functioning was average but tests of achievement and cognition revealed low scores. This group accounted for 7% of the sample.
- Low to average social and cognitive skills.—Children in this group made up 20% of the total sample.
- Social and externalizing problems—Children in this group made up 17% of the children in the sample.
- High social competence and average cognition—This group made up 24% of the sample.
- High cognitive ability and mild externalizing behavior—This group made up 22% of the sample.

First grade achievement on tests of cognition and general academic skills was found to be related to the cluster profiles. Children in the high cognitive, mild externalizing group scored higher than all groups on tests of achievement. Children in the high social competence group performed better than all but the high cognitive, mild

externalizing group. These researchers conclude that given the disparities in competencies as children start school, both developing social competencies and academic competencies must be considered in planning supports for children. Children were protected from risk by either social or cognitive competence.

The studies by Wertheimer, et al. and Konold, et al. highlight the differences in the skills and the abilities of children as they enter kindergarten. For children to move successfully to first grade, significant supports must be designed to meet the wide variety of needs. Policies and resources must be aligned to address vulnerabilities as they are exhibited.

Predictors of social and academic success

Many have been interested in predicting the potential success and failure of children in school. This work has intensified along with calls for higher achievement and accountability (LaParo & Pianta, 2000). Achievement of school children in the United States has been compared with that of children around the world with many voicing concerns about the poor performance of children in this country (Griffin, 2007; Starkey et al., 1999). With these concerns come higher expectations for children and school districts (Goldstein, 2007.)

But, defining the elements of success has been less clear. Success in school comprises a broad range of multifaceted, complex components. Specifically in the early grades, there is disagreement about what should be considered important for a child's success in school. One example of the variability of opinions regarding essential content can be seen by comparing early learning content standards from state to state. Some states place a value on the developmental domains of cognition, motor, social and

language development while other states' standards reflect reading, mathematics, social studies and science (Scott-Little, Kagan, & Frelow, 2006).

Along with arguments regarding meaningful constructs of success in school, appropriate and accurate methods for measuring success in the early years has been equally unclear (Meisels & Atkins-Burnett, 1994; Meisels & Fenichel, 1996; National Education Goals Panel, 1999; National Research Council, 1999). Many debate the appropriateness of using tests of young children as a measure of achievement and outcomes.

Student and family characteristics as predictors. Successful completion of grades has been consistently correlated with later success (Jimerson et al., 1997). It is therefore important to fully understand the implications for differing opportunities in the beginning of school. Parents, teachers and administrators make decisions about whether children will wait a year to enter kindergarten, skip kindergarten, receive extra kindergarten or experience a different type of kindergarten (Cosden et al., 1995; Fine & Davis, 2003; Morrison, Griffith, & Alberts, 1997; Noel & Newman, 2003; Piotrkowski et al., 2001). Most of these decisions are made with the intention of providing the support necessary for children to succeed in the early grades and beyond.

Decisions to assign children to multiple years of kindergarten result in the over representation of some groups in these experiences. Hauser (2001) reviewed United States' census data from 1962 – 1996. For methodological reasons described in more detail later in this chapter, Hauser studied children who were old for their grade (age-grade retardation.) These data reveal a consistent pattern in the gender, ethnicity and family make up of children who were old for grade.

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For each of the years in question, boys were assigned to multiple year experiences in higher numbers than girls. At age six, boys are 5% more likely than girls to be old for grade. Boys fall further and further behind as they progress through school.

Differences were also found when examining patterns based on race and ethnicity in Hauser's data. He found that for ages six to eight, the rates of age-grade retardation for Caucasian, African American and Hispanic children were very similar. However, when analyzing data for nine to eleven year old children, disparities widen. At that point, African American and Hispanic children tended to be older than expected at rates 5-10% higher than Caucasian children. These differentials continued to grow.

In a separate analysis, Hauser, Pager & Simmons (2004) reviewed Current Population Survey data from 1972 – 1998. These files contain between 57,500 and 63,500 cases for each age level. Patterns emerged in the analysis of the variables relating to which children were old for their grade and which were not. As in Hauser's earlier analysis, gender and race were strong correlates. In addition, differences were found in maternal education, number of parents in the home, family income, home ownership, residential location and regional location for children who were old for grade and those who were not.

Researchers agree that socio-economic status, gender, ethnicity, family and community characteristics tend to predict who will be promoted after completing a grade and who will be retained (Blair, 2001; Magdalena & Duku, 2007; Pati, Hashim, Brown, Fiks, & Forrest, 2009; Silberglit et al., 2006). The duration and number of times a family moves into poverty has also been linked to lower academic achievement (Moore, Redd, Burkhauser, Mbwana, & Collins, 2009). However, the degree to which intelligence and

academic achievement play a role in the decision to retain has been hotly debated (Graue, 1993; Jimerson et al., 1997; Shepard & Smith, 1989). Some researchers have found that retained students do not differ significantly from their promoted peers on tests of intelligence and achievement (Jimerson et al., 1997; Niklason, 1984).

The finding that boys are disproportionately assigned to multiple year grades has been consistent across time. Many theories have been generated as to the reasons for this. Many neurological studies have delineated differences in the maturing brain of males and females finding that areas related to reading and writing focused curriculum of female brains mature faster than those of males (Sax, 2001). Other theories related to the patterns of rewards and curricula embedded with gender expectations (Pollack, 2006) which is often invisible to teachers and children (Reichert & Kuriloff, 2004).

Often, when children enter kindergarten, little is known about their skills and abilities. Without the information provided by assessment, observations and experience, teachers, parents and administrators base decisions on their judgments about the success of the child. Retention in early grades has been found to occur at a higher rate than other grades because of the perception by parents and school personnel that some children require more time due to immaturity (Lorence, Dworkin, Toenjes, & Hill, 2002).

In an effort to mitigate perceived immaturity, many states have been moving their kindergarten entrance dates from winter to fall and summer months in order to provide extended time for maturation (Cannon & Lipscomb, 2008). In surveys reported by the educational research service, the average age increased from four years eight months in 1958 to four years eleven months in 1985 (Crosser, 1998). The National Center for Education Statistics reports that approximately 64% of kindergarten children entering

kindergarten in 1998 were between five years and five years, seven months of age. This gradual increase in the age at which children enter kindergarten has been called “the graying of kindergarten.”

When readiness for promotion to first grade is conceptualized as maturity, the age of the child and specific characteristics perceived to be related to age become a factor in determining whether a child is promoted. The theory that young children are less ready than older children can be examined in the research literature. Research on the youngness of children typically examines children with birthdays close to the cut off date for entrance and compares their performance with children whose birthdays are later. Many of these studies demonstrate that younger children typically perform slightly lower on standardized tests than their older classmates but the effect sizes were small and that differences typically disappear by third grade (Lincove & Painter, 2006; McNamara, Scissons, & Simonot, 2004)

Another method of studying youngness is to look at outcomes for children with early or late birthdays within the school year. The outcomes most typically researched are retention and placement in special education. This research has found that younger kindergarten children were more likely to be retained (Langer, Kalk, & Searls, 1984; Uphoff, 1985; Uphoff & Gilmore, 1996). Studies have also found that younger children were more likely to be referred for special education services (DiPasquale, Moule, & Flewelling, 1980).

The appropriate age for kindergarten entrance has been debated for decades. Central to the debate is the belief that some children have not matured enough to be able to be successful in kindergarten. There is an assumption that there is a relationship

between age and academic competence. (Graue & DiPerna, 2000; Langer et al., 1984; Shepard & Smith, 1986). For children who appear to be immature, parents and school personnel believe that delaying kindergarten entrance or providing a multi-year kindergarten experience is the best intervention (Graue, 1993; Shepard & Smith, 1989; Uphoff & Gilmore, 1996). Caucasian boys in upper middle income families tend to experience a delayed kindergarten start in higher proportions than other groups (Frey, 2005).

Teachers' perceptions and beliefs as predictors. The relationships that children develop with their teachers are very important for success in school (Saft & Pianta, 2001). Children who have close relationships with teachers and parents are more likely to progress positively in social and academic domains (Ladd, Birch, & Buhs, 1999; Silver, Measelle, Essex, & Armstrong, 2005). Teachers' perceptions of the quality of their relationships with children have been found to predict outcomes for children (Hamre & Pianta, 1999), attitudes about school, (Birch, 1997) and the perceptions of peers in the classroom (Hughes, Cavell, & Prasad-Gaur, 2001; Hughes, Cavell, & Wilson, 2001).

Teacher-child relationships are dynamic and many layered. The teacher's perception of a pattern of conflict with the child has consistently been associated with poor academic and social outcomes (Birch & Ladd, 1998; Birch, 1997; Hamre & Pianta, 2001; Howes, 1994; Mantzicopoulos, 2005; Pianta, 1994; Pianta, Hernandez, & Ferguson, 1997; Stuhlman & Pianta, 2001). Studies also have shown that boys typically have been represented as having conflict with teachers more often than girls (Birch, 1997; Kesner, 2000; Stuhlman & Pianta, 2001).

In addition to teachers' perceptions of relationships with children, teachers' perceptions of relationships with parents have been found to predict later school achievement (Birch, 1997; Pianta, 1999). Teachers' beliefs about the degree to which parents value education have also been found to be correlated with academic performance of children (Hauser-Cram, Sirin, & Stipek, 2003; Hill, 2001). Studies have found links between lower ratings of children's competence when teachers perceive value differences with parents. These linkages were stronger with teachers whose instructional practices were observed to be curriculum-centered rather than student centered (Hauser-Cram, et al., 2003.)

Teachers' perceptions and beliefs about the capabilities of young children in their earliest school placements relate to later academic and social success. Teachers' expectations have been found to be related to the child's SES and perceived developmental age (Auwarter & Aruguete, 2008). In a study conducted by Shepard & Smith (1986), demographic, family and academic variables for kindergarten children in a Boulder Colorado school district were studied. In addition, extensive interviews were conducted with teachers around their curriculum and goals. Analyses showed that the age the child entered kindergarten was not a primary determiner of academic outcome. Importantly, this analysis also found that teacher beliefs about how children learn and develop were associated with teacher perceptions about the readiness of individual children.

Teachers in this study were surveyed to determine their beliefs about the extent to which biology, environment or an interaction of biology and environment determined the child's development of knowledge and skills. Teachers holding the biological view

retained students in significantly higher rates than teachers who believed the environment or an interaction of biology and environment determined development. Teachers' beliefs about the source of development tended to be significantly related to the beliefs of other teachers in the same school buildings.

Teacher expectations may play a particularly important role in predicting outcomes for young children. Age and development have been found to moderate the effects of teacher expectations on outcomes. Stronger effects have been shown in classrooms where young children receive differential treatment based upon teacher expectations (Kuklinski, & Weinstein, 2001). Teachers' lower expectations have been found to predict lower achievement for African American children (Pigott & Cowen, 2000). The relationship between teachers' perceptions and the outcomes of young children has led many to call for a focus on the unique circumstances of building relationships of teachers, parents and children in the transition to kindergarten as a method for supporting positive outcomes (Ramey & Ramey, 1999).

Teacher's ethnicity and race as predictor. As described earlier, a child's ethnicity or race has been positively correlated with retention at all grades. In addition to this consistent finding, a teacher's own ethnicity has been shown to relate to their perceptions of children's behavior (Ehrenberg, Goldhaber, & Brewer, 1995; Gomez, 1993) whether or not the child's ethnicity is considered (Beady & Hansell, 1981). Teacher expectations and communication patterns have been shown to vary dependent upon the ethnicity of the child (Brady, Tucker, Harris, & Tribble, 1992). Even when teachers are matched with children on ethnicity, the child's race has been found to be a strong determinant of teacher ratings and expectations.

Whether a teacher's ethnicity predicts outcomes differentially for children of varying races has been debated (Sbarra & Pianta, 2001). Research on the congruence of a teacher's and child's race and subsequent outcomes has provided mixed results. Some researchers have found that African American teachers exhibit less negative expectations and evaluations for African American and Hispanic children than Caucasian teachers (Zimmerman, Khoury, Vega, & Gil, 1995). Other studies found that there is little difference in the expectations and ratings of African American teachers and their Caucasian counterparts (Bahr, Tom, & Cooper, 1991; Wilson, 1992).

Pigott & Cowen (2001) examined potential racial bias in teacher ratings of kindergarten through fifth grade children. African American and Caucasian teachers' ratings were evaluated for differences in ratings of children's behavior and academic skills. Teachers were matched for age and years of experience. Children were matched for school, grade level, race and SES. Findings indicated that race of the teacher was not a strong determinant of the teacher's ratings of achievement or expectations. The strongest determinant found was the race of the child. Both groups of teachers rated African American children lower on ratings of achievement, behavior, and expectations for success. The finding that the race of the child predicts teacher evaluations of achievement is consistent with prior research (Dauber, Alexander, & Entwisle, 1993).

Intervention and classroom factors as predictors. In order to understand the role of multiple year kindergarten programs in putting the child on a path to better outcomes, it is important to understand what is known about the needs of children and what research has shown to be effective intervention strategy. As a conceptual model, one way to understand the complex and interacting array of influences impacting outcomes for

young school children is through systems theory (Stormont et al., 2003). Pianta, (1999) extends the theories of Bronfenbrenner (1979) and Sameroff (1989) to describe a systems model that is useful for this analysis.

As described by Pianta, multi-leveled systems are categorized into four levels that range from distal to proximal to the child. The community and culture in which the child is raised provides the most distal first level. Community and cultural resources such as access to health and social services fall into this level. The second level impacting competence and vulnerability is that of the classroom. Curriculum, schedules, instruction methods, materials and resources play a role in this level. The third level is that of dyadic systems. Systems of communication and relationships with friends, parents and teachers fall into the third level. The fourth level includes systems specific to the child. This level includes physical characteristics as well as the child's learning history.

Pianta describes risk as the probability of linking a predictor with an outcome (Pianta, 1999). This definition places focus on the likelihood of a particular outcome occurring and the levels and types of activities necessary as prevention. The likelihood is seen as applying to the individual child based upon the systems that support the child. Thus, levels of risk would vary for children based upon systems of support.

Intervention based on systems theory places a high value on the interactions of children, teachers and curriculum. Pianta believes the unit of analysis for preventative interventions should be at the most proximal level to the child. While most interventions take place at the school and classroom levels, Pianta believes that interventions should take place at the child and dyadic level.

Pianta outlines three characteristics of strong systems of support. Systems must be flexible enough to accommodate the dynamic interactions of systems impacting the child. In addition, systems must have the ability to differentiate needs of children in order to provide supports appropriate to those needs. A critical component of systems that support children is that they must provide varied, multi-leveled feedback functions.

According to Pianta's (1999, 2006) application of systems theory, teachers play an important role in altering a child's response to risk. The relationship of parents and children provide the foundation for relationships of teachers with children. Specifically, interactions around behaviors, feedback during learning experiences and facilitation of peer interactions is seen as critical for mediating the likelihood of negative outcomes (Hamre & Pianta, 2007).

Pianta describes two important ways in which the teacher-child relationship supports positive outcomes in school. First, teachers provide support for basic processes of development and learning. Attention, communication and dispositions are an example of the functions supported by relationships. Second, teachers provide instruction. In this instance, the teacher provides specific, skill based support to children. Teachers must constantly move between the two types of functions to support learning. This dynamic interplay is necessary to mediate risk.

It is especially important that children experience both emotional support and intentional instruction in the early grades. Teachers must develop close, supportive relationships and they must develop careful plans to scaffold learning based upon what they know about children and practice. Research has shown that small increments in early achievement play a larger role in outcomes later (Alexander, Entwisle, & Kabanni,

2001; Battistich, 1995; Ferguson, 1998; Hamre & Pianta, 2005; Phillips, Crouse, & Ralph, 1998). A child's prior achievement has been found to mediate the effects of socio-demographic variables (Gill & Reynolds, 1999) thereby changing the likelihood that demographic variables will predict negative outcomes.

The transition to kindergarten typically is not a gradual process. Children must adapt to changes in their new relationships and environments very quickly. This transition can be described as an ecological shift due to the comprehensive change in environment, peer structure, schedules and expectations from pre kindergarten to kindergarten. For children to adapt successfully, they must be able to engage and participate in a variety of social and instructional experiences.

Before beginning kindergarten, most children spend their days in homes, preschools or day care centers. As they begin school, they transition to large school buildings. They also are introduced to different materials, classrooms and play areas than they experienced before school. Children must adapt to these new environments.

In addition to new environments, children are exposed to new cultures, values and expectations as they begin school. Kindergarten teachers and building principals value and expect independence and cooperation (Arbeau & Coplan, 2007; Johnson, Gallagher, Cook, & Wong, 1995). Time involved with academic curriculum increases along with expectations for academic performance. And, the structure of the day becomes more rote and adult directed than earlier (Hamre & Pianta, 2007).

Social ecologies change for children entering kindergarten. Depending on the configuration of schools in the district, children frequently say goodbye to caregivers and friends as they transition to school (Ladd & Price, 1987). Children must also adapt to

larger numbers of same aged peers in the peer group (Ladd, Herald, & Kochel, 2006). Whereas families and early childhood groupings typically have smaller adult to child ratios and sizes, kindergarten classrooms contain more children with fewer adults. The transition to kindergarten itself can create challenges that exacerbate vulnerabilities.

In order to successfully adapt, children need to be able to participate and engage with peers, teachers and curriculum. Classroom participation is a strong predictor of school achievement (Ladd et al., 1999; Rummel, 2007). The behavior styles that children rely upon to adapt to these changes at kindergarten entry predict the numbers and types of relationships they form with peers and teachers (Ladd et al., 2006).

Teachers play a critical role in designing support that connects children to peers, adults and curriculum. They must quickly become acquainted with children and families to begin to provide early experiences that address particular needs and prevent social and academic failure. The next section of this dissertation describes specific interventions known to prevent social and academic failure.

Intervention to support social knowledge and skills as predictors. Early family relationships create a foundation for emotional and social relationships children develop as they enter school (Shonkoff & Phillips, 2000a). The quality of the relationships that children develop with teachers and children influences the types and levels of kindergarten experience. These experiences play a role in achievement and retention decisions.

Social experiences of families in the early years impact later social and academic success. Parents' skills, expectations, and academic socialization have been found to be important contributors to positive academic and social outcomes (Hill, et. al., 2001; Ladd,

et al., 1999). Parents' early expectations for success of their children have been found to relate to academic socialization (Christenson, 1992; Clark-Stewart, 1988). A warm parenting style along with high expectations has been correlated with higher scores on achievement tests later (Dornbusch., Ritter, Leiderman, Roberts, & Fraleigh, 1987).

The young child's early experiences leading to positive social relationships and skills for sustaining interactions can provide important protection from risk. The early ability to form positive social relationships and engage in pro-social behavior with teachers and peers has been found to be important for long term school success (Cavanaugh, Lippitt, & Moyo, 2000; Hair, Halle, Terry-Humem, Lavelle, & Calkins, 2006; Mantzicopoulos, 2003a). The young child's behavior and the child's self concept have been found to be related to later achievement (Ladd et al., 2006; McClelland et al., 2006; Miles & Stipek, 2006). Cognitive self-control and regulation of emotions in the early years have been found to predict scores on tests of reading and math in later grades (Kurdeck & Sinclair, 2000). Experiences supporting the development of social skills also support academic achievement.

Everyday interactions between teachers and children play an important role in shaping relationships in the classroom. The types, qualities and quantities of a teacher's interaction with children in the early grades vary from classroom to classroom and child to child.(National Institute of Child Health and Human Development-Early Child Care Research, 2005; National Institute of Child Health and Human Development-Early Child Care Research Network, 2002). It is important to understand the effects of the emotional environment in the classroom as well as the match with the child's capabilities and needs (Morrison, 2002; Morrison, Robertson, Laurie, & Kelly, 2002).

Teachers' emotional support fosters dispositions important to learning (Crosnoe, Johnson, & Elder, 2004; Zins, Bloodworth, Weissberg, & Walberg, 2004). A child centered climate in the early grades has been found to be related to more on-task behavior and engagement with the curriculum (Pianta, LaParo, Payne, Cox, & Bradley, 2002). Research has also shown that a child's perception of a positive relationship with the teacher predicts gains in engagement (Furrer & Skinner, 2003).

Children enter kindergarten with a wide variety of behavioral repertoires. Data from national surveys suggest that 10 – 25 % of early school-age children demonstrate aggressive conduct problems (Webster-Stratton, Reid, & Hammond, 2004). Early aggression has been linked to peer rejection and early adjustment difficulties (Ladd, et al. 2001.) These conduct problems can increase across time leading to academic problems, substance abuse, delinquency and drop out (Snyder, 2001). Early intervention can interrupt the progression of negative outcomes for children exhibiting conduct problems.

Webster-Stratton, et al, (2004), describe effects of a parent, teacher and child training program as an intervention for treating early conduct problems. Families of 159 preschool and early grade children diagnosed with oppositional defiant disorder were assigned to a treatment group including 1) parent training, 2) parent plus teacher training, 3) child training, 4) child plus teacher training, 5) parent, child plus teacher training or 6) a control group. Training consisted of strategies for preventing and managing aggression, problem solving, conflict resolution and social skills. After receiving training for 6 months, fewer conduct problems were observed over all. The combination of parent, teacher and child training produced outcomes in teacher behaviors and reports of problems in the classroom. These results were seen regardless of the income levels of the

children. Researchers attribute the success of the training to the strengthening of the skills of children, parents and teachers as a mechanism to produce protective factors.

Lack of problem solving skills has been identified as a source of social and academic difficulties (Karnes, Johnson, & Beauchamp, 1989; Shure, 1999). Children's problem solving ability has been shown to correlate with their externalizing, internalizing, attention behaviors and social competence. Increasing the quality and quantity of pro-social solutions to problems was found to decrease externalizing behaviors and increase parent/child and teacher/child relationships over time (Youngstrom et al., 2000).

Intentional instructional supports for social interactions and development of relationships is essential for school success (Hamre & Pianta, 2005; Webster-Stratton et al., 2004). Didactic games that require children to generate solutions to problems and predict the consequences of solutions have been found to decrease impulsive behavior for preschool and kindergarten children (Shure, 1999; Youngstrom et al., 2000). The results were found to be unrelated to gender, general intelligence or language ability.

As described above, many challenges in the transition to school create a potential for school failure. However, strategies exist that have been shown to change the trajectory toward negative outcomes for children experiencing difficulties with social interactions. Along with providing a sensitive, child centered climate, social skills training for teachers, parents and children have been found to increase positive social interactions and relationships (Joseph & Strain, 2003).

Literacy skills intervention as predictors. Essential reading skills begin to develop much earlier than kindergarten (McCardle, Scarborough, & Catts, 2001;

Senechal & LeFevre, 2002). Vocabulary and early literacy skills have been found to be strong predictors of overall school achievement (Walker, Greenwood, Hart, & Carta, 1994; Whitehurst & Lonigan, 2001). Early receptive and expressive oral language learning takes place beginning in infancy. Research has revealed that understanding the meaning of words and the pattern and rules of language are important precursors to beginning reading (Snow, Tabors, & Dickinson, 2001; Watson, 2000). Hearing and distinguishing the sounds in words and being able to rapidly access information known about these sounds also are necessary early literacy skills (Adams, 2003).

In order to learn to read, children must be able to use their early knowledge of meaning, structure and the sounds of language together to decode letters and make sense of the written word. Early literacy and language skills are integrated and linked to later skill development (Chaney, 1998; Justice & Ezell, 2001; Justice, Invernizzi, Geller, Sullivan, & Welsch, 2005). These skills predict reading skills later. Literacy and language experiences prior to school play a role in later reading achievement (Kagan, Rigby, & 2003).

Research on predictors of early literacy skill has yielded important information regarding essential early literacy development. Both the National Reading Panel and the National Early Literacy Panel came to similar conclusions about literacy skills and abilities that are linked to later outcomes. After reviewing thousands of studies of literacy research on children from infancy through first grade, both Panels identified decoding and comprehension as skills that begin to develop in early childhood and provide necessary supports to later learning.

Specifically, the National Early Literacy Panel reviewed 7,000 studies. From those studies, 300 met the requirements determined for the synthesis. Researchers determined that alphabet knowledge, phonological awareness, rapid automatic naming, writing (name) and phonological short term memory provide unique predictive utility. Further, skills that predicted later, conventional literacy skills were unique predictors whether they children were in preschool or kindergarten. Oral language was determined to be an important predictor for both decoding and comprehension. While phonological awareness was found to be a strong predictor, assessments of rhyme did not necessarily uniquely predict outcomes (National Early Literacy Panel, 2007).

Large numbers of children enter kindergarten with significant difficulties in beginning vocabulary and emergent literacy skills; (Hart & Risley, 1995; Snow, Burns, & Griffin, 1998; Stipek & Ryan, 1997). Providing interventions that support growth of early literacy skills can significantly improve outcomes for those children (National Reading Panel, 2000; Smith, Baker, & Oudeans, 2001). Research has also shown that for many children, a failure to provide appropriate early literacy experiences results in poor outcomes for years to come (Foorman, Francis, Shaywitz, Shaywitz, & Fletcher, 1999; Juel, 1988, 1991; Lenz, 1988; Scarborough, 1998).

In order to study the elements of successful early literacy intervention, the National Early Literacy Panel reviewed and synthesized 280 research articles. Articles were categorized into intervention type including: making sense of print, reading and sharing print, parent and home programs, preschool and kindergarten programs, and language enhancement. Interventions that provided instruction in code-related skills were determined to be highly successful in supporting later skilled reading. Most of the

studies involved phonological awareness interventions. The most effective programs combined phonological awareness experiences with print awareness experiences.

Shared-book reading demonstrated a significant effect in promoting oral language. The type of shared book reading determined the size of the effect. Guided shared book reading was found to be related to larger effects. Language interventions demonstrated a significant moderate effect on oral language development. Parent and home programs showed a moderate effect on oral language and cognitive abilities.

As a group, undifferentiated kindergarten and preschool programs showed a weak effect on oral language, alphabet knowledge, cognitive ability or reading. This is an important finding when considering the number of children in kindergarten who begin kindergarten with few language and literacy skills and are at risk for delayed entry or retention. The research is clear that early supports for children with reading difficulties prevent long term negative outcomes(Juel, 1991; Justice, Mashburn, Hamre, & Pianta, 2008). However, when children are held multiple years in kindergarten or preschool programs that do not match their needs for instruction with effective interventions, children may not progress comparatively. It is important that children at risk in preschool and kindergarten receive curriculum that provides the skills for success.

Small group interventions that are focused on specific identified needs of children have been shown to be effective improving reading achievement in the early grades (Taylor, Pearson, Clark, & Walpole, 2000; Veluntino & Scanlon, 2001). Early and accurate identification of the range of skills needed for successful reading is the first step in designing successful interventions. Once learning needs are identified, interventions

which provide support targeted to those needs have demonstrated success in raising achievement and providing more success in early reading (Torgeson, 2002).

By design, multiple year kindergarten experiences provide additional time for assessment and intervention to take place. As stated earlier, teachers, parents and administrators decide who will receive a multiple year kindergarten program in order to support success. Therefore, teachers must make correct decisions about who to target for intervention, what skills should be targeted and what intervention strategies to employ. There is evidence that teachers' views of kindergarten readiness are influenced by their experiences as kindergarteners (Lin, Lawrence, & Gorrell, 2003). Behavioral outcomes such as effort and social skills have been identified as major criteria for evaluation decisions (Rathbun, Walston, & Hausken, 2000). Kindergarten teachers have been found to view their role as primarily that of being an agent for social development (Heaviside & Farris, 1993). Research has shown that kindergarten teachers value this role more than their role in promoting academic skills (Karnes et al., 1989; Lin et al., 2003).

Teachers' beliefs about the impact of specific elements of literacy development are related to their ability to differentiate and accurately identify literacy skills in children (Moats, 2001). Typically, teachers make judgments about a child's literacy skill before any formal literacy screening or assessment takes place (Klein & Kelly, 1996). Teacher perceptions of literacy skills have been found useful in supporting identification of children with literacy risk. A combination of teachers' perceptions and literacy screening have been found to predict children who have literacy needs at higher rates than either would have predicted alone (Bailey & Drummond, 2006; Flynn & Rahbar, 1998). However, research has also shown that while teachers' perceptions may generally

identify children with literacy learning needs, teachers do not consistently identify specifics of those needs.

In a study by Baliey and Drommond, (2006), teachers' perceptions about children's literacy skills were compared to those identified by standardized literacy assessments. While teachers tended to identify the same children as screening assessments, the specific categories of need were not found to be congruent. As stated by the authors, "They sense something is wrong but can not pinpoint the particular problem." (pg. 171)

In particular, kindergarten teachers' ratings of literacy skills tended to identify phonological awareness needs of children significantly less than identification found in the assessments. Accurate identification of areas of need is necessary to develop affective interventions. Teachers' judgments about literacy learning needs of children can impact the types of opportunities a child receives in kindergarten. Decisions based upon judgments can play an important role in a child's success in kindergarten and thus become an important factor in multiple year experiences.

Affective interventions in kindergarten and preschool are necessary elements of support for young children. Curriculum provided in those years can play a role in whether a child receives a multiple year experiences. In 2002, the Institute for Education Sciences began an evaluation of the effectiveness of 14 widely used kindergarten and preschool curricula (Preschool Curriculum Evaluation Research Consortium, 2008). Comparison groups were identified for each curriculum treatment condition. Children from treatment and control conditions were assessed to determine child level outcomes. Observers monitored fidelity to the curriculum protocols.

In preschool, only two of the fourteen curricula were found to positively impact outcomes. One of the two curricula was linked with an impact on literacy skills. In kindergarten, only three of the fourteen were found to positively impact outcomes. Each of these three curricula positively impacted literacy skills. Curricula in preschool and kindergarten can provide important literacy supports. However not all literacy curricula are linked to positive outcomes.

Mathematics skills and interventions as predictors. Most children enter kindergarten with basic mathematics skills and concepts (Griffin, 2007). They have a rudimentary understanding of quantity and can solve simple problems which require them to add or subtract. Skills in sorting, classifying and quantifying have been found to be related to early education experiences prior to kindergarten (Shonkoff & Phillips, 2000a). Some children enter kindergarten with few skills in mathematics and are at risk for failure. Approximately 35% of children will enter with low-average or low mathematics skills (Gersten, Clarke, & Mazzocco, 2007). Studies indicate that by third grade, 4-7% of children in the U.S. and internationally will be diagnosed with a mathematics learning disability (Fuchs et al., 2005; Gross-Tsur, Manor, & Shalev, 1996; Shalev, 2007).

The consequences of early mathematics difficulties can be seen throughout school and into adulthood (Jordan, Kaplan, O., & Locuniak, 2006). Early mathematics experiences have been linked to later success in mathematics across grades (Jordan, Kaplan, & Hanich, 2002). In addition, difficulties in mathematics skills have been negatively linked with overall school achievement and some social outcomes (Murnane, Willett, & Levy, 1995). Children from lower income families tend to be over-

represented in groups of children performing poorly in mathematics (Gersten et al., 2007). Specifically, children from low income households are four times as likely to perform poorly in mathematics tasks involving story problems which require children to coordinate language and mathematics skills and concepts (Fletcher, 2005; Fuchs et al., 2005). Kindergarten and first grade are particularly important times for intervention in this area (Jordan et al., 2002).

Significant differences in mathematics performance are seen at the beginning of kindergarten (Lee & Burkam, 2002). While most children make progress, the rates of progress tend to remain the same. This results in a gap in performance as children progress across grades. Understanding the predictors and elements of mathematics interventions are important for preventing later difficulties.

Gender differences are also seen as early as the beginning of kindergarten (Jordan et al., 2006; Royer & Garofoli, 2005; Royer & Wallace, 2007). Males and females in elementary and secondary education tend to have similar means on tests but show differences in the high and low ranges. Females tend to score higher than males in the low performing group. Males tend to score higher than females in the high performing group (Jordan, Hanich, & Kaplan, 2003).

Classroom instruction and individual tutoring have been studied as interventions to prevent failure in performance of mathematics (Fuchs et al., 2005). Instruction is guided by the initial needs of children and their response to the interventions they experience (Ginsburg, Lee, & Boyd, 2008). Carefully designed goals are linked to experiences and materials. Research based strategies are used to design experiences that have been shown to link to improved performance.

Fidelity to research based practices is important. Teachers often adapt curriculum to meet classroom needs. Griffin (2007) articulated five teaching strategies that must be embraced by teachers in order for any research based mathematics curriculum to be effective. The five strategies are:

- Begin instruction with real quantities. Continue to provide these opportunities until an intuitive sense of quantity develops.
- Provide many opportunities for use of oral language. Oral discussion provides a foundation for understanding.
- Start instruction where children are and teach concepts in the natural order in which skills and concepts are acquired.
- Support the use of natural strategies but teach children more formal problem solving strategies through modeling and pointing out systems for quantification (pointing to objects while counting.)

These strategies are based in research and provide a framework for instruction.

Most mathematics difficulties can be prevented through early supports and intervention (Ginsburg et al., 2008). Early intervention methods based on classroom and child level strategies have provided evidence of enhanced performance (Fuchs et al., 2005). Increases in performance have been seen for typically developing children as well as children who are considered to have mathematics learning disabilities. In addition, significant gains can be made by groups that have shown specific risk (ex. girls and children from low-income families.) (Ashcroft, Krause, & Hopko, 2007; Ginsburg & Pappas, 2007)

Early childhood education experience as predictors. Preventing disparities in school entry skills is one way to bolster success in later grades. Supports in preschool and early elementary school have demonstrated effectiveness in narrowing learning and achievement gaps for vulnerable children (Karoly, Ghosh-Dastidar, Zellman, Perlman, & Fernyhough, 2008; Loeb, Fuller, Kagan, & Carrol, 2004; Reynolds, Temple, Tobertson, & Mann, 2001) In a review of research by the National Research Council (2001), a quality early education experience was demonstrated to have a positive impact on school learning.

Efforts to provide supports to children before they enter school have shown promise in changing school outcomes. Children who receive high quality, comprehensive early education services in preschool tend to do well academically and socially in school and beyond. Follow-up evaluations of the Perry Preschool Project, Carolina Abecedarian Program and the Chicago Parent-Child Centers found that children in the programs scored higher on standardized tests and teacher ratings for academic and social achievement than peers who did not attend the programs after entering school (Campbel, Pungello, Miller-Johnson, Burchinal, & Ramey, 2000; Reynolds et al., 2001; Reynolds, 1995). Each of the programs evaluated contained specific academic and social supports targeted for children with multiple risk factors.

When children enter kindergarten with cognitive, academic and social challenges, they must receive appropriate instruction and intervention to find success later. If they do not, a wide range of physical, academic and social variables have been found to predict scores on tests and rating scales later. Likewise, scores on tests and rating scales administered in the early years tend to predict later achievement. Each appears in an

important, independent role in the variance seen among children at later grades. And, each interacts with the others to support school success, as measured by tests and ratings by teachers, parents and peers (Konold & Pianta, 2005; Mantzicopoulos, 2003a; Mantzicopoulos, 2003b; Pianta, Steinberg, & Rollins, 1995b).

Systems for early identification and intervention for vulnerable children have proven successful in changing trajectories of learning in early development and schooling. Many of the children who are most at risk for school difficulties do not receive early education services (Karoly et al., 2008).

Early school environments as predictors. Early experiences with specific qualities of the school and home environments have been found to relate to later success in school. Improved facilities, higher teacher salaries, more teaching assistant and education of families have been linked to school success (Wesley & Buysse, 2003). Some research has shown that the size of classes contributes to overall school success (Finn, Gerber, Achielles, & Boyd-Zaharias, 2001). The length of the preschool, kindergarten and first grade day has also been linked with later achievement (Finn & Pannocho, 2004).

Teachers play a pivotal role in understanding the needs of children and in turn providing instruction to promote the targeted behavior. Targets for learning are based upon observed behavior (Graue, 1993). The degree to which interventions and assessment strategies are seen as effective is determined by analyzing when and if the behavior changes and whether these changes are functional from setting to setting (Barnett, Bell, & Carey, 1999).

Multiple year kindergarten programs as prevention. Historically, the rate that children are retained in grade has been increasing since the mid 1980's (Lorence et al.,

2002; McCoy & Reynolds, 1999). In 1983, *A Nation at Risk* (National Commission on Excellence in Education, 1983b) was published and sounded an alarm about the low achievement of school children in the United States. This report was sponsored by the U.S. Secretary of Education and produced by the National Commission on Excellence. It painted a bleak picture of the status of children in the United States as compared to earlier years and as competitors in the world economy. The report blamed low expectations of Americans for the performance of children in school. As evidence, the report cited declining test scores, low education achievement and the cost of remediation to business, schools and tax payers.

Policies determining early school experiences were influenced by the calls for high standards and increases in retention as mechanisms for increasing performance. Retention increased in all grades in the 1980s but the largest and most sustained increases in retention during that period were in the kindergarten grade (Shepard & Smith, 1989). States began to write standards for the early grades, along with those written for later grades (Schwartz & Robinson, 2000). Throughout the subsequent decades, as policies moved toward requiring more accountability for outcomes, more and more children have been retained in grade (McCoy & Reynolds, 1999).

Calls for retaining children have continued. As recently as 1999, President William Clinton called for policy makers, parents and educators to embrace “tough love” and hold children in grade when they have not reached the targets of increased standards (Steinberg, 1999). States across the country were compelled to write standards and use tests to measure students’ progress toward them (Ravitch, 1995).

Large scale accountability systems were developed and implemented by states but decisions affecting individual children were and continue to be made at the local level. Parents, teachers and administrators continue to make decisions about whether to place children in multiple year programs. For many, retention in the early grades is seen as a form of early intervention (Silberglit et al., 2006). Retention in kindergarten specifically, is seen as a method of providing supports before children fail (Shepard, 1989).

The debate about the effectiveness of retention in improving outcomes for children is complex and evolving. The crux of the issue is whether to pass children to grades for which children are believed to be unprepared (social promotion) or to give them another chance to learn the content while repeating the grade or a variation of the grade (Hauser, 2001). Research has yielded inconsistent results when examining the effect of multiple years in kindergarten on social and academic achievement (Jimerson et al., 1997).

Several systematic reviews and meta-analyses of research have been conducted since the early 1970s. Each study set standards of quality for acceptance and each analyzed effect sizes. Cumulatively, these studies describe inconsistent findings in the analyzed studies. However, the bulk of the findings do not support multiple year experiences as an intervention to prevent failure.

Jackson (Jackson, 1975) analyzed studies spanning years 1911 – 1973 to examine the efficacy of retention. Studies were broken into three categories: naturalistic, pre-post design and experimental. Jackson found statistically significant differences favoring promoted students in academic achievement, learning related skills, and self concept. Retained students were found to have lower academic skills, poorer personal adjustment

and lower self concept. In addition, retained students were perceived less favorably by promoted students. He concluded that there is no evidence that grade retention provides more benefits than promotion.

Holmes & Matthews (1984) conducted analyses of studies published between 1929 and 1981. Using a meta-analysis strategy, these researchers explored the effects of retention for elementary and junior high school students on academic achievement and socio-emotional outcomes. Statistically significant results were found favoring promoted students for language arts, reading, mathematics, work study skills, social studies, personal adjustment, social adjustment, emotional adjustment, behavior, self-concept, attitude toward school and attendance. They concluded that cumulative evidence shows negative effects for retention.

Holmes extended the meta-analysis to include studies between 1925 and 1989. The resulting analysis included 25 studies with matched subjects (Holmes, 1989). Fifty four studies were found to report negative results associated with retention. Nine studies reported positive effects. In all of the nine studies, benefits were seen to diminish over time. When only studies with well matched samples were considered, greater negative outcomes were observed. Holmes concluded that the bulk of evidence does not favor retention.

Jimerson reviewed studies conducted between 1990 and 1999 to examine the efficacy of early grade retention (Jimerson, 2001). This meta-analysis reviewed studies representing over eleven hundred retained students and fifteen hundred promoted students. Children in these studies represented diverse geographic regions across the country. Key criteria for inclusion in the analysis were that a comparison group of

promoted students needed to exist and students needed to be matched on two or more variables. Eighteen studies met the criteria. Of these studies, sixteen reported negative effects for achievement and adjustment. Overall, the retained group scored .39 of a standard deviation below that of the comparison group.

While these four systematic reviews of research tend to favor promotion, Alexander and colleagues argue that analyses of specific studies are less convincing (Alexander et al., 2003; Jimerson et al., 2006). For example, these researchers note that of the 163 studies analyzed by Jimerson (2001), 84 comparisons did not find significant differences between retained and promoted students. Alexander et al. agree however, that for the studies by Jimerson, Holmes, Holmes and Matthews, and Jackson in which significance was found, the majority favor promotion.

More recently, Lorence, Dworkin, Toenjes and Hill (2002) report positive results for retained students in Texas. Lorence and his colleagues examined third grade scores on the Texas Assessment of Academic Skills (TASS) for retained and promoted students. This analysis revealed that retained students scored significantly lower on the third grade TASS. After being retained, 70% of the students passed the third grade TASS the second time. Retained and socially promoted students demonstrated a trend of increasing scores through fifth grade. Retained students increased scores at a faster rate than socially promoted students. By the fifth grade, students retained in third grade began passing the third grade reading test. On average, promoted students with low TASS scores in third grade did not achieve passing scores until sixth grade, the same year that the retained students passed. Lorence et al. concluded that retention in third grade did not appear to harm later performance. Both socially promoted and retained students eventually passed

the test with retained students making relatively more progress than socially promoted students.

Karweit (1999) analyzed data from the Prospects Study, a longitudinal study designed at the time of the reauthorization of Chapter I/Title I in 1988. Data for children entering first grade in 1991 were followed for 3 years. Low achieving students who were retained were matched with low achieving students who were promoted. The analysis controlled for family variables and prior achievement history.

Karweit developed two types of comparisons. First, gains in performance of retained students were compared to their performance at the end of the retained year. Second, performance of retained students was compared to promoted students of the same age. Results varied depending on the comparison group. Karweit found no positive results when retained students were compared to promoted students of the same age.

Positive effects were found when performance for retained children was compared to their performance in retained grade. This difference was strongest for the retention year but decreased significantly subsequent years. Gains were greater for retained student in the retained year but retained students did not catch up. Karweit stated that, "These gains come at the cost of spending a year longer to get to not quite the same place" (p. 40).

Karweit extended the analyses of the Prospects data to determine whether there were patterns of difference on teacher ratings of attention, cooperation and participation for retained and promoted students. Both same age and same grade comparisons were conducted. No difference was found for cooperation or participation for any comparison. Differences were found for attention with retained students rated lower for attention in

the year prior to retention. Differences were significantly reduced after the retention year though differences remained.

Methodological issues

Research methods used in multiple year kindergarten research may themselves play a role in the results found in studies of retention. Karweit (1999) described three predominant methodological issues in research on retention. First, the type of design can favor a research outcome. Second, whether the comparisons are based upon children of the same age or children of the same grade tends to bias the findings. Finally, the lack of information about the instructional elements of both comparison and experimental group make understanding findings difficult.

The type of design used to study the effects of retention predictably affects the outcome of the research. Jackson (1975) described three design types and their corresponding tendencies. The first design type compares promoted students to retained students after retention. This type favors promoted students. The second design type compares pre and post retention outcomes for retained students. This type tends to favor retention. The third design type uses an experimental design and randomly assigns students to repeat a grade or to be promoted. Jackson reports three studies of this type and that results are insufficient to be analyzed.

The type of comparison group used in retention studies can influence the results. In general, research on kindergarten retention has examined children who are old for their grade and compared them to either their same aged peers *or* to their same grade peers. The selection of the comparison group itself may contribute to the results of the study (Jackson, 1975, Karweit, 1999.) Studies that compare children who have been retained

with children who are their same age but have been promoted to next grade are considered same age studies. These studies tend to favor promoted students. Studies that compare retained students to their progress in the retained grade and with their peers in that grade are considered same grade studies. These studies typically favor retention. Meta-analyses typically do not distinguish between same age and same grade comparisons when calculating effect sizes. Karweit (1999) and Shepard (2000) conclude that same grade comparisons are more relevant for understanding the effects of interest for parents and teachers.

Another methodological issue in understanding retention is the variation of instructional support children receive in any particular grade (Early, Pianta, & Cox, 1999). Research examining the structure and instructional supports found in kindergarten classrooms to vary considerably classroom to classroom. In one analysis of types of instruction found in typical classrooms, researchers found that whether teachers provided teacher led learning activities, small group learning activities and free time varied between classrooms from 0-100 percent (Pianta & LaParo, 2003; Pianta et al., 2002). Similar results were found in an examination of first grade practices when comparing the types of methods used for teaching academic (NICHD-ECCRN, 2002). Typically, little is known about the actual experiences children receive when retained. This is particularly true with kindergarten retention.

In addition the three methodological issues described above, Hauser, Pager, and Simmons (2004) identified the lack of specific national, state and local data regarding retention as problematic. Research on retention has tended to lump all forms of multiple year kindergarten programs together (Shepard, 2004). Much of the study of retention has

been termed “age-grade retardation” (pg. 98, Hauser, Pager, & Simmons, 2004). Using this method, researchers identify children who are older than the modal age for the grade under study. Researchers infer that a child has been retained when the age of the child is older relative to others in the grade. While all states do not require kindergarten, all states offer kindergarten. The date by which children are deemed eligible for kindergarten entrance varies from state to state. All states require that children turn five by a predetermined cut point. Relative ages are determined by how states and districts define eligibility.

The age of children as they enter kindergarten varies from state to state and district to district. For most states, children are eligible for kindergarten if they turn five years of age between August and January. Two states allow districts to select from two predetermined cut dates. Five states allow individual districts to determine the date that children become eligible to enter kindergarten (National Conference of State Legislatures, 2007). Modal ages of children in particular grades vary due to the variation of eligibility requirements.

In addition to the variations in age due to differing eligibility requirements, some children wait a year beyond the date specified to start kindergarten. This practice has been called “red shirting.” Approximately 5% of kindergarten eligible children delay starting one year (Alexander, Entwisle & Duber, 2004). Caucasian, upper middle class, males make up the majority of children who experience delayed entrance. Comparisons based upon the ages of kindergarten children in particular grades must account for children who are older because entrance was delayed.

When meta-analysis of retention studies identify children based upon their age in their grade, comparisons across states and districts pose methodological challenges. Most large scale reviews and meta-analyses of the effects of retention average effect sizes across many studies. Given the variability of a child's age in kindergarten, averaging results across states and districts can be misleading.

As noted earlier, parents, teachers and school principals use multiple year kindergarten experiences as a method to prevent early failure. The belief is that many children need time to mature or more time with kindergarten curricula in order to “catch up” with their peers. Research does not support the premise that multiple year programs consistently prevent school failure. While some studies suggest that early retention is a preventative intervention, most studies reveal a pattern of no difference or negative effects. And with little data regarding the content of instruction for the kindergarten year, it is difficult to analyze predictors beyond demographic and family variables for multiple year experiences. For this reason it is important to examine variables of interventions that prevent subsequent failure.

Given the lack of information about the actual experiences of children multiple year programs, it is possible that specific classroom interventions may better predict retention and later success for kindergarten children. The sections below describe current research in interventions to support social, literacy and mathematics skills in the early years.

Summary and need for this research

To accurately understand variables that predict which children receive multiple year kindergarten programs it is essential to know specific information about the children who have spent more than one year in kindergarten. To date, most research on

Multiple year kindergarten experience

kindergarten retention has been based upon analyses of data based upon children who are old for their grade. Undoubtedly children who entered kindergarten late or early are included in this analysis. Because of this, the true impact of predictors for retention and other multiple year assignments has been confounded.

The research described in this dissertation is based upon data gathered from parents and assessments for children whose parents indicated that they have experienced more than one year in kindergarten. Thus, predictor variables identified are more accurate. Given the concern about the consequences and cost of multiple year school programs, understanding predictors allows parents, educators and policy leaders to more accurately develop targets for intervention.

CHAPTER 3
METHODOLOGY

Introduction

The present study involves analyses of the Early Childhood Longitudinal Study-Kindergarten Cohort extant data base. The procedures employed by ECLS-K researchers described in this chapter include sample selection, data collection, training of data collectors, determining reliability and error and establishing sample weights. Procedures described below and employed in this study include establishing sample size, power and significance, data analysis and data preparation.

The first section of Chapter 3 will state the research question. The second section will describe the procedures used by ECLS-K researchers to select the sample for the study. The third section will describe ECLS-K procedures to establish reliability of the data collected. The fourth section will describe the methods in the current study to identify sample size, power and significance levels. The fifth section will describe the statistical methods used for analyses in this research.

Research Question

Do differences in family characteristics, student demographics or early scores of mathematics, reading, and cognition predict which children will experience multi-year kindergarten programs and which will not?

Participants

The full extant data set includes information for 21,260 children entering kindergarten in the 1998-1999 school-year. Kindergarten children were sampled using a

multistage probability strategy. The sampling frame was multipurpose with three, nested sampling units: geographic units, schools within geographic units and students within schools. Sampling was designed to create a representative sample of each unit. The analytic sample for this study consists of 15,396 children.

The three units were sampled in stages. The primary sampling units were geographic areas based upon counties or groups of counties in the first stage. The second stage of the sample selection identified schools within the sampled primary units. The third stage sampled students within the targeted schools. The samples for children and classrooms were configured so as to represent the population of children and kindergarten classrooms nationally.

Region Sampling. The data used for determining the primary sampling units were based upon a 1990 Metropolitan Statistical Area map that outlined census groupings. This information was updated with 1994 data of population estimates of five year olds by race and ethnicity. Asians and Pacific Islanders were over sampled. Primary sampling units were configured to assure that each had a minimum of 320 five year olds. Once this was done, 1335 primary sampling units existed. 100 primary sampling units were subsequently selected for the study.

The 24 largest primary sampled units were selected for the study. In addition to these 24, the remaining units were partitioned into 38 strata. These were sorted by eight super strata and then by the Metropolitan Statistical Map and by Census region. Further stratification was completed for race, ethnicity and per capita income.

School Sampling. Public and private schools with kindergarten classrooms were sampled. The 1995-1996 Common Core of Data file and the 1995-1996 Private School

Universe Survey were used as sources for sampling schools. The Bureau of Indian Affairs was consulted and a listing of Department of Defense schools was used in the sample. 911 public school records and 12,412 private school records were obtained. Schools were updated to include those newly operating schools in 1998.

Within the targeted sample, public schools with fewer than 24 students and private schools with fewer than 12 children were excluded. Schools were selected based upon the probability that they would be proportional to size. A target number of schools was determined for each primary sampling unit. The number was set proportional to the size of the primary sampling unit. A minimum of one school was set for each primary sampling unit.

Within each of the 100 public school primary sampling units, schools were ranked by size and partitioned into three classes of similar aggregate measures of size. Within each class, schools were sorted by proportion of Asian and Pacific Islander population. Private schools were sorted by primary sampling unit and by affiliation (religious or nonsectarian). Schools were then sorted by size. The selection of both private and public schools was proportionate to the probability of size. A total of 1280 schools were selected. 934 of the selected schools were public schools. 346 of the selected schools were private schools. Schools were updated with lists in 1998.

Child and parent sampling. Once the schools were identified, children in kindergarten classrooms were selected. Children were selected randomly based upon the proportion of the gender, race and ethnicity within the school. The sample was self weighted to determine the minimum required for each targeted subpopulation. Twins and students listed as Pacific Islanders were over sampled in the data for potential later analysis.

Two substrata were formed. First, a substrata containing Asian and Pacific Islander students were aggregated. Everyone else in the kindergarten program made up the second substrata. Twins were sampled as one unit. Asian, Pacific Island students and twins were over sampled to allow for independent research on these groups.

After sampling was completed for children, parents and teachers of the children were identified. Parents and teachers in the study were determined in the fall of 1998 and then refreshed in the spring of 1999. Parents were 18 years of age or older and living with the child.

To strengthen response rates, a focus group was convened to identify reasons families may refuse to participate in the study. Information gathered in the focus group was used to train field staff to minimize refusals in the study. A special attempt was made to identify parents who refused to participate and to gain their permission. Additional mailings and school visits were also used.

Response rates. The nested sampling design yielded three levels of participants: regions, schools and children. From this original pool, 69.4 percent of schools agreed to participate. Substitute schools were recruited to increase the response rate in primary sampling units (regions) where sampling was low. Substitutions were based upon

similarity to the original school. After substitution, the number of cooperating schools increased from 879 to 953.

The primary analytic focus for the ECLS-K research was children. Completion rates were calculated for children. Data analyzed for this dissertation were obtained from two sources: child assessment and parent interview. Weighted completion rates for assessments were 89.9 percent. Weighted completion rates for the parent interviews were 85.3 percent. These percentages include data from substitute schools. Completion rates were similar for all categories of sampled schools (e.g. 90.2 for private and 89.9 for public). Completion rates were also similar for most child characteristics. One exception was the completion rate for Asian and Pacific Islander parents whose response rates were 74.1 percent compared to 85.3 percent for parents overall.

Data Collection

Data collected from the fall of the base year of the ECLS-K (1998) and used in this study include direct child assessments, parent rating scales and parent interview information. Data were entered into either computer-assisted personal interviewing for the results of the direct assessment. Parent interview data were entered into the computer-assisted telephone/personal interviewing system. Most parent interview data were collected over the telephone. In the circumstances where parents were not available by phone, face to face interviews were conducted.

Assessments and parent interviews were conducted over a three month period at the beginning of kindergarten, 1998. Attempts were made to conduct child assessments early in the year so that the impact of instruction would be minimized. Children who were believed to need language support or other type of accommodation were identified

at the first visit. Overall, 15 percent of children were assessed using the OLDS. In addition, 88 children were excluded due to disability status. Assessments were conducted for 182 children who required accommodations to participate. Interviews took slightly longer and received specific efforts described below to increase response rates.

Data analyzed in this study were gathered through parent interview and direct assessment of children in the fall of 1998. Specifically, general knowledge, literacy, quantitative skills, height and weight were gathered through direct interaction with children. In addition, parents provided demographic, family background and income information through interviews. Parents also completed ratings of children's social and self control skills. These sources of information provide a picture of the child's early skills and background for this study.

Parent Interview. Parent interviews were conducted from September 1998 to January, 1999. Each interview averaged 50 minutes. In most cases, the interview was conducted over the telephone. Approximately 3 percent of the interviews were conducted in person. Most interviews were in English but Spanish, Lakota, Hmong and Chinese interviews were also conducted. One percent of parent interviews were not conducted due to language differences. Approximately 94 percent of the interviews conducted in a language other than English were conducted in Spanish.

A special effort was made to obtain high rates of response for the parent interview. Training was provided to field staff to convert refusals. Focus groups and telephone conferences were convened to determine common barriers to participation and develop strategies to convert. An incentive (Learning Partners—A Guide to Educational

Activities for Families) and endorsement letters were mailed to the home. Specially trained staff worked with parents who refused to participate.

The child's mother was the parent most often interviewed for this study. The respondent was required to be 18 years old, knowledgeable about the child and living in the household with the child. Other types of relationships of interviewees included father, stepparent, adoptive parent, guardian, grandparent, or another relative.

Through interview, parents were asked to rate their child's social skills. Items were adapted from the Social Skills Rating Scale (Gresham & Elliott, 1990.) Specific to this research, parents completed ratings for social interaction and self control. Parents rated children on a four point scale with one indicating "never" and four indicating "very often." Split half reliability for both scales was .74 for Self-Control and .74 for Social Interaction. The Social Interaction scale contained three items related to the child's ability to interact with children and adults. The Self-Control scale contained five items related to children's ability to control their own behavior.

Direct Child Assessments. Direct assessments of children took place in the fall of 1998. Each assessment took approximately 50-70 minutes. Items making up the assessments were taken directly from commercial assessments and are under copyright protection. Specifically, items were borrowed and adapted with permission from the following assessments: Peabody Individual Achievement Test-Revised (PIAT-R), Peabody Picture Vocabulary Test-Revised (PPVT-R), Primary Test of Cognitive Skills (PTCS), Test of Early Reading Ability (TERA-2), Woodcock-Johnson Tests of Achievement-Revised (WJTA-R). Items are not available for review.

Assessments were conducted outside of the classroom. Assessors set up the room prior to assessment and followed prescribed procedures. Assessors verified the child's identity and provided warm up exercises similar to items found in the assessment. A language screening instrument was administered to children who had been identified by the school as coming from a language minority background. The Language and Literacy and General Knowledge assessments were designed to be administered in English. The Mathematical Thinking assessment and the warm-up booklets were translated into Spanish.

The Language and Literacy assessment was designed to measure receptive vocabulary, basic literacy skills (concepts of print, letter recognition, alliteration, rhyme, word recognition) and comprehension (listening and words in context). Comprehension items measured skills in understanding, developing interpretation, personal reflection and critical stance. The Alpha Coefficient was measured at .86.

The Mathematical Thinking assessment includes measures of conceptual knowledge, procedural knowledge and problem solving. Half of the items in the assessment were designed to measure number sense, number properties and operations. The remaining half of the instrument assessed skills related to measurement, data analysis, patterns, algebra and functions. Items included open ended questions, multiple choice questions and use of manipulatives. The Alpha Coefficient was .78.

The General Knowledge assessment measured skills and knowledge related to science and social studies content. Science content focused on conceptual understanding of scientific facts and skills and abilities to form questions about the natural world. Social studies content included history and government, culture, geography, and

economics. Questions required children to answer based on their experience. The Alpha Coefficient was .79.

Scores from the Language and Literacy, Mathematical Thinking and General Knowledge assessments used in this research are standardized T-scores. They are norm referenced achievement scores designed to compare children in the study with the population as a whole. These scores have a mean of 50 and a standard deviation of 10. Standards scores were derived using cross-sectional sample weights. Assessments were administered in the fall of the base kindergarten year giving a point in time measure of a child's performance relative to the population.

In addition to direct assessments of cognition, assessors weighed and measured the children. A Shorr Board was used for measuring height and a digital bathroom scale was used for measuring weight. Height and weight measurements were collected at the time of the cognitive assessments.

Training of assessors and interviewers

Field staff employees were recruited from individuals who had been involved in previous national education studies. Most were former educators or experienced assessors. Assessors were trained in August and September of 1998. Training took place for five days. Approximately 30 hours of the training focused on establishing rapport, maintaining neutrality, and standard administration of the assessments. Trainees practiced administering the assessments on kindergarten eligible children who were not participating in the study. Spanish bilingual assessors trained for an additional five hours in order to administer the Spanish Oral Language Development Scale (OLDS).

Parent Consent

ECLS-K field staff collected implicit and explicit parent consent. The type of consent depended upon the policies of participating schools and districts. Across the study, the type of consent was divided approximately in half with one half requiring implicit and one half requiring explicit. Information packets were mailed to homes. Consent forms were mailed along with the study information. More time was allowed for collecting explicit consent forms. On average, four phone calls were made to the homes to gain consent.

Data Reliability

It is important that the data gathered in research be reliable. Error in research can generate biased results that lead investigators to inaccurate estimates and inferences. There are two potential sources of error in all research: non-sampling error and sampling error. In order to make appropriate inferences, methods must be undertaken to reduce error.

Non-sampling error. The term non-sampling error is used to describe error that is produced by the research design and methods but is not based on the sampling itself. Types of non-sampling error include coding errors, reporting errors, computer programming errors, and non-response. ECLS-K researchers reduced non-sampling error through training, supervision, and instrument design. In addition, statistical methods were used to weight for non-response.

Respondent bias takes place when respondents answer questions in ways that are misleading or inaccurate. One common form of respondent bias takes place when respondents provide answers they believe are socially desirable. Minimizing this type of

bias would be particularly important for analyses of parent interviews and child assessments.

In order to reduce social desirability bias, the ECLS-K interview was designed to increase the reliability of the responses. Particularly critical questions were asked more than one time. In addition, more types of respondents were asked the same question. When discrepancies were found, attempts were made to verify data. One example where responses were verified related to experience prior to kindergarten. If Head Start was identified as a pre-kindergarten experience, Head Start enrollment was verified through Federal records.

In order to adjust for non-response, weights were developed to assure that no category of response or responder was over or under represented in the totals. If some groups of children or parents systematically respond in greater or fewer numbers than their proportion in the population, estimates and inferences would be biased. Weights reduce this likelihood by creating response rates that are in proportion to the population of kindergarten children in the 1998-1999 school year. Methods for developing weights will be described below.

Assessment instruments in the ECLS-K are another source of potential error. Assessments of young children can be unreliable depending upon characteristics of children, assessors, assessments and assessment conditions (Meisels & Atkins-Burnett, 2006). The ECLS-K research team took steps to minimize variability due to test administration, and assessment conditions. All tests were administered outside of the classroom. This condition assured that children would not be distracted by ambient

sound. In addition, all assessments were un-timed. Children were not rushed to complete assessments.

Assessors were trained to assess children as described above. Protocols were established that required specific assessor performance. Field supervisors monitored assessment to assure fidelity to protocols. Field supervisors also provided checks on coding and data input. Assessment training and data coding and input training were refreshed as necessary. Non-sampling error was reduced due to these measures. Teams of data checkers reviewed collected data.

Sampling error and weights. The ECLS-K data are intended to be used for multiple purposes. As such, the data represent a complex design which over sampled some subgroups. For example, twins, private schools and children of Asian or Pacific Rim decent were over sampled. In its raw form, the proportions of subgroups of children do not sum to those of the total population. Using raw data would lead to inaccurate inferences and estimates.

In addition to the intentional over sampling of subgroups, some amount of random sampling error is expected. This error is derived from the sampling activity itself. Many random samples can be generated from any given population. Sampling error represents the variability obtained from those samples.

The greater the variability in the sample, the probability of making inaccurate predictions and inferences with raw data alone is higher. To decrease sampling error in this research, jack knife replication procedures were used to produce more accurate estimates of the sample. The jack knife method allows for the calculation of error by producing 90 replicate samples. Estimations are calculated and compared for each set.

This method reduces the likelihood for large sampling error. This is necessary to conduct tests of significance or make predictions.

ECLS-K research developed sample weights to readjust for oversampling and sampling error. Weights enable the proportion of children to be more in line with the population of children entering kindergarten. Weights adjust for the probability of being selected for the sample. Weights were assigned to the primary sampling unit equal to the inverse of the probability of selection. Then, weights were assigned to schools. The weight of the school was calculated by multiplying the inverse of the probability of selecting the school by the PSU weight. Base weights were adjusted for non-response. Base weights for children were calculated by the school non-response weight multiplied by the total number of students in the school divided by the number of students in the school sample. Parent weights were calculated by adjusting the child weight for parent non-response. Extant sample weights were then used in the current study.

Sample Size, Power, and Significance

It is important to establish the sample size necessary for the statistical analysis a priori, while considering the power, population effect size, and level of significance. As Cohen writes,

“Statistical power analysis exploits the relationships among the four variables involved in statistical inference: sample size (N), significance criterion (α), population effect size (ES), and statistical power. For any statistical model, these relationships are such that each is a function of the other three. For example, in power reviews, for any given statistical test, we can determine power for given α , N, and ES. For research planning,

however, it is most useful to determine the N necessary to have a specified power for given α and ES..." (Cohen, 1992c)

Since sample size requirements for a binary logistic regression have been determined for the purposes of this study, it is also necessary to determine an acceptable significance level for determining when to reject the true null hypothesis (i.e., the probability of committing a Type I error). The standard values for significance level represented by α are set at 10%, 5%, and 1% as a matter of policy (Aczel & Sounderpandian, 2008; Aczel & Sounderpandian, 2005). This means that an $\alpha = 0.05$ corresponds to $(1 - \alpha) = 0.95$ probability of a correct statistical conclusion when the null hypothesis is true (Lipsey, 1990). Additionally, a 0.95 probability is equivalent to a 95% confidence level to reject the hypothesis (Aczel, et al, 2008). For the purposes of this research, the level ($\alpha = 0.05$) will be chosen for the analysis which is the most commonly designated value in social science research for this parameter (Lipsey, 1990).

Statistical power is also an important factor to consider a priori. As defined by Cohen, "The statistical power of a significance test is the long-term probability, given the population ES, α , and N, of rejecting a false null hypothesis. When the ES is not equal to zero, the hypothesis, is false, so failure to reject it also incurs an error. This is a Type II error," (Cohen, 1992a). Power is the probability of rejecting the null hypothesis if the null hypothesis is really false. An acceptable level of power for this study is 0.80, making the Type II error $\beta = .20$ (4 times as likely as the Type I error). Since it is typically more serious to make a false positive claim than it is to make a false negative one, this is an acceptable level and will be considered in determination of the sample size a priori (Cohen, 1992b).

Choosing an effect size indicates how small of a difference to accept in order for the results to be determined significant. If allowing a very small effect size, then a large sample is required. If requiring large differences, then a small sample size is required. The larger the effect size, the greater the power of the test. A medium effect size ($\beta=.10$) has been determined as appropriate for this study and has been used in the determination of the sample size. This is considered an average effect and is appropriate for the analysis.

In general sample size calculations for logistic regression are complex. The sample size calculation for logistic regression with one 0/1 independent variable is presented, which is equivalent to comparing 2 proportions. Thus, the formula used is:

$$N = (Z_{1-\alpha/2} * \text{sqrt}(P*(1-P) + Z_{1-\beta} \text{sqrt}(P1*(1-P1) + P2*(1-P2)) / [(P1-P2)^2]$$

(Selvin, 1996) where $Z_{1-\alpha/2}$, $Z_{1-\beta}$ are the standard normal Z-values, P1 is the event rate X = 0, P2 is the event rate for X=1, and $P = (P1+P2)/2$ is the total event rate. This research uses a power of $1-\beta = 0.80$ and a level of significance of $\alpha = 0.05$. Using this formula, the necessary sample size to achieve empirical validity for this study (using $P1=.04$ and $P2=.08$) is approximately 600 in each group for a total of 1200 children.

Data Analysis

Data were entered into SAS 9.1.3 for Windows and all statistical analyses were also done in SAS. Due to the sample design and the use of weights, the survey procedures in SAS, namely SURVEYMEAN, SURVEYFREQ, SURVERYREG, AND SURVERYLOGISTIC were used. The ECLS-K provided sample weights (C1PW0)

were also used to account for over sampling, sampling error and missing data.

SURVEYFREQ was used to obtain the frequencies of yes/no, while

SUREVYLOGISTIC was used to obtain the corresponding odds ratio.

For categorical variables the reference was usually taken to be the largest category. SURVEYMEANS was used to obtain the means and standard deviations for yes/no, while SURVEYREG was used to obtain the corresponding p-values. Finally, SURVEYLOGISTIC was used to perform backward logistic regression to obtain the final model using both categorical and continuous variables. A significance level of 0.05 was used. For a categorical variables the odds ratio gives the ratio of the odds of the given category versus the reference category. For a continuous variable the odds ratio gives the odds ratio for a 1 unit increase of the continuous variable. The odds ratio for a 10 unit increase is obtained by raising the odds ratio to the 10th power.

The tables below describe the variables to be studied. In all, 22 variables were entered into the model. There were 14 student and 8 family variables. Five of the student variables were continuous variables. One of the family variables was a continuous variable. All others were categorical. Variables are listed in table 3.1 below.

Table 1

Student variables

Variable	Description	Variable Type
Gender	Gender categorized as male or female	Dichotomous Categorical
Race	Race of child categorized into 8 categories.	Categorical
Disability status	Whether or not the child has a disability	Dichotomous Categorical (y/n)
Hours spent in out of home care	Average weekly hours spent in out of home care prior to kindergarten	Continuous
When enrolled	Whether the child was enrolled on time, early or delayed for kindergarten as per the district policy	Nominal
BMI	Calculated using the weight and height of the child	Continuous
Height	Height of child at the beginning of kindergarten	Continuous
Birth Status	Classification of number of children born at time of focal child-- Single or other	Categorical
Child's age at K entry	Child's age in months at first entry to kindergarten	Continuous

Table 1 (continued)

Student variables

Variable	Description	Variable Type
Self Control Rating Scale	Parent completed five point rating scale	Continuous
Social Development Rating Scale	Parent completed five point rating scale	Continuous
Early Reading Assessment	Standard score with mean of 50 and standard deviation of 10	Continuous
Mathematics Assessment	Standard score with mean of 50 and standard deviation of 10	Continuous
General Knowledge Assessment	Standard score with mean of 50 and standard deviation of 10	Continuous

Table 2

Family variables

Variable Name	Description	Variable Type
Primary home language	Classification of whether child's primary language is English or not. Composite of 6 survey questions regarding language	Dichotomous Nominal English/Non-English
Family type	Whether there are two parents in the home or another type of family structure	Dichotomous Two parent/Other
Mother's expectations for child	Levels of academic achievement mother expects	Nominal
SES-continuous	Combined variable derived from logarithm of mother's occupation, occupation prestige score, father's occupation and prestige score, household income based on size of family and 1998 census poverty threshold	Continuous
Mother's education level	Mother's education levels	Categorical
Poverty status	Whether the family is at or below the Federal poverty level during the kindergarten year	Dichotomous (y/n)

Table 2 (continued)

Family variables

Variable Name	Description	Variable Type
Mother's age at first birth	Mother's age in years at the time of her first birth	Continuous
SES-categorical	Combined variable derived from logarithm of mother's occupation, occupation prestige score, father's occupation and prestige score. Results grouped into quintiles.	Rank order

Descriptive statistics in this study include frequency and percentages for nominal (categorical/dichotomous) data and means/standard deviations for continuous (interval/ratio) data. Standard deviation measures statistical dispersion, or the spread of values in a data set. If the data points are all close to the mean, then the standard deviation is close to zero.

To examine predictors of multiple year kindergarten experience, program (yes vs. no) a logistic regression was completed. A logistic regression is used when the criterion variable is dichotomous. Parents were asked whether the 1998 school year was the child's first year in kindergarten. The criterion variable for this study is whether or not the parent answered 'yes' or 'no' to that question. A backward, multiple logistic regression was conducted.

Tests of significance were conducted using Wald Chi-Square test of independence. This analysis is used to explore the significant contribution of each coefficient in the logistic model. The Wald test value provides information about the amount of change in prediction expected when the variable is added to the model. Coefficients close to 0 indicate that little variance has been added by the variable. The Wald test provides information about the likelihood of the coefficient being statistically different than 0. Statistical significance will be reported as *p*. values.

CHAPTER 4

RESULTS

Introduction

To analyze whether differences in family characteristics, student demographics or early scores of mathematics, reading, and general knowledge predict whether children will experience multi-year kindergarten programs, descriptive, univariate and logistic regression statistical procedures were conducted. The statistical analyses are organized into four sections. First, descriptive data are presented to provide information about the demographic sample. Second, statistical significance of the relationship of child variables to kindergarten experience is provided. Third, statistical significance of the relationship of child family variables to kindergarten experience is provided. Finally, results of a multiple logistic regression are provided.

Frequencies and percents of subgroups

The analytic sample included 15,396 subjects. Approximately 95.65% of the children in the sample were entering kindergarten for the first time and 4.36% were not. Parents provided information regarding kindergarten experience. This variable was the criterion variable upon which tests of significance and logistic regression were performed.

All categorical predictor variables were composed of two or more subgroups. The numbers of subgroups ranged from two (gender) to five (race). For ease of

analysis, the categorical variables were divided into student variables and family variables.

Descriptive data for student categorical variables are summarized in Table 1. Data for student categorical variables were collected through parent interview and a review of school records in the fall of the 1998 kindergarten year. Kindergarten experience, gender, race, disability status, birth status and enrollment status were analyzed. Each of these variables had subcategories that resulted in a total of seventeen student related categorical variables in the analyses.

The variable ‘If Enrollment Early or Delayed’ was asked to determine whether children entered when they were eligible by district policies, whether they enrolled earlier than prescribed by district policies or whether they entered later than district policies would indicate. Parents indicated that 9.49% did not enter kindergarten at district determined entry times.

Table 1

Frequencies and Percents for Student Categorical Variables

	N	%
Kindergarten experience		
First time in K	14727	95.65
Not first time in K	671	4.36
Gender		
Female	7593	49.32
Male	7803	50.68

Table 1 (continued)

Frequencies and Percents for Student Categorical Variables

	N	%
Race		
White, Non-Hispanic	9559	62.09
African American	2308	14.99
Hispanic (Specified and Non-Specified)	2009	13.05
Asian	823	5.35
Other (Native Hawaiian, Pacific Islander, American Indian, Alaska Native, More than one race)	697	4.53
Disability		
Has no disability	13213	85.82
Has a disability	2183	14.18
Birth status		
Single birth	15011	97.50
Multiple birth (Twin and higher)	385	2.50
When enrolled		

Multiple year kindergarten experience

When old enough per district policy	13935	90.51
Waited	1137	7.39
Entered early	324	2.10

Descriptive data for family categorical variables are summarized in Table 2.

Overall, six family categorical variables were used in the analysis. Family type, academic expectations for the child, family home language, SES, mother’s education and family poverty level were included. Including the subcategories, nineteen family variables were examined.

Table 2

Frequencies and Percents for Family Categorical Variables

	N	%
Family Type		
Two parents	11903	77.31
Other	3493	22.69
Expectations for Student		
Bachelor degree	7573	49.19
Graduate degree and above	4210	27.34
Some college	2226	14.46
High school or less	1387	9.01
Home Language of Student		
English	14301	92.89

Multiple year kindergarten experience

Non-English	1095	7.11
SES		
Fifth quintile	3660	23.77
Fourth quintile	3416	22.19
Third quintile	3221	20.92
Second quintile	2904	18.86
First quintile	2195	14.26

Table 2 (continued)

Frequencies and Percents for Family Categorical Variables

	N	%
Mother's Education		
Bachelor's degree	2606	16.93
High school diploma or below	6249	40.59
Some college	5214	33.87
Graduate degree	1327	8.62
Poverty		
No	12978	84.29
Yes	2418	15.71

Descriptive data for continuous variables are summarized in Table 3. Data were analyzed for eleven continuous variables. Five of the eleven variables were measured

through direct assessment. The General Knowledge, Mathematics and Reading scores were designed with mean of 50 and a standard deviation of 10. The mean for this sample ranged from 50.38 to 51.05. Mothers rated children's social skills and self control skills using a five point scale. Means ranged from 2.82 to 3.36. Parent rating scores were important for understanding the relationship of kindergarten entry non-academic skills to multiple year kindergarten experiences.

Students' height and weight were measured at the same time as the direct assessments. BMI was calculated by combining height and weight. These variables are important to the analysis since some research has linked them to kindergarten retention (Rouse & Fantuzzo, 2007; Shepard, 2004).

Some research has linked youngness of mothers to academic difficulties of children (Pati et al., 2009; Wertheimer, Croan, Moore, & Hair, 2003). In the overall sample, the average age of the mothers at the birth of their first child was 23.51 years. The analysis of this variable will provide information on the relationship of Mothers' Age at First Birth to kindergarten experience.

The average age for students entering kindergarten in the sample was slightly greater than 5.5 years. Research on "youngness" has raised questions about the relationship to the age of the child and kindergarten retention (Lincove & Painter, 2006). Analysis of this variable will provide information on the predictive relationship of kindergarten entry age and multiple year experiences.

Experience in early childhood education programs has been identified as a possible intervention to prevent early school failure. In this sample, the average number

of hours children spent in out of home care prior to kindergarten was 26.01. This variable addressed the amount of out of home care but not the quality.

The ECLS-K statistics team developed the continuous SES variable by using a logarithm for values of occupation type and occupation prestige. The logarithm was developed to create a mean of 0. The mean for all children in the sample for the continuous SES measure was .04.

Table 3

Means and standard errors of means for continuous variables

Variable	Mean	SE
General knowledge assessment	50.46	.09
Mathematics assessment	51.05	.09
Reading assessment	50.38	.09
Social development assessment	3.36	.01
Self control assessment	2.82	.01
Height	44.72	.02
BMI	16.26	.02
Mother's age at first birth	23.51	.05
Student's age at K entry	65.63	.04
Hours spent in out of home care prior to	26.01	.20

Multiple year kindergarten experience

kindergarten		
SES	.04	.01

Because family income level has been an overall predictor of retention and school success, three different types of variables related to income level were examined. A categorical variable for poverty (y/n) was included. Two variables for SES were included. One SES was continuous and was derived from a logarithm of both parents' occupation and prestige scores. The categorical SES variable was derived by grouping the continuous variable into quintiles. The categorical poverty variable included 15.71% of who parents indicated they were below the poverty line. The categorical SES variable included 14.26 families in the first quintile. Each of these variables contributes a different aspect of the analysis of the relationship to income and kindergarten experience.

It is also important to distinguish between the 'If Enrollment Early or Delayed' categorical variable and the 'Age at Kindergarten Entry' continuous variable. The former provides information about children relative to the district policies regarding kindergarten entry. The latter provides information about the child's age which has been seen to be a predictor of readiness. Each provides important information to the analysis.

Univariate frequencies, row percents, odds ratios and significance levels

In order to understand the unique relationship of each variable to kindergarten experience, individual analyses were completed. Frequencies, row percents, odds ratios and significance levels were determined for each of the categorical subcategories relative to whether the child was entering kindergarten for the first time or not. Student and family categorical variables are reported in two separate tables.

Multiple year kindergarten experience

The odds ratio and the Wald Chi Square must be considered together to interpret the results of the analyses. The odds ratio represents the probability that an event will or will not occur to an individual in a given group compared to the chance that the event will occur to someone in the reference group. The odds ratio gives the size of the effect. The Wald test is used to test the significance of the specific contribution of each variable to kindergarten experience. While the odds ratio gives information about the size of the effect, the Wald test provides information about whether the effect is statistically significant. To be a statistically strong predictor, the odds ratio must be more or less than one and have a significant p value (.05 or less).

Table 4 reports frequencies, significance levels, odds ratios and row percents for each categorical student variable broken down by type of kindergarten experience. Significance based upon Wald Chi Square values and Odds Ratios are reported for each variable. The estimates test whether there is an increased likelihood of a child experiencing a multiple year kindergarten program for that individual variable. Significant relationships were found in subcategories for each of the student categorical variables analyzed.

The odds ratios and significance levels for Gender indicate that males are significantly more likely to experience multiple year kindergarten grades than females. The odds ratio (OR) for males over females is 1.80 signifying that males are 1.8 times more likely to experience more than one year in kindergarten ($p = <.0001$). Significant relationships were identified for Race. African American students were determined to be 1.37 times more likely to experience multiple year grades as compared to White, Non Hispanic students. Non-significant differences were found for all other categories. It is

Multiple year kindergarten experience

important to note that while not meeting the standards for significance set for this study, significance levels for Hispanic children were near the .05 standard ($p=.06$.)

A strong relationship between Disability/Yes and multiple year experiences as compared to Disability/No. The odds ratio (OR) for students identified as having a disability was 2.5 indicating that they were 2.5 times more likely to experience multiple years in a kindergarten grade as compared to children identified with no disabilities. This finding is significant at the $<.0001$ level.

Whether a child was found to be part of a multiple birth was not found to be a significant predictor of kindergarten experience. Previous research has indicated that being one of a multiple birth predicts later health and academic difficulties. This research did not support those findings.

Strong significant predictive relationships were found for two subcategories of When Enrolled. As compared to When Old Enough, Waited and Entered Early were found significantly related to multiple years in kindergarten. Children who waited past the typical district enrollment date were found to be 2.36 times more likely to experience more than one kindergarten grade than those “When Old Enough”. Those children who entered early were 3.46 times more likely to experience more than one year of kindergarten. than those “When Old Enough.”

Table 4

Univariate frequencies, row percents, odds ratios and significance levels for student variables by kindergarten experience

	First-	Frequency	Row	OR	ChiSq
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Multiple year kindergarten experience

	Time K		Percent		<i>p.</i>
Gender					
Female	Yes	7356	96.89	--	--
	No	237	3.11		
Male vs. female	Yes	7369	94.58		
	No	434	5.42	1.80	<.0001
Race					
White, Non-Hispanic	Yes	9177	96.09	--	--
	No	382	3.91		
African American vs. White	Yes	2185	94.76		
	No	123	5.24	1.37	.006
Hispanic (Specified and Non-Specified vs. White	Yes	1905	95.15		
	No	104	4.85	1.26	.06
Asian vs. White	Yes	793	96.52		
	No	30	3.48	.92	.71
Other vs. White	Yes	665	94.92		
	No	32	5.08	1.27	.25
Disability					
No	Yes	12735	96.47	--	--
	No	478	3.53		
Yes vs. no	Yes	1990	91.30		

Multiple year kindergarten experience

disability	No	193	8.70	2.5	<.0001
Birth status					
Single birth	Yes	14362	95.75	--	--
	No	649	4.25		
Multiple birth vs. single birth	Yes	363	94.11		
	No	22	5.89	1.41	.17

Table 4 (continued)

Univariate frequencies, row percents, odds ratios and significance levels for student variables by kindergarten experience

	First- Time K	Frequency	Row Percent	OR	ChiSq <i>p.</i>
When enrolled					
When old enough	Yes	13408	96.20	--	--
	No	527	3.80		
Waited vs. when old enough	Yes	1032	91.45		
	No	105	8.55	2.36	<.0001
Entered early vs.	Yes	285	87.84		

Multiple year kindergarten experience

when old enough	No	39	12.16	3.46	<.0001
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Table 5 summarizes frequencies, significance levels (ChiSq., *p.*), odds ratios (OR) and row percents for each categorical family variable broken down by type of kindergarten experience. Significant predictive relationships were found for five of six variables. For some variables, more than one subcategory was significant.

A significant relationship was found for Number of Parents in the Home. The subcategory of Other had an odds ratio of 1.54 relative to two parents. Note that this category was dichotomous. Thus, it was 1.54 times more likely that any number of parents in the home other than two had a significant predictive relationship ($p = <.0001$).

The analysis yielded significant relationships for three subcategories of Mothers' Expectations for the Student. Since Bachelor degree contained the largest number of subjects, it was used as the referent. Students whose parents indicated the expectation of a Graduate degree were 1.31 times more likely to experience multiple year kindergarten grades than those whose mother's expected a Bachelor degree. Likewise, students whose parents expected Some College experienced multiple kindergarten grades 1.61 times more than for Bachelor degree. And, students whose parents expected a High School diploma or less were 2.90 times more likely than those who indicated Bachelor degree.

The Home Language of the Student was found not to be significantly related to a multiple year kindergarten experience. While slightly larger percentages of children living in families where the home language was not English experienced multiple year kindergarten grades, these differences were not determined to be significant.

Multiple year kindergarten experience

The categorical SES measure was a variation of the continuous measure. That is, the continuous measure was divided into quintiles. These quintiles make up the categorical data. The SES quintiles provide less a method of analyzing groups of data rather than discrete increments. Several subcategories of the SES variable were found to be significantly related to multiple kindergarten year experience.

The first, second, and third SES quintiles (lowest three) showed significant relationships as compared to the fifth (highest.) Students whose families were in the First quintile were 2.71 times more likely to experience multiple year kindergarten than those in the Fifth. Students whose families were in the Second quintile were 1.61 times more likely than the Fifth. And, students whose families were in the Third quintile were found to be 1.44 times more likely to be in the multiple year group than students with families in the Fifth quintile.

Two subcategories of Mothers' Education were found to be significantly related to multiple year kindergarten experience. The largest proportion of mothers in the study indicated that they had a high school diploma or below. Students of these mothers were 2.07 times more likely to experience a multi year kindergarten grade than those with a BS. Students whose mothers indicated Some College were 1.47 times more likely than those with a BS. While students whose mothers indicated they had a Graduate degree experienced multiple kindergarten years in slightly higher proportions than those with a Bachelor degree, these differences were not significant.

The dichotomous Poverty variable was found to be significant. Students whose parents indicated they were at or below the poverty line were 1.82 times more likely than

those who indicated they were above the poverty line to experience a multiple year kindergarten grade.

Table 5

Univariate frequencies, row percents, odds ratios and significance levels for categorical family variables by kindergarten experience

	First-Time K	Frequency	Row Percent	OR	ChiSq <i>p.</i>
Number of Parents in the Home					
Two parents	Yes	11434	96.16	--	--
	No	469	3.84		

Multiple year kindergarten experience

Other vs. two parents	Yes	3291	94.25	1.54	<.0001
	No	202	5.75		
Mothers' Expectations for Child					
Bachelor degree	Yes	7320	96.77	--	--
	No	253	3.23		
Graduate degree and above vs. Bachelor degree	Yes	4023	95.85	1.31	.01
	No	187	4.15		
Some college vs. Bachelor degree	Yes	2115	94.92	1.61	.0001
	No	111	5.08		
High school or less vs. Bachelor degree	Yes	1267	91.31	2.90	<.0001
	No	120	8.69		

Table 5 (continued)

Univariate frequencies, row percents, odds ratios and significance levels for categorical family variables by kindergarten experience

	First-Time K	Frequency	Row Percent	OR	ChiSq p.
Home Language of Student					
English	Yes	13692	95.78	--	--

Multiple year kindergarten experience

	No	609	4.22		
Non-English vs. English	Yes	1033	94.64	1.28	.10
	No	62	5.36		
SES-categorical					
Fifth quintile	Yes	3539	97.06	--	--
	No	121	2.94		
Fourth quintile vs. fifth quintile	Yes	3304	96.89	1.05	.73
	No	112	3.11		
Third quintile vs. fifth quintile	Yes	3083	95.82	1.44	.0085
	No	138	4.18		
Second quintile vs. fifth quintile	Yes	2766	95.35	1.61	.0007
	No	138	4.65		
First quintile vs. fifth quintile	Yes	2033	92.49	2.71	<.0001
	No	162	7.51		

Table 5 (continued)

Univariate frequencies, row percents, odds ratios and significance levels for categorical family variables by kindergarten experience

	First- Time K	Frequency	Row Percent	OR	ChiSq <i>p.</i>
Mothers' Education					

Multiple year kindergarten experience

Bachelor degree	Yes	2527	97.33	--	--
	No	79	2.67		
High school diploma or below vs. Bachelor	Yes	5916	94.66	2.07	<.0001
	No	333	5.38		
Some college vs. Bachelor	Yes	5002	96.12	1.47	.01
	No	212	3.88		
Graduate degree vs. Bachelor	Yes	1280	96.63	1.27	.25
	No	47	3.37		
Poverty					
Above poverty	Yes	12470	96.16	--	--
	No	163	3.81		
At or below poverty	Yes	2255	93.34	1.82	<.0001
	No	163	6.66		

Table 6 reports the means (M), standard errors (SE) and the significance levels (*p.*) for continuous variables in this research. Analyses were conducted on eleven variables to determine the significance of their individual ability to predict which type of kindergarten grade students will experience. Of the eleven individual variables considered, seven were found to be significantly related to whether children experience a multiple year kindergarten grade.

Students' scores on the General Knowledge assessment were not found to be significant predictors of type of kindergarten experience. Children who experienced

multiple years in kindergarten had mean scores slightly higher than those entering kindergarten for the first time. However, these differences were not significant.

Students' who experienced multiple years in kindergarten had mean scores on the Mathematics assessment greater than those children entering kindergarten for the first time. As with the General Knowledge assessment, these differences in mean scores were not significant.

Students' who experienced multiple years in kindergarten had mean scores on the Reading assessment had mean scores greater than those entering kindergarten for the first time. Mean score differences for the Reading assessment were determined to be significant at the $<.0001$ level. Taken another way, students entering kindergarten for the first time had scores on the Reading assessment that were significantly lower than for those experience multiple years

Students who experienced multiple years in kindergarten had mean scores on the Social rating scale significantly lower than scores for those entering kindergarten for the first time. On the five point scale, students experiencing multiple years received a mean score of 3.26 from their parents while first time kindergarten children received mean scores of 3.36 ($p=<.0001$).

Students who experienced multiple years in kindergarten had mean scores on the Self Control rating scale significantly lower than scores for those entering kindergarten for the first time. The average rating for students in a multiple year progression was 2.74. The average rating for first time kindergarten students was 2.83. This difference was significant at the .0003 level.

Multiple year kindergarten experience

Height significantly predicted the type of kindergarten grade children would experience. Students experiencing multiple years were taller on average with a mean height of 45.72 inches. First time kindergarten students had a mean height of 44.67 inches. Note that age in grade was not controlled in this analysis. This significant difference could be a result in difference in ages and hence growth of children in the two groups ($p < .0001$).

BMI did not significantly predict type of kindergarten experience. BMI was almost exactly the same for students experiencing multiple years and first time kindergarten.

The Mother's Age at First Birth significantly predicted kindergarten experience. Students who experienced a multiple year kindergarten grade had mothers with a mean age of 22.0 years of age at the time of their first birth. First time kindergarten students had mothers with a mean age of 23.58 years at the time of their first birth. These differences are significant at the $< .0001$ level.

Students' age at kindergarten entry was found to be significantly related to type of kindergarten experience. Students experiencing multiple years in kindergarten had a mean age at first entry of 60.87 months. Students who were entering kindergarten for the first time had a mean entry age of 65.84 months. District policies for kindergarten eligibility were not considered in this variable.

The average weekly number of hours children spend in out of home care prior to kindergarten was not found to be a significant predictor of multiple year kindergarten experience. The average weekly hours for students experiencing multiple years was 25.22. The average for first time kindergarten students was 26.04.

Multiple year kindergarten experience

The continuous SES variable was found to be significantly related to multiple year experience. As stated in Table 3, the average overall SES level was .04. The average for students experiencing multiple years was -.19. The average for first time kindergarten students was .05. These differences were significant at the <.0001 level.

Table 6

Continuous variables by first time kindergarten experience

	First- Time K	Mean	Standard Error	<i>p.</i>
General knowledge assessment	Yes	50.44	.09	.40
	No	50.80	.42	

Multiple year kindergarten experience

Mathematics assessment	Yes	51.03	.09	.29
	No	51.48	.43	
Reading assessment	Yes	50.32	.09	<.0001
	No	51.72	.42	
Social development rating	Yes	3.36	.01	<.0001
	No	3.26	.03	
Self control rating	Yes	2.83	.01	.0003
	No	2.74	.02	

Table 6 (continued)

Continuous variables by first time kindergarten experience

	First-Time K	Mean	Standard Error	<i>p.</i>
Height	Yes	44.67	.02	<.0001
	No	45.72	.09	

Multiple year kindergarten experience

BMI	Yes	16.25	.02	.91
	No	16.27	.10	
Mother's age at first birth	Yes	23.58	.05	<.0001
	No	22.00	.22	
Student's age at K entry	Yes	65.84	.04	<.0001
	No	60.87	.19	
Weekly hours spent in out of home care prior to kindergarten	Yes	26.04	.20	.42
	No	25.22	.98	
SES	Yes	.05	.01	<.0001
	No	-.19	.03	

Multiple Logistic regression

The criterion variable for this research study is dichotomous (first time kindergarten or not.) Because of this, a multiple logistic regression was used to examine model predictors for who will receive one of the two types of kindergarten experience. All variables in Tables 3,4, and 5 were considered for inclusion in the final model. Results of the backwards logistic regression are summarized in Table 7. Through a series of iterative steps, non-significant variables were removed until only significant variables remained. The predictor variables in the final model are SES, Gender, Disability Status, Parents in the Home, When Entered, Home Language, Mothers' Expectations for children, Mothers' Age at First Birth, Reading Assessment scores, and Social Skills ratings.

As with the univariate analyses (see Table 5), the first, second, and third SES quintiles (lowest three) showed significant relationships as compared to the fifth (highest.) Students whose families were in the First quintile were 2.22 times more likely to experience multiple year kindergarten than those in the Fifth ($p<.0001$). Students whose families were in the Second quintile were 1.49 times more likely than the Fifth ($p=.01$). And, students whose families were in the Third quintile were found to be 1.48 times more likely to be in the multiple year group than students with families in the Fifth quintile ($p=.01$).

Gender remained a significant predictor of multiple year kindergarten experience (see Table 4). The odds ratios and significance levels for Gender indicate that males are significantly more likely to experience multiple year kindergarten grades than females. The odds ratio (OR) for males over females is 1.71 signifying that males are 1.71 times more likely to experience more than one year in kindergarten ($p<.0001$).

A strong relationship between Disability/Yes and multiple year experiences as compared to Disability/No. The odds ratio (OR) for students identified as having a disability was 2.45 indicating that they were 2.45 times more likely to experience multiple years in a kindergarten grade as compared to children identified with no disabilities. This finding is significant at the $<.0001$ level.

A significant relationship was found for Number of Parents in the Home. The subcategory of Other had an odds ratio of 1.24 relative to two parents. Individually this variable showed that students in Other category were 1.44 times more likely to experience multiple years. This likelihood was modified slightly when considered in the full model. It was significant at the .03 level.

Multiple year kindergarten experience

When entered continues to be a significant predictor of multiple year experience. Students entering early are 3.60 times more likely to experience multiple years when compared to students who enter on time. Students waiting to enter are 2.18 times more likely to experience multiple year programs. Both are significant at the $<.0001$ level.

Language Spoken in the Home was found to be a significant predictor of multiple year experience in the logistic model. It was not, however, significant in the univariate analyses. Odds ratios indicate that it is 1.49 times more likely that children in Non-English speaking homes will experience multiple year programs than English speaking homes. It is significant at the .02 level.

Mothers' Expectations for the Student continued to be a significant predictor of kindergarten experience. Odds ratios indicated that students whose parents indicated the expectation of a Graduate degree were 1.27 times more likely to experience multiple year kindergarten grades than those whose mother's expected a Bachelor degree ($p=.03$). Likewise, students whose parents expected Some College experienced multiple kindergarten grades 1.46 times more than for Bachelor degree ($p=.0004$). And, students whose parents expected a High School diploma or less were 2.20 times more likely than those who indicated Bachelor degree ($p=<.0001$).

The Reading assessment score variable appeared as a significant predictor in the logistic model. The odds ratio indicated that children with higher scores were 1.05 times more likely to be included in the multiple year group. This means that for each unit increase in the assessment score, students were more at risk for being assigned to a multiple year kindergarten ($p=<.0001$).

Mothers' Age at First Birth significantly predicted kindergarten experience.

Because it is less than one, the odds ratio of .95 indicates that for each decrease in one unit of age (continuous variable) there is an increase risk in the likelihood of the student experiencing a multiple year kindergarten ($p < .0001$).

The Social Rating Scale score was found to be a significant predictor of kindergarten experience in the final logistic regression model. Similar to the Mother's Age at First Birth variable, the odds ratio for the Social Rating Scale score was less than 1 at .79. This indicates that for each decrease in one rating unit (five point scale) there is a risk for the increase in the likelihood of the student experiencing a multiple year kindergarten grade ($p = .0004$).

Table 7

Final model with sub-categories

Variable	Chi-Square	OR	p.
SES-categorical (df=4)	24.60		
Fourth quintile vs. fifth quintile	.58	1.12	.43
Third quintile vs. fifth quintile	6.79	1.48	.01
Second quintile vs. fifth quintile	6.26	1.49	.01
First quintile vs. fifth quintile	20.88	2.22	<.0001

Table 7 (continued)

Final model with sub-categories

	Chi-Square	OR	p.

Multiple year kindergarten experience

Gender (df=1)	33.17		
Male vs. female	33.15	1.71	<.0001
Disability status (df=1)	77.56		
Disability vs. no disability	77.56	2.45	<.0001
Parents in home (df=1)	4.48		
Other vs. two parents	4.48	1.24	.03
When entered (df=2)	68.95		
Early vs. on time	39.59	3.60	<.0001
Waited vs. on time	35.21	2.18	<.0001
Language spoken at home (df=1)	5.79		
Non-English vs. English	5.79	1.49	.02
Mothers' expectation for child's education (df=3)	32.03		
Graduate degree vs. Bachelor degree	4.47	1.27	.03
High school	31.32	2.20	<.0001
Some College	8.13	1.46	.0004
Reading assessment score (df=1)	108.88	1.05	<.0001
Mothers' age at first birth (df=1)	22.03	.95	<.0001
Social rating scale score (df=1)	8.01	.79	.0004

CHAPTER 5

DISCUSSION

Introduction

Using ECLS-K study data, this research explored the predictors for children's assignments to one of two types of kindergarten experiences. This study contributes to existing literature on early grade retention. It also adds to research on the relationship of child and family variables and single versus multiple year kindergarten experience.

This chapter will discuss the results found in the previous chapter. It will contain three sections. The first section will present the implications based on the literature review. The second section will present information about the limitations of the study. The final section will discuss the need for future research.

Implications

School readiness is a construct that is often used to depict a child's likelihood for success in kindergarten. Popular understandings of school readiness include expectations for levels of physical, mental and emotional development as related to social and academic experiences in the kindergarten grade (Graue, Kroeger, & Brown, 2002). Each year, children deemed to be 'not ready' are assigned to multiple year kindergarten grades even though researchers have questioned their efficacy and cost (Butaine, 1997). Because of the large numbers of children experiencing a variety of multiple year grades, it is important to study the predictors and the consequences of kindergarten retention.

As suggested by Jimerson, (2001), much previous research has been conducted on grade retention based on whether children are too old for their grades. However, using a child's age in kindergarten as a proxy for kindergarten retention is problematic. The kindergarten year in particular can hold a wide range of ages due to the different start dates of districts across the country and the practice of enrolling children before or after they are eligible.

The ECLS-K data provide a clearer understanding of predictors of multiple year kindergarten programs because they are based upon actual kindergarten experience. Interpretations of predictors can be made more directly. Because of this, results from this study contribute to existing evidence by demonstrating that child and family variables significantly predict who will be assigned to attend kindergarten for more than one year.

SES. Previous studies have linked SES with grade retention and academic success (Hair et al., 2006; Klebenov, Brook-Gunn, McCarton, & McCormick, 1998; Maggi & Hertzman, 2004; Nobel, Norman, & Farah, 2005). This study contributes to that literature by demonstrating that SES is a significant predictor for length of kindergarten experience. The SES variable in this study was derived by combining parent or guardian occupation, education and income. The SES level was then divided into quintiles. Living with a family in the first (lowest), second and third quintiles for SES was a significant predictor (as compared to the fifth) that a child would experience a multiple year kindergarten grade. The fourth quintile was not a significant predictor.

Typically, retention has been linked to children in families below poverty (Moore et al., 2009). This study suggests that even children who live in families at the middle quintile are at a higher risk for a multiple year experience. This finding has policy implications for means based academic supports. Eligibility for many public academic prevention and intervention programs are directed toward those at the lower end of the poverty scale. This study suggests that children in moderate SES categories may be at risk for extended kindergarten experiences.

Gender. Gender has previously been found to be a predictor of retention and academic failure (Jimerson et al., 1997; Malone, West, Denton, & Park, 2006). This

study confirms previous findings. Males were found to be at higher risk for multiple year kindergarten grades as compared to females. Previous studies have suggested that teacher perceptions of gender differences (Pigott & Cowen, 2000; Piotrkowski et al., 2001) as well as gender specific peer and teacher relationships (Pianta, Steinberg, & Rollins, 1995a; Underwood, 2007) contribute to children's differential vulnerabilities at the beginning of school. Because of the pervasive nature of the findings for males across time, it is important to examine alternatives to curriculum and reward structures in schools (Reichert & Kuriloff, 2004).

Disability Status. Children with disabilities were found in this study to have a strong predictive risk for multiple year kindergarten experiences. Transition to school places additional demands on children with disabilities (Horowitz, Kaloi, & Petroff, 2007). Children with disabilities have been found to have less positive early school experiences (McIntyre, Blancher, & Baker, 2006).

Social demands are increased because children are expected to interact with larger and more diverse groups children. Academic demands are increased due to the large amount of time and focus on curriculum related products (Ladd et al., 2006; Rimm-Kaufman, Pianta, & Cox, 2001; Stipek, 2005). This finding has implications for early intervention and kindergarten transition. It is likely that without increased levels of support, successful completion of kindergarten is more difficult (*Fuchs, Mock, Morgan, & Young, 2003*).

Number of Parents in Home. The number of parents in the home significantly predicted kindergarten experience. The variable Number of Parents in Home was dichotomous. The subcategory Two Parents was compared to Other. The Other

subcategory was made up of a variety of family types. Single parents, foster placements, other relatives were all possible within the Other subcategory.

In this study, children living with two parent families were significantly more likely to be entering kindergarten for the first time. Previous research on the relationship of family structure and early grade success has provided mixed findings (Pati et al., 2009). Generalizations about the findings in this study should be made cautiously due to the wide variety of family structure types within the Other category.

When Enrolled. A strong predictive relationship was found in the timing of kindergarten entry and the type of kindergarten grade. Previous Research has found that parents' beliefs about school readiness are a critical component in the timing of enrollment. Children believed to be ready for school but young by district standards are enrolled early. Children believed to be 'not-ready' are held back an extra year (Piotrkowski et al., 2001). Both actions are typically taken to give children opportunities to succeed.

This research suggests that enrolling children early or waiting an extra year to enroll is associated with increased risk for multiple year kindergarten grades. In this study, 8% of the children waited to enter kindergarten. This is consistent with previous research which shows delayed entry between 5% and 16 % (Graue & DiPerna, 2000; Stipek, 2002). An additional 2% entered early. Since research does not provide evidence of positive effects for this practice, more study is needed on the reasons for differential enrollment and practices that support success.

Language Spoken in the Home. Previous research has identified English language learners as being at a higher risk for academic and social failure (Halle et al., 2009;

Manis, Lindsey, & Bailey, 2004; Willson & Hughes, 2006). In this current study, children whose home language was something other than English were found to be at a significantly higher risk for multiple year kindergarten grades. For example, Hispanic children, whose first language is not English are twice as likely as non-Hispanic White to read below average for their grade. (Stormont et al., 2003). Many academic content areas require language and literacy skills. Language is also a critical element of successful social interaction. This study contributes to the existing literature in that English Language Learners are at high risk for being challenged in the early grades.

Mother's Academic Expectations. This study extends the research on the links between adult expectations and academic success of children. Lower adult expectations for success have been linked to poor school attendance, low academic performance and disruptive behavior (Auwarter & Aruguete, 2008; Benner & Mistry, 2007; Taylor & Lopez, 2005). Parental estimates of school social adjustment predicted kindergarten retention of Head Start children (Mantzicopoulos, 2003b). Research has linked family income and resources to academic expectations and outcomes (Davis-Kean, 2005; De Civita, Pagani, Vitaro, & Tremblay, 2004; Zhan & Sherraden, 2003). In the current study, mothers' expectations for academic achievement predicted the type of kindergarten grade children experienced.

Reading Assessment. In the current study, reading assessments were administered to children at the beginning of kindergarten. Children entering kindergarten for the second time had by definition experienced a year of kindergarten instruction. Higher Reading Assessment scores were found to be a significant predictor of multiple kindergarten experience. That means that children who had already experienced a year of

kindergarten instruction scored significantly higher than those who had no kindergarten experience. One explanation is that instructional benefits in reading were seen for kindergarten children who were retained. No comparison assessments for retained children in their first year were available so it is unknown whether these children entered the first year with a higher reading level than the first year students in the study.

Age of Mother at First Birth. This study supports previous research in which maternal age was found to predict, albeit weakly, poor outcomes (Pati et al., 2009). In this study, the child's mother's age at the time of her first birth was found to be a significant predictor of multiple year kindergarten grades. No attempt was made to determine if the focus child was the mother's first child. That is, in this study, no analysis was made to link the mother's current age with the child's kindergarten grade status. Simply having a child at a younger age predicted the focus child's years in kindergarten.

Social Skills Rating. Increased levels and types of social interaction are expected for kindergarten. Social skills are necessary for developing relationships with teachers and peers (Ladd et al., 2006). In addition, social skills contribute to a child's ability to access academic content (Ladd et al., 1999; McClelland, Morrison, & Holmes, 2000).

In the present study, children whose mothers rated them lower on a social rating scale were found to be more likely to experience multiple year kindergarten grades. Along with their children, these parents had experienced at least one year of kindergarten prior to completing the rating scale. The rating scale consisted of five questions related to the child's competence in building relationships with children and adults. Since no such

rating scale results are available from the child's first year of entry to kindergarten, it is not known whether social skills increased in the previous year. The degree to which parents' ratings were influenced by the previous year is also not known.

It is interesting to note that the parent ratings for Self Control were not found to be significant predictors for multiple year programs. The Self Control rating scale was based upon elements of self regulation. Self regulation has been found in past research to predict academic and social outcomes. The fact that Self Control was not found in this study significantly predict further highlights the importance of children's opportunities to develop competencies in relationship building.

In all, the results of this study indicate that factors presenting substantial risks for multiple year kindergarten grades exist outside of the classroom. With the exception of the assessment scores for second year kindergarteners, all of the variables were obtained prior to kindergarten experience. Significant predictors of assignment to multiple year kindergarten grades were independent of classroom effects. This corresponds to other research showing that a child's skills and abilities account for less than 25% of variance in kindergarten outcomes (LaParo & Pianta, 2000). In addition, classroom factors related to school success such as absenteeism and student mobility may well be linked to out of classroom factors (Hickman, Bartholomew, Mathwig, & Heinrich, 2008; Lehr, Sinclair, & Christenson, 2004; Rumberger, 2004). To high degrees, out of classroom variables predicted the course of the child's kindergarten experience.

Limitations

The analysis of these data provided significant findings. However, generalization of findings is hampered by several limitations. First, the comparison groups for the

study were based upon differing time frames and must be evaluated. Second, much of the data was obtained through self report and can be inaccurate. Finally, the age of the data used in the study raises questions regarding generalization to current school contexts. Each limitation is discussed below.

Comparison groups. The comparison groups in the ECLS-K data were developed based upon whether children were entering kindergarten for the first time or not. It is highly likely that some of the children in the first year kindergarten group would have repeated kindergarten in some fashion. Because of this, predictors for first time kindergarteners contained information about children who would likely repeat kindergarten. It is estimated that 5 – 10% of children will be retained each year (Silberglit et al., 2006). The study attempted to predict multiple year experiences. However, specific predictors for this group of children were not isolated and analyzed.

In the analytic sample, 4.36% of the sample entered kindergarten for the second time. This is low compared to previous research (Hong & Raudenbush, 2005; Jimerson, 2001; Jimerson & Ferguson, 2007; Silberglit et al., 2006). It is possible that a lack of information or a social bias provided a low response to the question.

Self report. Another limitation to the findings is that most of the information was gathered through self report. Information about the child's kindergarten experience was provided by a family member during a telephone survey. This information was not confirmed through other data sources. Due to the variety of names for varying experiences in kindergarten, parents may have not known whether it was the child's first year in kindergarten. It may also be the case that parents are reluctant to report a multiple year experience. It is therefore possible that error was introduced.

Age of data. A third major caution in generalizing these study results relates to the age of the data. Data in this study were gathered in 1998. Since then, major education reforms have been implemented nation wide. State funded preschool education has increased significantly (Pre K Now, 2008). Early education programs have become more standards based (Bodrova & Leong, 2005; Scott-Little et al., 2006). And, the No Child Left Behind legislation has placed more emphasis on results of achievement tests that have been disaggregated by race and disability categories (PL107-110; 2002). It is unknown how these trends have changes decisions regarding multiple year programming.

Conclusion and Future Research

Many are calling for a focus on evidence based decision making in education (Rouse & Fantuzzo, 2007). Yet, each year children are assigned to developmental, transitional or repeated kindergarten grades with little information about the differences in curriculum and teaching practices or outcomes. Further research is needed to differentiate the characteristics, costs and consequences of each of these types of experiences.

In addition to researching the characteristics and consequences of types of kindergarten experience, investigation is needed to provide information regarding the context and specific reasons parents and district personnel give for assigning children to types of kindergarten grade. Overall parents, teachers and principals report extending kindergarten as a means to prevent failure. But, little research looks at the reasons why concerns for the child's success exist. Research on the specifics of the mismatch between expectations and the child's skills and behaviors is needed to guide early intervention.

Research is also needed to understand the trends and consequences of early and late kindergarten entry. Past research has shown that mothers tend to delay kindergarten entry for two primary reasons. They either delay because of concerns about troubling behavior or development of their children or because of their own beliefs about development and schooling (Frey, 2005; Noel & Newman, 2008).

The date that children are eligible for kindergarten varies across the country. The process for admitting children early varies equally. However, very little research on the outcomes on early kindergarten entry exists. More research is needed to understand the conditions upon which early entry provides benefits to children. It is equally important to understand negative impacts of early entry.

Expectations for performance in kindergarten vary from district to district. Opportunities for students to prepare to meet those expectations prior to kindergarten also vary. This study revealed that variables proximal to the child strongly predict the type of kindergarten experiences children will receive. Adequate family resources and experience with positive relationships are essential to a student's preparation for successful kindergarten experiences.

In order for children to move through kindergarten successfully, interventions must be provided that are directed toward the mismatch between adult expectations and the student's opportunities to develop social and academic skills. Interventions are particularly important for students learning English and students with disabilities. Whether prior to kindergarten entry or during the kindergarten year, interventions geared closely to the child's risks should be in place. Extra effort is needed to close the gap between skills and expectations.

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