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Impact of Preschool Education on Reading Achievement of Kindergarten Through Fifth Grade Students

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The University of Southern Mississippi

IMPACT OF PRESCHOOL EDUCATION ON READING ACHIEVEMENT OF KINDERGARTEN THROUGH FIFTH GRADE STUDENTS

by

Melissa Harvey Clark

A Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

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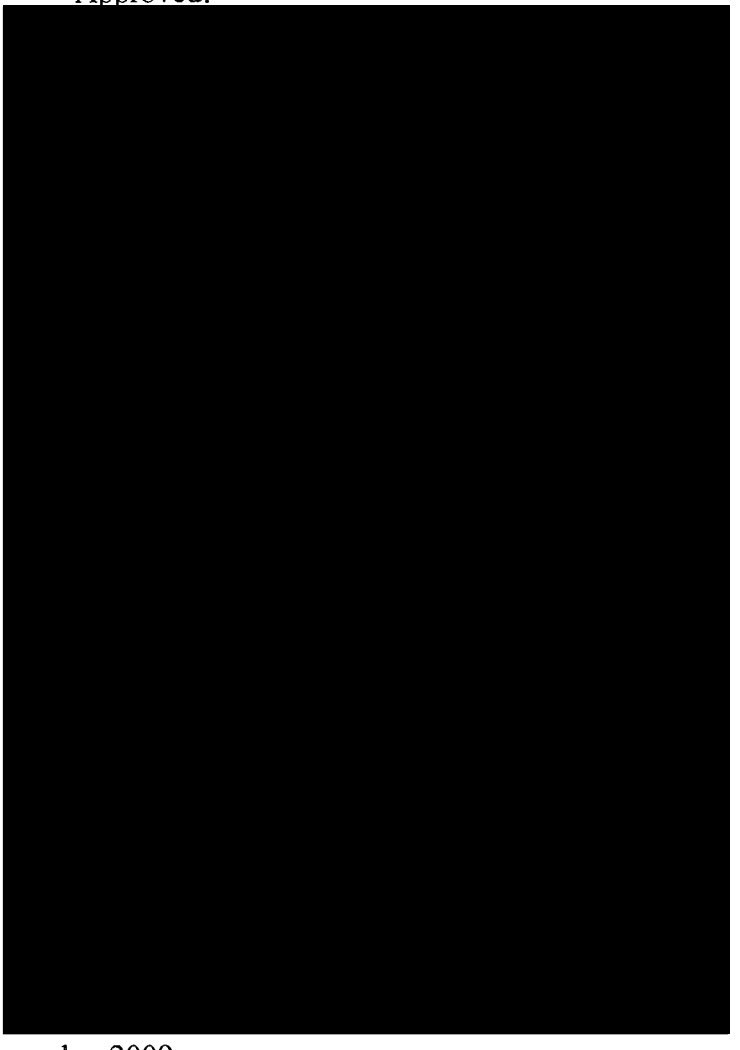

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ABSTRACT

IMPACT OF PRESCHOOL EDUCATION ON READING ACHIEVEMENT OF KINDERGARTEN THROUGH FIFTH GRADE STUDENTS

by Melissa Harvey Clark

December 2009

This study examines the impact of various types of preschool care and education on the reading achievement of children, kindergarten through fifth grade, who participated in the Early Childhood Longitudinal Study-Kindergarten Class of 1998-99 (ECLS-K). The participants in this study are located throughout the United States of America. These students attend public and private schools.

The data for this study were provided by the National Center of Education Statistics (NCES), a division of the U.S. Department of Education. The researcher utilized ECLS-K's Public Use Data File and Electronic Codebook to create an SPSS syntax file in order to determine if there is a difference in the longitudinal reading achievement of students from Kindergarten through the Fifth Grade and the cohort reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on their preschool educational experience. Recommendations are provided for policymakers, teacher education programs, early childhood professionals, administrators, and K-12 public school teachers. A one way analysis of variance was conducted and indicated that the effect of preschool experience on the longitudinal reading achievement of students Kindergarten through the Fifth Grade was significant, $F(4, 2528) = 46.42$, $p<.001$. A one way analysis of variance was also conducted to test hypothesis 2 and indicated that the effect of preschool experience on the cohort reading

achievement of students in Kindergarten, $F(4, 14291) = 90.6$, First Grade, $F(4, 13919) = 51.72$, Third Grade, $F(4, 11772) = 6.35$, and Fifth Grade, $F(4, 9367) = .89$ was significant. Suggestions for future studies are presented as well.

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CHAPTER I

INTRODUCTION

The proposed study examines the impact of various types of preschool care and education on the reading achievement of children, kindergarten through fifth grade, who participated in the Early Childhood Longitudinal Study-Kindergarten Class of 1998-99 (ECLS-K). The current study examines the various types of pre-school education, the research related to each and the reading achievement of preschool children in various childcare settings in order to determine which programs or early education environments serve children best in preparing them to enter the K-12 school setting.

In today's fast paced and demanding society, more and more parents are entering the workforce. With more parents working, children are entering the out-of-home educational setting earlier. Due to more parents working, the new welfare policy work requirements, the increasing roles of federal and state governments in supporting child care services for families of low-income, and the concern for school-readiness, child care has become a significant element of social policy (Urban Institute, 2000). The Children's Defense Fund (2004), reported that 64% of mothers with children under age six work outside the home, with 61% of children ages birth to six being cared for by someone other than their parents. In many of these cases, parents depend on before or after school programs, daycares, preschool programs, or a relative or non-relative caregiver in the home to provide for their children's early education.

The Children's Defense Fund (2004) reported that one in six or 12.1 million American children lived in families whose annual income was below the government poverty level in 2002. Therefore, the cost of child care becomes relevant and an

important topic. They also reported that the cost of one year of child care ($4,000 to $10,000) for a four-year-old reportedly exceeds the cost of one year of tuition at a four year public university in 48 states of the country. The growing number of children and families living in poverty may explain why the number of children attending Head Start, a federally funded preschool program for children of poverty, has more than doubled in the past thirty years (Children's Defense Fund, 2004).

The nation has also been alarmed concerning the declining academic achievement of its students, which has focused national attention on the preparation for school many American children experience (Committee for Economic Development, 1993). These issues present a convincing case for the importance of and need to provide preschool environments that adequately educate our nation's children. This challenge is only magnified when one considers that seven out of ten fourth graders in the United States cannot complete mathematics or read on grade level (Children's Defense Fund, 2004). Therefore, it is more critical today than ever to evaluate and examine the preschool care and education being offered to young children and their families in the United States.

Over the years, early childhood has been continuously viewed as a critical period in a child's development of cognitive, language, and literacy skills. It has also been noted that these skills appear to be influenced and shaped by the child, their family characteristics, child care, and beginning classroom experiences (Morrison & Cooney, 2002; National Institute of Child Health and Human Development [NICHD] Early child Care Research Network [ECCRN], 2002). In order to assure equity, aid in the adjustment to formal schooling, and improve development and education for all children, it is important to examine the achievement of preschool children in various child care settings

and determine which programs or early education environments serve our children best in preparing them to enter the K-12 school setting in the United States. A 1996 national survey by the National Center for Early Development and Learning (NCEDL) concerning the transition practices of entering kindergarten reported that 48% of children experience moderate to serious problems in transitioning to kindergarten, with the teachers of urban, high minority, and high poverty areas reporting the most challenges (Pianta, 1999). In 2000, a national sample of kindergarten teachers reported that, in their opinion, 30% of their present class or classes displayed moderate difficulty in adjusting to school and 16% of the students had even more serious problems (Rimm-Kaufman, Pianta, & Cox, 2000).

Since reading is a skill which impacts all other subject areas, it becomes a good measurement of academic success (U.S. Department of Education). Research indicates that children who read well in the early grades are by far more successful in later years; and those who fall behind in the early years often stay behind in their academic achievement (Snow, Burns, & Griffin, 1998). Therefore, it is important to examine the reading achievement of all children as they enter kindergarten and progress through the early grades in order to determine which preschool education background contributes most to educational success. Reading opens the door to learning mathematics, history, science, literature, geography and much more. Thus, young, capable readers can succeed in these subjects, take advantage of other opportunities (such as reading for pleasure) and develop confidence in their own abilities. On the other hand, those students who cannot read well are much more likely to drop out of school and be limited to low-paying jobs throughout their lives. According to the Wrightslaw website

(http://wrightslaw.com/nclb/faqs/reading.htm#24), reading is undeniably critical to success in today's society.

The purpose of this study was to determine whether there is a statistically significant difference in the longitudinal reading achievement of students from Kindergarten through the Fifth Grade and the cohort reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on pre-school education by : 1) attendance at a Head Start Program, 2) care provided by a relative at home, 3) care provided by a non-relative at home, 4) care provided by a center-based program, or 5) care provided by two or more different programs.

According to McCormick and Mason (1986), the preschool years are a time when the environment in which a child develops can contribute to great differences in language and literacy skills. Most often, before children can read in the literal sense, they must acquire some understanding of the purposes and mechanics of reading. However, the opportunities in which children have to learn vary greatly with some children having many opportunities to learn about reading, while others have very few opportunities (McCormick & Mason, 1986). According to the National Research Council (1998), the preschool children who are familiar with the purpose and concept of print are considered reading ready. Being reading ready at school entry has been found to be highly correlated with reading ability in the primary grades (Hammill & McNutt, 1980; Scarborough, 1998).

In 2000, the National Center for Educational Statistics (NCES) published the survey results of America's kindergarten class of 1998-99 (National Center for Education Statistics, 2000). The survey examined the number of "first-time-to-kindergarten"

children who had literacy skills which are prerequisites to learning to read (National Research Council, 2001, p. 65). These prerequisite skills included understanding that print reads left to right, understanding where to go when a line of print ends, and understanding where the story ends. The results indicated that 37% of children that entered kindergarten for the first time could perform all three of the skills, but 18% could not perform any of the three skills. As the children entered kindergarten, 66% recognized their letters, 29% recognized beginning sounds in words, and 17% recognized ending sounds (National Center for Education Statistics, 2000). Many factors can influence the test results, for the purposes of this study, the early childhood learning environment will be the primary focus.

Statement of the Problem

The early school experiences of children have become a national concern since evidence has consistently been directed toward the significance of early achievement in the prediction of educational accomplishments of children in the future (Chen, Lee, & Stevenson, 1996). With kindergarten teachers reporting that 30% of their class experienced moderate difficulties in adjusting, and 16% had even more serious problems (Rimm-Kaufman, Pianta, & Cox, 2000), the area with the greatest influence and concern points to the early educational experiences of children (Burchinal et al., 2002; NICHD ECCRN, 2000).

Research Questions

1. Is there a statistically significant difference in the longitudinal reading achievement of students from Kindergarten through the Fifth Grade based on the type of preschool education they experienced?

2. Is there a statistically significant difference in the cohort reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on the type of preschool education they experienced?

Research Hypotheses

H_1 There is a statistically significant difference in the reading achievement of students from Kindergarten through the Fifth Grade based on the type of preschool education they experienced.

H_2 There are statistically significant differences in the reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on the type of preschool education they experienced.

Definition of Terms

1. *Center Based Program*: Care provided by a childcare center other than Head Start.
2. *Cohort Reading Achievement*: The reading achievement of a specific subpopulation, based on some specific characteristic (such as grade level), and is studied over time.
3. *Dunnett's C*: This test makes pairwise comparisons. It "compares the mean of a particular group in the study against each of the remaining group means" (Huck, 2008, p. 291).
4. *Formal School*: This term describes the kindergarten through grade twelve public or private school education.

5. *Head Start*: A national program sponsored by the United States Department of Health and Human Services which focuses its attention on serving children from low-income families (Kagan, 2002).
6. *Levene's Test for Equality*: An inferential statistic used to assess the equality of variance in different samples. Some common statistical procedures assume that variances of the populations from which different samples are drawn are equal. Levene's test assesses this assumption. It tests the null hypothesis that the population variances are equal.
7. *Non-relative Care at Home*: Care provided in the child's home by someone who is not a family member.
8. *Parent or Primary Caregiver*: "The adult in the child's life that is either the biological parent of the child, has gained guardianship of the child or provided the majority of the daily care for the child" (Albritton, 2003).
9. *Preschool Educational Experience*: The learning experiences that children ages birth to five have had prior to beginning K-12 schooling. An example would be a preschool program or teaching in the home by a relative or non-relative.
10. *Reading*: The act of viewing and recognizing printed or written symbols which serve as stimuli for the recall of meanings built up through past experience and serve to create understanding (Harris & Hodges, 1995).
11. *Reading Achievement*: The standardized T-score as reported by National Center for Educational Statistics (NCES) to measure reading achievement at which an individual student can be compared to his or her grade level and peers in the area of reading.

12. *Reading Ready*: The preschool children who are familiar with the purpose and concept of print (National Research Council, 1998).
13. *Relative Care at Home*: Care provided by a parent or other family member in the child's home.
14. *Sample Freshening*: Adding students to the grade sample who have not participated in the previous sample taken by the ECLS-K (Tourangeau et al., 2005).
15. *School Readiness*: Being prepared intellectually, maturationally, motivationally, and experientially to cope with the learning tasks and social environment of school.
16. *School Setting*: Any educational institution (public school, private school, home schooling) that is authorized by law to teach students.
17. *Socioeconomic Status*: A person's standing or position in a society because of such factors as level of education, income, social class, and type of job (Harris & Hodges, 1995).
18. *Stakeholders*: Groups or individuals who are legal advocates of students (guardians, parents, community members, educators, policymakers, and administrators).
19. *Tukey*: "A multiple comparison technique developed by J.W. Tukey for establishing whether the differences among various sample means are significant. The test is performed after the ANOVAwhen the F ratio is significant. It is thus a post-hoc test" (Sprinthall, 2000, p. 601).

20. *Two or More Different Programs*: Care provided for a child through more than one source. For example, one child may attend a center for part of the day and stays with a relative the second part of the day or the child may attend Head Start three days a week, but stays at home with a non-relative two days a week.

Limitations of the Study

In order for a child to qualify for this study, they must be in kindergarten through fifth grade and have participated in the ECLS-K. Usage of archival data limits the grades available for analysis in the study. Since data is only available for kindergarten, first, third, and fifth grades, these are the grades that were analyzed in the study. The usage of archival data also placed limits on the types of variables or preschool educational experiences available for analysis.

Delimitations of the Study

The researcher chose to use all the grades (kindergarten, first, third, and fifth) in which data had been collected by NCES rather than choosing to limit the study to a few grades, which acts as a delimitation. The researcher also decided to collapse some categories to make them more understandable. The variable, P1 Primary Type Non-parental Care Pre-K, created by NCES was recoded. In that variable, the -9 and -8 were recoded as system missing. Relative care at home was recoded as 2 while 3 and 4 were recoded as 3, non-relative care at home. The Head Start Program was recoded as 5 and center-based programs were recoded as 6. The two or more programs category was recoded as 7.

Justification

This research study examined a national sample of students while focusing on the common concern of reading achievement. With so much national emphasis (e.g., No Child Left Behind) on student achievement and success in America's schools and on providing early childhood experiences that produce more capable individuals, the national government and state policy makers have invested heavily in early childhood interventions and programs to give all children, but especially children of poverty, a better start. This nationwide emphasis and investment is a result of policy makers' efforts to increase school readiness upon entry and school success as a whole. Because the early years are viewed as a vital time in which interventions are likely to have long-term positive effects (Barnett, 1995; Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997; Ramey & Ramey, 1998), a study of experiences and care in the preschool years is a logical starting point to assess and determine which avenues of early education possibly contribute to student achievement.

As a large body of research on the positive impact of preschool education has been established in the past, it is commonly accepted that one of the key factors to student achievement is early intervention through high quality early childhood experiences ("Children Reap Significant Benefits," 2007). Erik Erikson, a renowned researcher who studied the stages and life span of humans, developed the view that in the earliest years, a person develops patterns that regulate or influence a person's actions and interactions for the rest of his or her life (Mooney, 2006). Since an increasing number of policy makers have been taking notice of this empirical evidence, forty states and the District of Columbia have implemented or are creating state-funded pre-kindergarten

programs (Stipek, 2005). If government programs continue to be promoted and funded throughout the United States, policy makers and school administrators will benefit from knowing how their program compares to other forms of childcare and if data supports their funding decisions for government funded early intervention and family support programs. To date, there has been very little research focused on the impact relative or non-relative care in the home has on later reading achievement. However, many families are choosing to return to relative care in the home because based on personal experiences, they believe it is the best choice for their child (Shpancer & Bennett-Murphy, 2004).

Finally, this study provides one of the largest sample sizes for the age group examined in relation to reading achievement. Information gained from these and other successful early education backgrounds could also aid in improving the government funded programs. In addition, other stakeholders, such as parents, caregivers, and preschool teachers, would benefit from knowing which early childhood educational experiences produce the greatest academic gains in young children. This study plays a vital role in determining if the type of preschool experience impacts reading achievement in kindergarten through fifth Grade.

CHAPTER II

LITERATURE REVIEW

The growing impact of preschool education on school readiness and achievement prompts educators to explore which early childhood experiences or programs are best in preparing preschoolers to be successful as they enter the formal school setting. The early childhood years are increasingly being acknowledged as a sensitive period of time for the development of cognitive, language, and literacy skills. In addition, research indicates that these skills seem to be molded by family and child characteristics, child care, and early classroom experiences (Morrison & Cooney, 2002; National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network [ECCR N], 2002). The reading and knowledge skill base that a student possesses upon entering kindergarten has been found to be a dependable predictor of academic success. Children who come from literacy rich home environments demonstrate higher reading skills and knowledge than other students. One group of researchers found that a relationship existed between academic success and home literacy environment in both kindergarten and first grade, even after controlling for study variables such as the children's race/ethnicity and socioeconomic status (Denton, West, & Walston, 2003). In order to determine which early childhood settings contribute to later reading achievement, it is important to first understand the five types of early education examined in this study, examine the history of early childhood education, the belief systems that have inspired them, and the previous research in the area of study.

History of Early Childhood Education

While preschool programs first appeared in the U.S. in the 1920s, they did not truly begin to develop and expand until the late 1950s and early 1960s. Initially, they were developed as a result of the perceived widening achievement gap among upper and middle class children and young children growing up in poverty. During this time, a pattern seemed to develop in the belief that children who attended preschool or nursery school experienced higher levels of intellectual development. Initially, the early childhood community was reluctant to acknowledge the belief that nursery school attendance could have an influence on intellectual development (Caldwell & Richmond, 1968), but over time changing views led to more positive reconsiderations. Another view of the Iowa research (Skeels & Dye, 1939; Wellman, 1940; Skodak & Skeels, 1949; Skeels, 1966) along with other studies emerged (Spitz, 1945; Spitz & Wolfe, 1946). Support for renewed emphasis on the environment in the early years was later provided by the research of Kirk (1958), Hunt (1961, 1964), and Bruner (1962). Bloom (1964) contributed one of the greatest influences as he argued that development was most easily influenced by the environment during rapid growth periods and that by age 5, half of an adult's intelligence was developed. Theoretical support for environmental influence came from the research of Locke, Rousseau, Pestalozzi, Froebel, Montessori, Piaget, Vygotsky, and Maslow.

John Locke was one of the first philosophers to write about the influence of the environment on children. He was best known for his theory of the mind being like a blank tablet. By this reference to a blank tablet, he meant that environment and experience form the mind in a literal sense. Locke believed that children develop as a

result of the stimulation they receive from parents, caregivers, and experiences in their environment (Morrison, 2008).

Jean-Jacques Rousseau was also one of the first philosophers to write about the role the environment played in educating the child and child centered practices. He believed that children are born good and society corrupts them. He was interested in the physical development of children and believed it was important for infants to have opportunities to use their senses to explore their environment (Compayre, 1907/1971). Rousseau believed in the importance of early education and that schools should be based on the interests of the child (Graves, Gargiulo, & Sluder, 1996).

Influenced by Rousseau, Johann Heinrich Pestalozzi also believed that children were born with goodness (Latham, 2002). He applied many of Rousseau's ideas at his school in Switzerland where he emphasized the natural childhood developmental stages and sensory education. Initially, Pestalozzi believed that the home was of critical importance in educating children and later came to believe that both home and school environments were essential for their education (Anderson, 1974).

Friedrich Froebel was also influenced by Rousseau as a student of Pestalozzi (Archer, 1928). He also believed that children were naturally good and that education should be guided by the nature of the child. Froebel displayed his belief in the influence of environment by establishing these principles in his kindergarten (Archer, 1928). He also believed that the home environment was critical in the lives of children. In Froebel's kindergarten, he incorporated the belief that children learn by being active, and the belief that the curriculum and the stages of development should match. He also incorporated play as a vital part of the curriculum (Rippa, 1997).

Traditionally, education has been a teacher-centered approach. The teacher was viewed as the keeper and dispenser of knowledge. However, this historical view of education began to change in the beginning of the twentieth century. John Dewey (1916), often referred to as the founder of the school of thought called progressivism, believed that children should be socially active in the classroom environment, engaged in physical activity, and should be allowed to discover how objects work (Graves, 1990). He advocated the child's interaction with the total environment. Dewey believed that from a child's own activity and play emerged intellectual skills (Dewey, 1916).

The work of Maria Montessori also contributed to the field of early childhood education. Montessori believed that children learn best through direct sensory experiences. She was also convinced that children have a natural tendency to explore and attempt to understand their world (Graves, 1990). To promote learning, Montessori developed an orderly and prepared learning environment, which she believed served children in teaching themselves (Montessori, 1965).

Jean Piaget, known as a leader of the twentieth century, believed that children construct their own knowledge by connecting meaning to the places, people, and things in their world (Mooney, 2006). He believed that children learn through active involvement (Morrison, 2008). His theory stated that through interaction with the environment, children organize, structure, and restructure experiences and grow mentally. Therefore, the quality of the environment and the nature of a child's experiences contribute significantly to intelligence (Morrison, 2008).

Abraham Maslow (1970) also contributed ideas concerning environmental influences from a different perspective. Maslow believed that when children are in an

adult's care, that adult is responsible for making sure their needs are met. He believed that children's needs vary and can be arranged in different levels, where each need builds on the previous need (Maslow, 1970). This means that if an adult is not able to meet the basic needs of a child, they will not be motivated to develop needs at a higher level. For instance, if a child is hungry, it will be difficult for him or her to concentrate and focus on learning in a lesson (Maslow, 1970).

Lev Vygotsky (1978) also shared thoughts and ideas concerning environmental influences and how children develop. While he believed as Piaget that children construct knowledge from personal experience, he also believed that personal and social experience cannot be separated. He believed that children inhabit the environment in which they live, and that environment is shaped by their communities, socioeconomic status, families, education, and culture. Their understanding of this environment comes partly from the beliefs and values of the children and adults in their lives (Mooney, 2006).

In the 1960s and 1970s, preschool programs continued to develop and build on these works, but also took views and practices from a wide variety of traditions in education and psychology. While the programs emphasized their potential cognitive benefits for the child, the majority also had as their goal the well-being and development of the whole child (Day & Parker, 1977). In the early years, programs often had to address concerns that the social and emotional development of young children might be negatively impacted as a result of children being separated from their mother too early (Caldwell & Smith, 1968). Model programs were initially developed for the specific purpose of investigating the potential for preschool programs to impact the development and learning of children from disadvantaged low income families. Much of what is

known today about preschool education and its influences comes from the past rigorous studies of these model programs (National Research Council, 2001).

Relevant Studies

Many studies have been conducted in the past 40 years to examine the short-term and immediate (one to two years) effects of programs on the development and learning of children from low-income families. Most of the research suggests that the programs produced meaningful gains in social, cognitive, and emotional development during the preschool years (McKey et al., 1985; Ramey et al., 1985; White & Casto, 1985). The public preschool programs have also been able to successfully provide encompassing services to improve children's nutrition and provide access to dental and medical services (Fosburg et al., 1984; Hale et al., 1990; Barnett & Brown, 2000).

Preschool programs with the greatest effects initially on development and learning were those that provided the largest amount of services. These programs operated for more hours per year, continued for more years with a higher staff-to-child ratio, which was one to three for infants and one to six for three and four-year-olds, and whose staff was highly qualified (Frede, 1998; National Research Council, 2001). While many agree that preschool programs impact the learning and outcomes of children who attend, there have also been some who disagree about the extent to which these effects persist (McKey et al., 1985; Woodhead, 1988; Haskins, 1989; Locurto, 1991; Barnett, 1998). In many studies, some of the estimated effects decrease over time and are often negligible after children have been gone from the program for several years (McKey et al., 1985; Ramey et al., 1985; White & Casto, 1985). Some scholars have urged or hypothesized that this fade-out likely occurs because there are weaknesses in the schools that the disadvantaged

students attend after leaving the preschool programs (Lee & Loeb, 1995). Others (Herrnstein & Murray, 1994) believe that public preschool programs similar to Head Start fail to improve cognitive functioning, while the more expensive and intensive programs may be likely to do so. However, after more closely examining the results of these studies, it becomes apparent that while the effects on intelligent quotient (IQ) decrease with time, the long-term positive effects on children's school success and learning seem to increase (Barnett, 1998).

There is much empirical evidence to suggest that these preschool programs have served disadvantaged children well over the long term by preventing unwarranted special education placements and grade repetitions. Barnett's (1998) review of more than thirty longitudinal studies indicated that preschool programs serving disadvantaged children resulted in long-term increases in achievement as measured by standardized tests. In coming to this conclusion, Barnett heavily relied on the results of controlled experiments that had sound longitudinal follow-ups that lost few participants over time. The studies which examined high school graduation rates found large contributing effects as well (Barnett, 1998).

Examination of programs that researchers developed for the specific purpose of investigating the influence of preschool education on economically disadvantaged children serve as a good source of information concerning the positive influences of preschool programs on development. These programs have been determined to be effective in producing short-term benefits for children and in producing long-term benefits in a dozen or more longitudinal studies. Many of the studies with the strongest outcomes were the highly controlled random assignment experiments. Additionally, in

comparison to public programs that are less well funded and as a result more constrained in quality, these programs seem to return larger effects and provide models for best practices (Frede, 1998; Lazar et al., 1977). As researchers set out to develop model programs, they drew from a wide range of theoretical and practical beliefs that have influenced early childhood education in the United States. The researchers examined views of such individuals as Froebel, Sequin, McMillan, Montessori, Dewey, Smith Hill, Gesell, Thorndike, Freud, and Piaget (Condry, 1983; Spodek, 1991).

Frede (1998) investigated the differences and commonalities within the model programs that reported evidence of long-term effectiveness. Present in the models this researcher studied were models subject to outcome studies occurring at least through elementary school. Their reports included a written description of their curriculum and classroom practice, and center-based preschool experiences for low-income children. After close analysis of these descriptions, Frede discovered the majority of the programs she studied utilized processes of learning and curriculum content, which developed knowledge, school-related skills, and a strong emphasis on language development. They also employed qualified teachers who used reflective teaching practices and were supervised by highly qualified individuals. The class sizes of the model programs were small and the ratio of teachers to children was low. For example, two of the most well known programs, the High/Scope Perry Preschool and the Abecedarian programs, had class sizes of 12 to 13 children with two teachers (Weikart et al., 1967; Ramey & Campbell, 1984). Programming was intense, coherent, and a collaborative relationship with the parents was appreciated and encouraged (Frede, 1998). The High/Scope Perry Preschool Program, which offered one or two years of preschool intervention, and the

Abecedarian Project, which offered educational intervention from birth to age 5, has resulted in amazing effects of the program into adulthood (Schweinhart et al., 1993).

The High/Scope curriculum model is one of the most widely adopted preschool curriculums to emerge during the beginning years of Project Head Start (Hohmann & Weikart, 1995). High/Scope offers children active engagement in preparing and planning their learning. It also provides them with the opportunity to extend language and develop concepts through representing and experiencing different aspects of seriation, classification, number, time, and spatial relations (National Research Council, 2001).

The High/Scope program seeks to give students skills to support the development of young children through school and into young adulthood. The program model also incorporates five strategies of belief in how children learn and develop: active engaged learning, adult-child interaction, consistent daily routine, provision of observational assessments, and creating an appropriate learning environment. The center of the High/Scope curriculum is the Plan-Do-Review sequence of the daily routine, in which children are given choices about what they will do during the day, allowance to carry out their ideas, and then encouragement to reflect on their activities with peers and adults (Substance Abuse and Mental Health Services Administration, n.d.).

The Abecedarian project was a scientific study of the possible benefits of early childhood education for poverty level children beginning in the early 1970s. The children were randomly assigned as infants to the control group or the early educational intervention group. The children in the intervention group received full-time, high-quality educational intervention in a childcare setting from infancy through age 5. Each child had an individualized program prescription of educational activities, which consisted of

games incorporated into the child's day. The activities focused on social, emotional, and cognitive areas, but gave specific emphasis to language. By age 21, the children who attended preschool had increased their reading achievement by 1.8 grade levels and had completed a half-year more of education. A higher percentage of children who attended preschool were enrolled in school (42% verses 20%), and had attended, or were still attending a four-year college (36% verses 14%) (The Carolina Abecedarian Project, n.d.).

Detailed curriculum used in the longitudinal studies was available for some programs (Bereiter & Engelmann, 1966; Garber, 1988; Karnes, 1972; Lally & Honig, 1977; Miller & Dyer, 1975; Palmer & Siegel, 1977; Ramey et al., 1985; Weikart, 1972; Weikart et al., 1967, 1978). While the data based on actual observations of teacher practices in the classroom are rare, the study by Weikart et al. (1978) provides an exception. On the basis of the descriptions, Frede (1998) was able to derive several generalizations about the content and process of the curricula used by the model programs.

In some of the classroom interaction time, the teachers used a discourse pattern that engaged the children in an "initiation-reply-evaluation" sequence (Mehan, 1979). For example, the teacher might ask, "What do you think might happen next in the story?" The child might reply, "The boy will run home." The teacher may then say, "Let's continue reading and see if you are right." In some of the studies (Cole et al., 1971; Wagner, 1978), the children were also introduced to strategies for remembering, such as categorizing and rehearsing. Although classroom interactions are different from the interactions most children experience in their home, the interactions were most different for the home environments of minority and low-income children (Heath, 1983).

While the philosophical models were dissimilar with respect to methods, the content of the program remained similar since they all pulled from traditional preschool and kindergarten practices in the United States. The programs emphasized language and the teachers provided a model of Standard English. The teachers also provided an environment full of opportunities and encouragement for children to learn to speak so they could be understood, understand others, and express concepts symbolically through speech (Frede, 1998).

These programs were also dissimilar in the area concerning the focus of the teachers and developers of the program. For instance, some of the teachers and developers placed their emphasis on cognitive development, while others focused most intensely on emotional and social development (Lazar et al., 1977; Day & Parker, 1977). In spite of their dissimilarities, the similarities mentioned earlier seem to be adequate to ensure that all of the programs developed significant gains in the area of cognition. While this is the belief, it is possible that the differences in the programs could have produced some differences in cognitive development and even to a greater extent, differences in emotional and social development (Frede, 1998).

Five Categories of Preschool Experiences

Taking these previous studies into consideration, the five categories of preschool education which are the focus of this study include: 1) the federally funded Head Start Program, 2) the care provided by a relative at home, 3) the care provided by a non-relative at home, 4) the center-based program, and 5) two or more different programs. The next section of this literature review will attempt to summarize each category, the research surrounding it, and the strengths and weaknesses of each.

The Federal Head Start Program

First, in this discussion is Head Start, a national program sponsored by the United States Department of Health and Human Services which focuses its attention on serving children from low-income families. Head Start was first created in 1965 as part of President Johnson's War on Poverty. In 1964, the Economic Opportunity Act authorized key programs to help meet the needs of preschool children from disadvantaged families (Kagan, 2002). In response to the request of the Federal Government, a panel of child development experts was selected to design the program which later became Project Head Start. It was first launched as an eight week summer program designed to help end poverty by providing preschool children from low-income families with a program that would meet social, health, emotional, nutritional, and psychological needs (Styfco & Zigler, 2003).

In 1969, Head Start was transferred to the Office of Child Development in the Department of Health, Education, and Welfare, which later became known as the Department of Health and Human Services. The Head Start programs are locally administered by non-profit organizations and school systems. The programs serve three to five-year-olds in the United States. Head Start's long term effectiveness has been under great scrutiny and controversy in recent years. It has received both critical and positive reports. In awareness of the controversy, Congress commissioned an Impact Statement concerning Head Start and its participants (Illinois Head Start Association).

Levitt and Dubner (2005) in their book *Freakonomics*, indicated that participation in Head Start has had no lasting effects on its participants' test scores in the elementary years of school. Levitt and Fryer's (2004) study also came to the same conclusion. In

fact, the most widely cited source in support of Head Start found that children who finish the Head Start program and are placed into disadvantaged schools perform even worse than their peers by the time they reach second grade. They report their belief that it is only by continuing to isolate these children by dispersing them and sending them to better-performing school districts can the improvements or gains be seen (Administrative History of the Office of Economic Opportunity, 2004). Another study by Lee and Loeb (1995) also reported very similar findings. They discovered that in comparison to other youngsters, the children who attend Head Start programs are also more likely to attend lower quality schools as measured by such criteria as the safety of the children, the overall social and academic climate, and the academic programs. They also found that the academic advantages of attending Head Start fade away during the first years of school due to the students attending schools that are not well resourced, at least in relation to the needs of their population of students (Munoz, 2001).

Over the years, there have also been many mixed reviews concerning Head Start. For instance, in 1995, Currie and Thomas tried to control for numerous family background factors. The study was based on within-family data, comparing children in Head Start with their siblings who did not attend Head Start. The mothers who were themselves enrolled in Head Start were also compared to their adult sisters who were not enrolled in Head Start. The researchers analyzed the groups separately based on ethnicity (Caucasian, African American, and Hispanic). They discovered that Caucasian children who were the most disadvantaged were found to experience larger and longer lasting improvements than African-American and Hispanic children (Currie & Thomas, 1995).

Another mixed review study of Head Start (Magnuson, Ruhm, & Waldfogel, 2004) concluded that early education increased reading and mathematic skills upon school entry; however, they also found that it boosted the classroom behavioral problems of the children and reduced their self-control. The results also indicated that for most children, the positive effects of pre-kindergarten on skills greatly depleted by the spring of the first grade year, while the negative behavioral effects continued. Additionally, the study also discovered that, in contrast to the general population who attend pre-kindergarten, children attending schools with "low levels of academic instruction" and "disadvantaged children" had the greatest and most lasting gains academically from early education (Magnuson, Ruhm, & Waldfogel, 2004).

Magnuson and Waldfogel (2005) examined the effects of early childhood education on ethnic and racial gaps in preparing young children to enter school. They looked at how Caucasian, African American, and Hispanic children's educational experiences differed in early childhood education and care. Their results indicated that Caucasian children who attend preschool programs or care do enter school more ready to learn. Both the number of children enrolled in these programs and the quality of care they receive varies by ethnicity and race. Magnuson and Waldfogel (2005) found that while more African American children than Caucasian children entered preschool programs, they were also found to experience lower quality care. These researchers also discovered that the types of preschools they attended differed in that African American and Hispanic children are more likely to attend Head Start than Caucasian children. The authors conclude with their belief that substantial increases in the number of Hispanic and African American children enrolling in preschool programs, either alone or in

combination with an increase in preschool quality, could have the potential to narrow school readiness gaps, which leads readers to believe that they may see a need for improvement in the quality of Head Start programs (Magnuson & Waldfogel, 2005).

After reviewing and summarizing 31 studies, Datta (1979) noted that the program displayed an immediate improvement in the IQ scores of children participating, while after entering school, the non-participants were able to taper down the difference. The results of the study indicated that the children who attended Head Start were significantly more likely than their siblings to finish high school, attend college, and often have higher earnings in their early twenties. Additionally, the children who attended Head Start were less likely to have been charged or booked for a crime (Garces, Thomas, & Currie, 2002). Head Start has also been associated with significantly large gains in test scores and has been found to reduce the probability that a child will repeat a grade (Garces, Thomas, & Currie, 2002). The recent criticisms of Head Start have prompted plans to improve the program's services and to expand in a manner as to make the program more responsive to the children's and families' needs. Included in these new changes is the expansion below and beyond the ages that the program previously served (Zigler & Styfco, 1994).

As a result of the controversy, congress mandated an intensive study through the United States Department of Health and Human Services on the effectiveness of Head Start called the Head Start Impact Study. The study issued a series of reports on the design and target population of 5000 three and four-year-olds. Results of the first year of the study were released in June, 2005. Beginning in fall, 2002, the study participants were chosen and assigned to either the Head Start Program or other community resources selected by the parents. The study was designed to measure Head Start's effectiveness in

comparison to the variety of other forms of community support and educational intervention. First report findings indicated children who participated in Head Start demonstrated consistently small to moderate advantages compared to other programs with few areas where no advantage was reported. The benefits increased with early participation in Head Start and varied among ethnic and racial groups (Department of Health and Human Services, 2006).

Relative and Non-Relative Care at Home

Second and thirdly in this discussion are the early experiences children have with their family concerning relative and non-relative care at home. Characteristics of family structure have consistently been indicators of pre-academic skills, cognitive functioning, and later academic achievement (Bornstein & Tamis-LeMonda, 1989; Estrada, Arsenio, Hess, & Holloway, 1987; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Morrison & Cooney, 2002). The mother's level of education and family income are key elements of family structure that have been linked to young children's cognitive abilities, language development, and academic outcomes (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Duncan & Brooks-Gunn, 1997; NICHD ECCRN, 2000). An especially strong predictor of children's academic competence in kindergarten and first grade, even after accounting for other factors, such as maternal education, is the mother's sensitivity in parent-child interactions during play (NICHD ECCRN, 2002; Pianta & Harbers, 1996; Sameroff, Seifer, Baldwin, & Baldwin, 1993). In relation, a stimulating home environment is another robust family element that has been found to contribute to young children's cognitive and academic development (Bradley, Corwyn, Burchinal, Pipes McAdoo, & Garcia Coil, 2001). Overall, there has been a general concensus that

parenting quality and the stimulation of language skills make a greater contribution to the development of children than other contexts of early childhood (NICHD ECCRN & Duncan, 2003).

According to the Census Bureau of 1995, 30% of the 19.3 million preschoolers were cared for by a grandparent on a regular basis, and 17% were cared for by their fathers. However, there is very little literature available in these areas of the research. The largest area of relative care in the literature relates to mothers. The 1980's experienced a dramatic demographic shift in the patterns of the U.S. work force, with the majority of married women with children under the age of six participating in the work force (U.S. Census Bureau, 2002). By the middle of that decade, more than half (50.8%) of the women with children under one year of age and 55.4% of women with children under three years of age participated in the work force. While working mothers have become the norm in the United States, controversy still persists over the consequences of paid working mothers and children's development. The "underlying skepticism" that still exists today seems to imply that "maternal employment, even if the norm, is still not optimal" (Gottfried, Gottfried, & Bathurst, 2002, p. 209; Goldberg, Prause, Lucas-Thompson, & Himsel, 2008, p. 77).

Impact of Working Mothers

Several surveys collected concerning public opinion express the nation's uncertainty concerning maternal employment. Interestingly, the wave of public opinion shifted from the 1970s to the 1980s as more and more mothers entered the work force. In a 1977 survey, 48.9% of Americans either strongly agreed or agreed that working mothers could establish as warm and secure of a relationship with their children as a

mother who did not work (Davis, Smith, & Marsden, 1999). The majority of Americans (62.5%) surveyed in 1988 also agreed, and this consent held through the next decade (1998: 67.7%). However, both in 1988 and 1994, the majority of Americans contradicted themselves and reported that when a mother had a child under school age, they should stay home rather than work for pay (Davis et al., 1999). Some believe that these results may have stemmed from the parenting perspective and advice of the mid-nineteenth century (Goldberg et al., 2008). This perspective of maternal depriving (Gottfried et al., 2002), implied that the psychological, cognitive, and emotional development of young children would be negatively impacted if the child was separated from the mother, and the mother was not present to meet their physical and emotional needs continuously (Bowlby, 1952; Frailberg, 1977).

Before maternal employment was the norm, educational level and social class were not similarly distributed in groups of non-employed and employed mothers. This often confounded or confused SES and maternal employment in research on the effects of working mothers on children's achievement (Beyer, 1995; Hoffman, 1984). One study discovered when controlling for maternal education and income that maternal employment relates positively to children's achievement (e.g., Blau & Grossberg, 1992). There have been other findings which indicate no connection between maternal employment and achievement (e.g., Desai, Chase-Lansdale, & Michael, 1989), and others report negative associations (e.g. Baum, 2003; Farel, 1980). In all fairness, it is important to note that including indicators of demographics as control variables may change the study outcomes. For instance, Farel's (1980) study concluded that maternal employment was correlated with children's lower academic achievement. In the recent analysis of a

national data set, Baum (2003) discovered that maternal income in part lessened the negative effects of early maternal employment on cognitive outcomes. In the working class homes and in the welfare-eligible families, the additional income from the mother's employment was discovered to increase financial security and help ensure children's basic needs. Additional income also increases learning opportunities and children's material resources, while lessening the family stress which are advantageous to children's achievement (Beyer, 1995).

In a 1992 study on maternal employment in low-income families, Vandell and Ramanan found positive effects on children's reading and math scores. Although, when maternal employment was not financially necessary, the lack of availability and supervision, decreased maternal attention, and the possibility of less enriched alternative care settings provide opportunity for negative effects of maternal employment on achievement. In fact, a large national study indicated unsupervised after school time as an explanatory connection between lower mathematics achievement scores among eighth graders and maternal employment (Muller, 1995; Goldberg et al., 2008).

In the literature, many characteristics of the samples, such as age of the children, were found to alter the outcome of various studies. The age of the child has been associated with both positive and negative study outcomes in relation to the child's achievement and maternal employment. For example, a mother working when her child is a young infant has been associated with negative cognitive outcomes (Brooks-Gun, Han, & Waldfogel, 2002). It is believed that young children may be negatively impacted by the absence of the mother for extended periods of time due to employment. However, this negative impact can be offset by non-maternal high quality care. By the time the child

reaches later childhood and adolescence, the historically first family influence may be substituted in part by the influence of peers and schools (Baum, 2003) and the care experiences out-of-school (Coley, Morris, & Hernandez, 2004). During this time, the decreased supervision by the mother may increase the risk for children, especially males, to be exposed to negative peer influences and become involved in unhealthy activities (Crouter, McDermid, McHale, & Perry-Jenkins, 1990; Montemayor & Clayton, 1983).

When researching the amount of time mothers spend at work, the findings, using the index of intensity of employment, had mixed results. Some studies reported that children of mothers who worked part time reached higher levels of academic achievement than children of mothers who worked full time (Hutner, 1972; Moorehouse, 1991). There were also studies that indicated that neither full-time nor part-time working mothers were significantly related to the achievement of children (Leibowitz, 1977; Rosenthal & Hansen, 1981). Still, other research points to the developing of benefits for children's achievement as the intensity of the mother's work increases. In a 1972 study, Woods reported that children of full-time employed mothers attained higher levels of academic achievement than children of mothers employed part-time. In opposition, Parcel and Menaghan (1990) found that overtime work had a negative association with achievement in relation to full-time and part-time work.

The time of a child's life in which a mother works also plays an important role in student achievement with some researchers finding negative effects of mothers working early in a child's life on children's formal achievement and verbal abilities (e.g., Baum, 2003; Baydar & Brooks-Gunn, 1991; Ruhm, 2004). The consequences of mothers working early in a child's life may render negatively due to the reduced quantity of

maternal time available to the young child and the risk of poor quality, non-maternal child care available. However, these negative results of early employment have not been found consistently (Baum, 2003). A couple of studies reported some interesting findings concerning maternal employment. They found that when the mothers work status and work preference matched, more positive effects of early maternal employment appeared. In contrast, if a non-employed mother would prefer to be working, they discovered that they were more likely to become withdrawn and depressed, and their parenting actions or behaviors may become altered or negatively impacted (Hock & DeMeis, 1990; Parcel & Menaghan, 1994).

Preschool Literacy Experiences

In 1991, Scarborough, Dobrich, and Hager published a study examining the preschool literacy experiences and later reading achievement of 56 middle-class children. The parents of the children were also questioned about their frequency of adult reading, parent-child reading, and their child's solitary reading related activities in the home. The students were observed during their preschool years and again at the end of their second grade year. The results indicated that the 22 preschoolers who became poor readers had less frequent early literacy-related experiences than the 34 children who became better readers (Scarborough, Dobrich, & Hager, 1991).

Another 2006 study by Downer and Pianta also found preschool experiences to play a significant role in reading achievement in first grade. The study focused on family and child care experiences from birth to 54 months, maternal sensitivity at first grade, achievement and social competence at entry to school, and qualities of first grade classrooms and whether they predict academic and cognitive functioning for 832 first

graders. Repeated assessments of functioning in the two year period remained relatively stable and indicated that family income-to-needs ratio, child gender and race, maternal education and sensitivity, and home learning environment were significant predictors of academic and cognitive ability (Downer & Pianta, 2006).

Two or More Different Programs

Fourth in the discussion are children who attend two or more different programs. The United States Census Bureau of 1995 reported that children under five years of age were being cared for less often by their parent or another relative as compared to the 1985 report. Nearly half of all preschoolers in 1995 (those whose mothers worked and did not work) experienced more than one type of childcare arrangement each week, with each child averaging two arrangements. The most common combination of childcare was the child attending an organized childcare facility and childcare provided by an individual not related to the child (Jacobson, 2000).

The Urban Institute (2000) reported that nearly 40% of children age five or younger are in two or more non-parental childcare arrangements each week. They also discovered that low income children were not any more likely to be in multiple childcare arrangements than high-income children; however, they did find that age made a difference. Infants and toddlers were three times less likely than three and four-year-olds to be in three or more arrangements. In the cases they studied, over fifty percent of three and four-year-olds in the states of Washington, Minnesota, Michigan, and New York had more than one childcare arrangement, while in California only thirty-five percent had more than one arrangement. Two thirds of the children under age five who experience multiple childcare arrangements have a combination of formal or informal care. Formal

care refers to center-based or family childcare centers and informal care refers to relative care or baby-sitter. They discovered that three and four-year-olds are more likely than infants and toddlers to experience a combination of formal arrangements exclusively (Urban Institute, 2000).

The Day Care Center

Fifth in the discussion are children who attend day care centers. High-quality early childcare also seems to promote children's development of academic and language skills before school entry, even above the effects of the family environment as an added value factor (Burchinal et al., 2002; NICHD ECCRN, 2000). In a 1987 research study, Sevigny studied the long term effects of a preschool program. Students who participated in a 1973-74 Chapter I preschool program were compared with an equal amount of students who were not in the preschool program. The two groups were followed for the thirteen years of K-12 formal schooling and analyzed. Sevigny (1987) discovered that the preschool group achieved at a higher level and in grades 3-11, they outperformed the other group on standardized reading tests. The preschool group also displayed better school behavior and had higher grade point averages (GPA). While the differences in mathematics scores were not as dramatic, the preschool group did score higher in grades four through eight. The non-preschool group required more compensational educational services for underachieving students and also had more violations of the school district code of conduct. At the end of the thirteenth year, 54% of the students who attended preschool graduated whereas only 14% of the students who did not attend preschool graduated (Sevigny, 1987). Research by Prince, Hare, and Howard (2001) also led to a similar finding. After conducting their own research, they found that children who

attended preschool had fewer referrals to special education services and graduated more often than similar students who did not attend preschool.

One study by Bergan and Feld (1992) examined data taken from a long-term National Child Care Research Program initiated in 1990. One of the components of the study was to document the development of children in licensed center-based child care. During the first phase of the research, data were collected on 1,480 children in 122 child care centers in 15 states. Information was gathered on the child, their family, teacher, and program by telephone interviews. In addition, the child's mathematics, reading, and science abilities, and social skills were assessed in the classroom using developmental assessment scales. Children's abilities increased from their initial assessment to the progress assessment (Bergan & Feld, 1992).

In Ramey and Ramey's (2004) research study, they review evidence from randomized controlled trials (RCTs) designed to test whether preschool education, with an emphasis on seven particular areas of experiences, could be beneficial in improving school readiness and academic achievement in reading and math. The results indicated that the cumulative developmental toll reliably measured in high-risk children beginning at age two can be significantly reduced through a high-quality preschool program. They reported that this positive effect has been replicated in nine additional trials using RCT methodology. Long-term follow-up of the study participants indicates that in addition to the improved performance in reading and mathematics in elementary and secondary school, a reduction in grade retention and special education placement was also found (Ramey & Ramey, 2004).

A current study examined children's growth in social skills and school-related learning during the pre-kindergarten year in state funded preschool programs designed to prepare children for kindergarten. The authors expected to attribute children's gains in these areas to variations in structural and classroom process. Twenty-eight hundred children were selected randomly from nearly seven hundred state-funded preschool programs in eleven states. However, they found that the gains in social skills and school-related learning were not related to the child or program, but rather to higher-quality instruction or closer child-teacher relationships (Howes, Burchinal, Pianta, Bryant, Early, Clifford, & Barbarin, 2008).

While the majority of studies have reported the positive influence of preschool on academic achievement, there are a few that do not fall into this category. For instance, in 1991, Bowlin and Clawson investigated the effect of a preschool program on the reading and math achievement of 208 first through fourth grade students. The population of students were all Caucasian and from low to middle socioeconomic classes. The experimental group was made up of all the children who attended preschool and the control group was made up of randomly selected students from the four grades that did not have preschool experience. The researchers hypothesized that students who had attended preschool would score significantly higher in reading and math on the comprehensive test of basic skills (CTBS) than the children who did not attend preschool. However, their findings did not support the hypotheses. They found that the students who had attended preschool did not score significantly higher on the CTBS in reading and math (Bowlin & Clawson, 1991).

Another area of center-based care that has become popular in recent years is before and after school programs. The increased participation of parents, especially mothers' of young children and single parent families in the work force increased expectations and need for out-of-home care of school-aged children (Rossi, 1996). In 1991, 7.6 percent of children aged 5-14 years old were estimated to care for themselves or be unsupervised by an adult while their mothers worked at least part of the time (Casper, Hawkins, & O'Connell, 1994). The data indicates that there was an increase in the number of extended-day programs available in schools from 1987-1988 to 1990-1991. The data also shows that these programs continued to be more available in private verses public schools, urban verses rural, and in medium to high minority verses low minority schools (U.S. Bureau of the Census, 1994; Rossi, 1996).

This chapter represents relevant literature concerning preschool educational experience and reading achievement. It reviews preschool programs offered through: 1) Head Start, 2) relative care at home, 3) non-relative care at home, 4) center-based care, and 5) two or more different programs.

CHAPTER III

METHODOLOGY

Introduction

This study examined the reading achievement of students from kindergarten through the fifth grade based on pre-school education by: 1) a Head Start Program, 2) relative care at home, 3) non-relative care at home, 4) a center-based program, and 5) two or more different programs. This chapter will explain the methods that were utilized by the researchers of the ECLS-K, which is a nationally representative sample of approximately 21,000 children who entered kindergarten in the fall of 1998. It is an ongoing study that focuses on children's early school experiences beginning in kindergarten and following them through middle school (Rock & Pollack, 2002).

This chapter describes the research design chosen, the participants in the study, the data collection procedures used for the ECLS-K study, the instrumentation used to measure the variables, how missing data was handled, and the data analysis procedures.

Participant Sample

The study analyzed data from the ECLS-K data file taken from the National Center for Educational Statistics (NCES): 06 CD-ROM Electronic Codebook, 2006 (NCES, 2006). The ECLS-K presents data from sampled students in the base year of kindergarten (1998-1999), the first grade year (1999-2000), the third grade year (2001-2002), and the fifth grade year (2003-2004). These four years of data collection were utilized by the researcher in the current study to analyze the research questions. The data were analyzed both longitudinally, kindergarten through fifth grade, and by individual grade cohorts (kindergarten, first, third, and fifth grade). The data answered questions

relating to the pre-school education and reading achievement. These questions relate to the four individual grade cohorts mentioned earlier and the 271 students who were followed by the NCES from kindergarten through fifth grade.

The sample for the study included a total of 2,597 students from five different early childhood educational backgrounds. The longitudinal study included 271 of these students. The children who participated in ECLS-K participated in both part-day and full-day kindergarten programs and came from both public and private schools. They also came from various racial/ethnic, socioeconomic, and language backgrounds. The children were provided pre-school education by either a Head Start Program, relative care at home, non-relative care at home, a center-based program, or two or more different programs. The children's schools, teachers, and parents also participated in the study with data being collected from each in a variety of formats (Rock & Pollack, 2002).

Kindergarten Base Year Sample – 1998-99

The ECLS-K employed a multistage probability sample design to choose a nationally representative sample of children attending kindergarten in 1998-99. In the base year, primary sampling units (PSUs) or geographic areas consisting of counties were chosen and then schools within these areas were selected to participate in the study. The final selection procedure was selecting individual students within the kindergarten class to participate. During the base year, data were collected during the fall and the spring (Rock & Pollack, 2002).

First Grade Sample – Spring 2000

The student freshening for the spring-first grade utilized a half-open interval sampling procedure. The procedure was implemented in the same 50 percent subsample

of ECLS-K base year schools where movers were flagged for follow-up. Each of these schools was asked to prepare a roster in alphabetic order of students enrolled in first grade and the names of ECLS-K kindergarten-sampled children were identified on this list. Beginning with the name of the ECLS-K first kindergarten-sampled child, school records were checked to see whether the student directly below in the sorted list attended kindergarten in the United States in fall 1998. If not, (1) that child was considered to be part of the freshened sample and was linked to the base year sampled student (i.e., was assigned that student's probability of selection), and (2) the record search procedure was repeated for the next listed child, and so forth. When the record search revealed that a child had been enrolled in kindergarten the previous year, that child was not considered part of the freshened sample and the procedure was resumed with the second base year ECLS-K sampled student name, and so forth. The students who responded during the base year were automatically eligible for the first-grade data collection and nonrespondents were not eligible. However, the fall-first grade was limited to a thirty percent subsample in order to allow for freshening of the sample to include the current first-graders who had not been enrolled in kindergarten in 1998-99, and therefore, had not been presented with the opportunity of being included in the ECLS-K base year kindergarten sample. This group of students includes children who skipped kindergarten completely, children who were in first grade in 1998-99 and repeating the grade in 1999-2000 (Tourangeau et al., 2005). Approximately, half of sampled students who had transferred from their kindergarten schools were followed for both fall and spring-first grade. These freshening procedures entered 165 first graders into the ECLS-K sample,

which increased the weighted survey estimate of the amount of first graders in the United States by approximately 2.6% (Tourangeau et al., 2005).

Third Grade Sample Freshening Procedures-Spring 2002

The spring-third grade sample of children included all children who were base year respondents and children who were added to the sample in spring-first grade through the sample freshening procedures. Sample freshening was not implemented in third grade due to new students not entering the sample (Tourangeau et al., 2005).

Fifth Grade Sample-Spring 2004

The sample of fifth grade students included students affiliated with the following types of schools: public, private, Catholic, non-Catholic, religious, and non-religious. The ethnicity and races of students included Black; White; Hispanic, with race; Hispanic, without race; Pacific Islander; Asian; Native American; multirace; and unknown. The location of the sectors of education included mid-size city, large city, urban fringe of large city, urban fringe of mid-size city, large town, small town, and rural. This study is national and located within the 50 states and the District of Columbia. The regions represented are West, South, Northeast, and Midwest (Tourangeau et al., 2005).

The NCES researchers and colleagues identified four groups of students that were not followed in the spring-fifth grade sample. The following procedures of subsampling were not respective of other procedures implemented during the sixth wave (fifth grade). The following types of fifth grade students were deemed ineligible in the ECLS-K:04 study: (a) children who became ineligible in an earlier round (because of death or moving out of the country), (b) children who were subsampled out in previous rounds because they moved out of the original schools and were not subsampled to be followed, (c)

children whose parents emphatically refused to cooperate (hard refusals) in any of the data collection rounds since spring-kindergarten, and (d) children eligible for the third-grade data collection for whom there are neither first-grade nor third-grade data. Among the 21, 357 children who were eligible for the study after the base year, 5,214 were excluded from the fifth-grade survey (Tourangeau et al., 2005).

Subsampling follow-up procedures were developed for the students who moved from their original schools during fifth grade or earlier. The percentage of subsampling was less in fifth grade than in any other grade due to efforts to restrain the costs of data collection. The subsampling percentages extend the amount of longitudinal data available for principal analytic groups. English Language Learners were subsampled at higher percentages and remained a highly intriguing analytic group, while other students were subsampled at diverse percentages depending on the longitudinal data available for those students (Tourangeau et al., 2005).

In addition to the technique mentioned above, the NCES also used other methods specific to the fifth grade sample. A new feature of the fifth-grade-sample is the subsampling of children for the administration of the mathematics and science questionnaires. When all of the children retained for the fifth-grade data collection had child-level questionnaires filled out by their reading teachers, half were subsampled to have child-level questionnaires filled out by their science teachers and the other half had child-level questionnaires filled out by their mathematics teachers. This method only affects the computation of the combined child-parent-teacher weights (Tourangeau et al., 2005).

Overall, 10, 590 children participated in all four years of the ECLS-K data collection. Two thousand eighty-four students represent original private schools and 8,506 students represent original public schools, which make up fifty percent of the base year respondents (Pollack et al., 2005a).

Nonresponse and change in eligibility status of participants is common in longitudinal studies, therefore, the amount of decreases with each round of data collection is expected. The field and sampling procedures of the ECLS-K that were applied resulted in an increase of the sample after the fall-kindergarten data collection, but decreased in each wave or round that followed (Tourangeau et al., 2005).

Instrumentation

NCES staff and representatives contracted from Westat Educational Testing Services and the University of Toledo designed the data collection instruments (Tourangeau et al., 2005). The instrument designers trained and consulted teachers, curriculum specialists, and academicians concerning the development and design of the assessment instruments. They addressed issues such as test specifications, domains, individual item content and presentation, test specifications, time allotted for each section or item, and mode of assessments. The advice of this team of experts served to limit the burden on students and teachers while ensuring valid representation of domain content. The direct cognitive assessments used the same procedures throughout the four rounds of data collection (K-5th grade). The longitudinal design of the study required that a vertical scale (one on which the scores of kindergartners to fifth graders can be placed) in each subject area be developed that can support the measure of valid change scores. This type of scale would allow one to compare achievement levels across grades and to quantify the

gains children make from year to year (Rock & Pollack, 2002). Assessments for direct cognitive measures were individually administered to each student and indirect reports of children's academic skills, behaviors, and attitudes were provided by educators (Tourangeau et al., 2005).

NCES utilized several procedures. The first procedure concerned the school-level refusal conversion in spring-kindergarten, resulting in a number of schools that agreed to participate in the study after having refused to do so in the previous round. One thousand four hundred twenty six children from these schools were sampled and added to the initial sample of 21, 387 kindergarten children. The second procedure concerned sample freshening in spring-first grade. This procedure added 165 eligible children to the sample of 21,192 base year respondents who remained eligible after the base year. A base year responding child was defined as one with at least one direct cognitive test score in fall or spring-kindergarten or one whose parent responded to the family structure section of the parent instrument in fall or spring-kindergarten. The third procedure was applied in first, third, and fifth grades and required that a subsample of children who moved out of their original sample schools not be followed into their new schools, resulting in a decrease in the sample. The fourth and final procedure was applied in fifth grade only. This procedure required the exclusion from the data the collection of children who were difficult to field, also resulting in a significant decrease in the sample (Tourangeau et al., 2005). The freshening procedures were explained earlier.

Cognitive Tests

The cognitive reading assessments for kindergarten, first, third, and fifth grades were the only cognitive test analyzed for the purposes of this study.

Kindergarten and First Grade Reading Assessment

The kindergarten and first grade reading assessments were designed at any given point to measure a single child's knowledge and to measure that child's academic growth on a vertical scale based on successive assessments. The assessments were also designed to provide criterion-referenced interpretations. In reference to the reading content domain, criterion-referenced proficiency scores can be used for two purposes: (1) they help with the interpretation of score level means by specifying what a child can or cannot do, (2) they are also helpful in measuring change at particular score points along the score scale, which provides a mean of evaluating the influence of children's experiences on changes in specific skill mastery. The reading assessment includes about 50 to 70 items per subject area test for each grade level. The kindergarten and first grade reading assessment begins with basic reading skills and vocabulary and moves toward reading comprehension skills in the third and fifth grades. The reading assessments are also adaptive in nature, meaning that a student is first administered a routing test that determines the difficulty of the second test they are given in reading. If a child does well on the routing test, he or she is likely to receive a second test that is more difficult and appropriate for their reading level. However, if the student does not do well on the routing test, the second test that is selected will be easier and more appropriate for their level (Rock & Pollack, 2002).

Third Grade Reading Assessment

The third grade reading assessment focused primarily on reading comprehension, with the largest portion of questions based on one of several reading passages. In addition, several questions hit on basic skills, including both vocabulary and decoding.

The third grade reading assessment also included items such as literal inference, making inferences, use of homonyms, identifying context clues, and evaluation skills. The children began the reading assessment with a 15 item routing test, 5 items of which were based on a short reading passage. The score on the routing test was then used to select one of three forms for the second stage. Each of the forms was of varying difficulty, with each form consisting of either 4 or 5 reading passages and associated questions, along with 5 or 6 individual decoding vocabulary items (Tourangeau et al., 2005).

Fifth Grade Reading Assessment

The fifth grade individual child assessments averaged 97 minutes in length and included many items from the third grade reading assessment such as identifying context clues, making inferences, literal inferences, use of homonyms, and evaluation skills. However, new items were also added in the fifth grade which formed a more difficult reading assessment. The students were also required to evaluate nonfiction and identify the tone of a remark or rather, the author's purpose of a selection or story (Torangeau et al., 2005).

Reading Assessment Specifications

The specific items of the reading assessment were adapted from the 1992 and 1994 NAEP Reading Frameworks (National Assessment Governing Board [NAB], 1994). The framework of NAEP is defined in terms of four types of reading comprehension skills: (1) initial understanding, (2) developing interpretation, (3) personal reflection and response, and (4) demonstrating a critical stance. Because the NAEP framework begins with fourth grade, modification by the literacy curriculum specialists and teachers was necessary to adequately accommodate the basic skills typically

emphasized in the earliest grades. Therefore, the ECLS-K added two additional skill categories to the NAEP framework: (1) basic skills (includes familiarity with print and recognition of letters and phonemes) and (2) vocabulary. However, after first grade, the emphasis placed on basic skill areas in the ECLS-K reading framework was decreased. Therefore, the skills in third and fifth grade are relatively close to the reading comprehension skills in the fourth grade NAEP. These conceptual categories found in Table 1 combine the NAEP reading framework with the recommendations of the literacy curriculum specialists (Pollack et al., 2005).

Data Collection Procedures

The base year data for the ECLS-K were collected in the fall and spring of the 1998-1999 school year. Two additional waves of data were collected in the fall and spring of the 1999-2000 school year. The first grade fall collection of data was confined to a 30% subsample of schools. The first grade spring collection was collected as a full sample. In the spring of the 2001-2002 school year, the fifth wave of data was collected. During this wave, the majority of the children sampled were in third grade. NCES notes that 89% of the interviewed children were in third grade during the 2001-2002 school year, 9% were in second grade, and less than 1% were in fourth grade or higher. During the spring of the 2003-2004 school year, 90% of the children interviewed were in fifth grade, 9% were in fourth grade, and less than 1% were in third grade (Tourangeau et al., 2005). All six waves of data collected were used for the present study. While there were data collected by NCES to provide clarity concerning practical issues and subject areas other than reading, for the purposes of this study, the reading assessment was the only cognitive test analyzed for each grade level (K, 1st, 3rd, & 5th).

Table 1

Reading Longitudinal Test Specifications for Kindergarten Through Fifth Grade: School Years 1998-99, 1999-2000, 2001-02, and 2003-04

Grade Levels	Total	Basic Skills	Vocabulary	Reading Comprehension Skills			
				Initial understanding	Developing interpretation	Personal reflection	Critical stance
			Percent of Testing Time				
Kindergarten	100	40	10	10	25	10	5
First Grade	100	40	10	10	25	10	5
			Percent of Test Items				
Third Grade	100	15	10	15	30	15	15
Fifth Grade	100	10	10	15	30	15	20

Note: The content strands are identical to the National Assessment of Educational Progress 1994 Reading Framework categories, with the addition of Basic Skills and Vocabulary. Basic Skills include familiarity with print, recognition of letters and phonemes, and decoding. Initial understanding requires readers to provide an initial impression or global understanding of what they have read. Developing interpretation requires readers to extend their initial impressions to develop a more complete understanding of what was read. Personal reflection and response requires readers to connect knowledge from the text with their own personal background knowledge. The focus here is relating text to personal knowledge. Demonstrating a critical stance requires the reader to stand apart from the text and consider it objectively.

SOURCE: U.S. Department of Education, National Center for Educational Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), fall 1998, spring 1999, fall 1999, spring 2000, spring 2002, and spring 2004.

(Pollack et al., 2005, pp. 2-9 - 2-10)

Validity of ECLS-K Kindergarten, First, Third, and Fifth Grade Direct Cognitive Reading Assessment

The validity evidence of the direct cognitive assessments was derived from several sources. The judgments of teachers and curriculum experts, a review of state and national performance standards, and comparison with commercial and state assessments all provided input to specifications of the test. Additionally, the comparison of the reading field-test item pool scores with those obtained from an established instrument also provided validity information (Tourangeau et al., 2005).

The ECLS-K test specifications were derived from several sources. The national and state performance standards were examined for each of the domains. The scope and sequence of materials from major publishers, as well as state assessments were also taken into consideration. The NAEP fourth-grade frameworks were modified for kindergarten, first, third, and fifth grades. An expert panel of early elementary school educators, including curriculum specialists in the subject areas and teachers at the targeted grade levels from different regions of the country, examined the pool of items and the recommended allocations. The assessment specifications indicated target percentages for content strands within each of the subject areas. These percentages were matched as closely as possible in developing the field-test assessment item pool as well as in selecting items for the fifth-grade assessment forms. Some compromises in matching target percentages were necessary to satisfy constraints related to other issues, including linking kindergarten, first, third, and fifth grade scales, avoiding floor and ceiling effects, and field-test item performance. This was specifically true for the reading assessment, whose structure (several questions based on each reading passage) placed an additional

constraint on the selection of items to match content strands. Experts in each of the grades and subject areas then reviewed the proposed fifth-grade forms for appropriateness of content and relevance to the assessment framework.

The construct validity of the reading and math assessments was addressed by the inclusion of the Woodcock-McGrew-Werder Mini-Battery of Achievement (MBA; Woodcock, McGrew, and Werder, 1994) in the spring 2000 field test of third and fifth grade items. Selected field-test forms that included reading sections also included the MBA reading test. Correlations were computed for the MBA scores with the theta estimates based on ECLS-K field-test responses. Test scores can be related to other measures only to the extent to which they are consistent within themselves. In general, a correlation between two variables cannot exceed the square root of the reliability of either variable. Reliabilities for the MBA were computed both with not-administered and omitted items treated as missing, and with these items treated as incorrect. The correlations of MBA with ECLS-K measures were quite close to the square roots of the reliabilities, indicating that the two assessments were measuring closely related skills. The correlations for third grade are presented in Table 2 and the correlations for fifth grade are presented in Table 3 (Tourangeau et al., 2005). While the method for reporting validity was not reported for kindergarten and first grade, it likely was assessed in much the same way as the other 2 years of the study.

Table 2

Validity coefficients for reading and mathematics field test item pools: School year 2001-02.

Category	Reading	Mathematics
Reliability of MBA (computed both ways)	.84 and .86	.81 and .82
Square root of reliability	.92 and .93	.90 and .91
Correlation of MBA x ECLS grade 3 field assessment item pool	.83	.84

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 third grade data collection, school year 2001-02. (Tourangeau et al., 2005, pp. 3-28)

Table 3

Validity coefficients for reading and mathematics field test item pools: School year 2003-04.

Computation	Reading	Mathematics
Reliability of MBA (computed both ways)	.73 and .77	.61 and .68
Square root of reliability	.85 and .88	.78 and .82
Correlation of MBA x ECLS-K grade 5 field test item pool	.73	.80

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), spring 2004. First reliability statistic is computed with not-administered and omitted items treated as missing; second statistic treats these items as incorrect.
(Tourangeau et al., 2005, pp. 3-32)

Reliability of ECLS-K Kindergarten, First, Third, and Fifth Grade Direct Cognitive Reading Assessment

The internal consistency (alpha) coefficients for the second-stage forms and routing test are presented in Table 4. These historical estimates of reliability (in the mid to high 80s for each round) of the routing test are quite high for a 20-item test. Due to the

restriction in range within the children sent to the various second-stage forms, the internal consistency coefficients for the second-stage forms were generally lower. The score variance and therefore, the alpha coefficient, are lower than they would have been if the entire sample of children would have taken each set of items because the children taking each of these forms are a more homogeneous group considering reading performance. The high-level second-stage form had much greater variance than the other forms and therefore was the only form in which the alpha coefficients came close or exceeded .90 (Pollack et al., 2005).

The Item Response Theory (IRT) theta scores are the most appropriate estimate of reliability for the full reading test. Inspection of Table 4 indicates that the reliability of the theta scores (ability estimates) ranges from .93 to .97. Since these reflect the internal consistency for performance on the combined first- and second-stage sections and for the full range of variance found in the sample as a whole, they are more appropriate estimates. One could expect the reliability of the scale scores to be similar to that of the thetas since they are a nonlinear transformation of the theta scores (Tourangeau et al., 2005).

Assessors were observed in order to make sure that they maintained the standard that they achieved at training. They were observed by their field supervisor at two different points in time. The first observation was to take place within the first 2 weeks of the field period and the second observation 2 to 3 weeks after the first. During the observations, the supervisor completed the Assessment Observation Form (see section 2 of Table 5: Assessment Observation Form), which rated the assessor on key areas of the assessment protocol. The supervisor simultaneously coded with the assessor those open-

ended assessment items that required judgment by the assessor to determine whether the child's answer was correct.

Table 4

Reading Assessment Reliabilities, Rounds 1 through 6: School Years 1998-99, 1999-2000, 2001-02, and 2003-04

Reliability measure	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
Alpha routing	.86	.88	.88	.86	.75	.88
Alpha low form	.69	.69	.71	.72	.83	.82
Alpha middle form	.70	.72	.74	.78	.84	.72
Alpha high form	.90	.88	.93	.92	.79	.76
Split-half: Decoding score	+	+	+	+	+	+
Split-half: Proficiency level 1	.83	.79	.77	.78	+	+
Split-half: Proficiency level 2	.76	.76	.73	.70	+	+
Split-half: Proficiency level 3	.72	.76	.76	.68	+	+
Split-half: Proficiency level 4	.78	.77	.80	.78	.56	+
Split-half: Proficiency level 5	.60	.69	.73	.73	.66	.64
Split-half: Proficiency level 6	+	+	+	+	.48	.51
Split-half: Proficiency level 7	+	+	+	+	.48	.48
Split-half: Proficiency level 8	+	+	+	+	.63	.64
Split-half: Proficiency level 9	+	+	+	+	+	.40
Reliability of theta	.91	.93	.95	.96	.93	.94
Percent agreement of highest Proficiency level mastered:						
Percent exact agreement	63	54	55	55	50	51
Percent exact + off by 1	96	94	94	95	95	95

+ Not applicable
NOTE: Statistics are unweighted. Approximately 90 percent of the round 6 children were in fifth grade during the 2003-04 school year, 9 percent were in fourth grade, and about 1 percent were in third or other grades. Statistics are unweighted. Statistics for IRT-based scores (percent agreement and reliability of theta) may be different from those in earlier reports due to recalibration of longitudinal scales.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), fall 1998, spring 1999, fall 1999, spring 2000, spring 2002, and spring 2004.
(Pollack et al., 2005, pp. 4-15)

After the child was escorted from the room at the end of the assessment period, the supervisor and the assessor reviewed the assessor's overall performance. The assessor and supervisor also compared the way that they each handled the open-ended questions.

If there were large differences, they reviewed the items carefully (Tourangeau et al., 2005).

The Assessment Observation Form had the case ID observed, the names of the supervisor and assessor, the observation number, and the date the observation was conducted. The form had two different sections: section 1 was used by supervisors to rate the assessor on key overall skill areas, such as building rapport, using neutral praise, responding to behaviors presented by the child, pacing appropriately, and coaching. In section 1 the supervisor checked "No" for each skill area that the assessor did not demonstrate appropriately (Tourangeau et al., 2005).

Table 5

Section 1 of the Assessment Certification Form: School Year 2003-04

Evaluator: As the assessment is administered, record whether or not the assessor successfully performed the following behaviors. Check "No" if the assessor makes 3 or 4 errors and needs to make improvements.

SECTION 1: Rapport building and working with the child

Q:	Did the assessor....	No
1.	Establish rapport with the child?	
2.	Use appropriate response to DK responses from the child?	
3.	Use neutral praise?	
4.	Respond to behaviors presented by child?	
5.	Avoid coaching the child?	
6.	Appropriately pace the assessment?	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), spring 2004.
(Tourangeau et al., 2005, pp. 4-65)

Specific questions from each routing and subdomain (e.g. reading) form were listed in section 2. The supervisor recorded both the child's response and whether the assessor did not demonstrate the specific required administration skills for that question. The required administration skills included using appropriate probes, reading questions

verbatim, and using appropriate hand motions. The supervisor checked a box indicating which skill was not performed for each question in which the supervisor observed that the assessor did not demonstrate the required administration skill(s) (Tourangeau et al., 2005).

Table 5

Instructions for Section 2 of the Assessment Observation Form: School Year 2003-04

SECTION 2: Specific Assessment Activities
Supervisor/Evaluator: Code the items as the assessor administers the assessment.
Code the child's response as the item is administered.
If the item requires probing, check the box if the assessor does not use the appropriate probe.
Check the box in the "Verbatim" column if the assessor does not read the item exactly as worded on the screen.
Check the box in the "Gesturing" column if the assessor does not use appropriate hand motions.
For each validation code item, check the box in the "Validation" column if the response coded by the assessor is not what you have coded.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), spring 2004.
(Tourangeau et al., 2005, pp. 4-66)

Assessor Interrater Reliability

Field supervisors completed an assessment certification form for each observation they conducted. One important element of this form was the "validation items." Every assessment included at least one item that both the observer and the assessor scored, with the exception of the reading routing test. These items contained open-ended responses that required interpretation on the part of the assessor to determine whether a child's response was correct. A measure of interrater reliability was obtained by comparing the measure to which observers and assessors agreed on scoring these validation items. The measure of the accuracy of the assessor's scoring compared with the standard (the observer's) provided interrater reliability (Tourangeau et al., 2005).

Analysis of Data

A one way analysis of variance (ANOVA) was used to analyze research question 1. An ANOVA was also used to analyze the second research question. SPSS for windows (Version 16.0) was utilized for all calculations and an alpha level of .05 was set for all tests. Post hoc comparisons were done for the results that were found to be significantly different.

Research Questions

1. Is there a statistically significant difference in the longitudinal reading achievement of students from Kindergarten through the Fifth Grade based on the type of preschool education they experienced?
2. Is there a statistically significant difference in the cohort reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on the type of preschool education they experienced?

Research Hypotheses

H_1 There is a statistically significant difference in the reading achievement of students from Kindergarten through the Fifth Grade based on the type of preschool education they experienced.

H_2 There are statistically significant differences in the reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on the type of preschool education they experienced.

Missing Data

A standard scheme for missing values is used for all variables in ECLS-K data. Unit nonresponses, legitimate skips, and item nonresponses are indicated by codes. Value

and description of missing value codes are identified in Table 6. NCES offers several suggestions for handling missing data in addition to the codes for missing values. These suggestions are as follows: "Users cross-tabulate all lead questions and follow-up questions before proceeding with any recodes or use of data." The SPSS statistical program was deemed appropriate for analyzing data (Tourangeau et al., 2005). The researcher will deal with missing data by deleting them.

Table 6

Variable Table: Variables Used in Study

Variable Name	Variable Description	Value Labels	Scale
CHILDID	CHILD IDENTIFICATION NUMBER	None	
GENDER	CHILD COMPOSITE GENDER	1="MALE" 2="FEMALE"	1-2
RACE	CHILD COMPOSITE RACE	1="WHITE, NON-HISPANIC" 2="BLACK OR AFRICAN AMERICAN, NON-HISPANIC" 3="HISPANIC, RACE SPECIFIED" 4="HISPANIC, RACE NOT SPECIFIED" 5="ASIAN" 6="NATIVE HAWAIIAN, OTHER PACIFIC ISLANDER" 7="AMERICAN INDIAN OR ALASKA NATIVE" 8="MORE THAN ONE RACE, NON HISPANIC"	1-8
R6AGE	R6 COMPOSITE CHILD ASSESSMENT AGE (MNTHS)	1="110 TO LESS THAN 126" 2="126 TO LESS THAN 132" 3="132 TO LESS THAN 138" 4="138 TO LESS THAN 144" 5="144 TO 166"	1-5
C56CW0	C5C6 CHILD PANEL WEIGHT FULL SAMPLE	None	
C2RRTSCO C4RRTSCO C5R2RTSC	C2 REC READING T-SCORE C4 REC READING T-SCORE C5 RC2 READING T-SCORE	1="KINDERGARTEN" 2="FIRST GRADE" 3="THIRD GRADE"	

Table 6 (continued)

C6R3RTSC	C6 RC3 READING T-SCORE	4="FIFTH GRADE"	
W5SESQ5	W5 CATEGORICAL SES MEASURE	1="FIRST QUINTILE" 2="SECOND QUINTILE" 3="THIRD QUINTILE" 4="FOURTH QUINTILE" 5="FIFTH QUINTILE"	1-5
P1PRIMPK	P1 PRIMARY TYPE NONPARENTAL CARE PRE-K	0="NO NON-PARENTAL CARE" 1="RELATIVE CARE, CHILD'S HOME" 2="RELATIVE CARE, OTHER'S HOME" 3="NON-REL CARE, CHILD'S HOME" 4="NON-REL CARE, OTHER HOME" 5="HEAD START PROGRAM" 6="CENTER-BASED PROGRAM" 7="2 OR MORE PROGRAMS" 8="LOCATION VARIES"	0-8
T6GLVL	T6 GRADE LEVEL OF CHILD	0="KINDERGARTEN" 1="FIRST GRADE" 2="SECOND GRADE" 3="THIRD GRADE" 4="FOURTH GRADE" 5="FIFTH GRADE" 6="SIXTH GRADE" 7="SEVENTH GRADE" 8="EIGHTH GRADE" 9="UNGRADED CLASSROOM"	0-9
S6SCTYP	S6 SCHOOL TYPE FROM THE SCH ADMIN QUEST	1="CATHOLIC" 2="OTHER RELIGIOUS" 3="OTHER PRIVATE" 4="PUBLIC"	1-4
S6ENRLS	S6 TOTAL SCHOOL ENROLLMENT	1="0-149" 2="150-299" 3="300-499" 4="500-749" 5="750 AND ABOVE"	1-5
S6PUPRI	S6 PUBLIC OR PRIVATE SCHOOL	1="PUBLIC" 2="PRIVATE"	1-2

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K).
(National Center for Educational Statistics, 2002)

CHAPTER IV

RESULTS

Introduction

The participants in this study were chosen from the National Center for Education Statistics (NCES) Early Childhood Longitudinal Study-Kindergarten Class of 1998-1999 (ECLS-K) Kindergarten, First, Third, and Fifth Grade Public-Use Data Files. This subsample contains 2,597 students in the four individual grade cohorts and 271 students in the longitudinal group, followed from kindergarten through fifth grade, who have taken the cognitive reading tests.

This chapter contains three sections: 1) Descriptive, 2) Statistical, and 3) Ancillary Findings. The Descriptive section gives descriptive statistics for all variables used in the study. The Statistical section shares the results of the statistical test for each hypothesis. The Ancillary Findings section consists of interesting facts that were not researched initially, but rather discovered upon analysis.

Description of ECLS-K Subsample

This section supplies the description of the subsample used for this study. Explanation of the descriptive means and standard deviations provided in this section is given as well. The subsample for this study was formed from the NCES ECLS-K Kindergarten, First, Third, and Fifth Grade Public-Use Data Files and Electronic Codebook, 2006 (NCES, 2006). This subsample contains 2,597 students in the four individual grade cohorts and 271 students in the longitudinal group, followed from kindergarten through fifth grade, who have taken the cognitive reading tests. The subsample used for the present study is comprised of kindergarten, first, third, and fifth

grade students of eight different races as reported in Table 7. The gender of these students is both male and female as reported in Table 8. These students participated in both part-day and full-day kindergarten programs and come from both public and private schools. They also come from various family types, socioeconomic, and language backgrounds. The children were provided pre-school education by relative care at home, non-relative care at home, a Head Start Program, a center-based program, or two or more different programs. The children also live in various regions of the United States.

Table 9 indicates the means and standard deviations of the variables used in this study. All descriptive statistics are presented in Tables 7 and 8 with the exception of the effect coded variables. Table 9 reports the means and standard deviations for the kindergarten variable C2RRTSCO (Reading T-Score), the first grade variable C4RRTSCO (Reading T-Score), the third grade variable C5RRTSCO (Reading T-Score), the fifth grade variable C6RRTSCO (Reading T-Score) and the longitudinal group variable (Reading T-Score). These five groups being analyzed provide large sample sizes, however, the number of participants decrease with each group due to students moving to different schools or dropping out of the study and not being tracked. The kindergarten and first grade group were compiled together and have a sample size of 17,201 participants, the third grade group has a sample size of 15,305, the fifth grade group has a sample size of 11,820, and the longitudinal group provided a sample size of 2,716.

Table 7

Demographics for Race

Grade Level	*White*	*Black*	*Hispanic, Race Specified*	*Hispanic, Race Not Specified*	*Asian*	*Native Hawaiian*	*Native Am. Indian*	*Multi-race*
Kindergarten and First Grade	9766 (56.7%)	2441 (14.2%)	1388 (8.1%)	1560 (9.1%)	1093 (6.4%)	196 (1.1%)	309 (1.8%)	412 (2.4%)
Third Grade	8664 (48.9%)	1996 (11.3%)	1363 (7.7%)	1408 (8%)	995 (5.6%)	181 (1%)	276 (1.6%)	401 (2.3%)
Fifth Grade	6733 (38.5%)	1342 (7.7%)	1095 (6.3%)	1153 (6.6%)	818 (4.7%)	153 (0.9%)	227 (1.3%)	282 (1.6%)
Longitudinal Group	1700 (62.6%)	330 (12.2%)	181 (6.7%)	157 (5.8%)	127 (4.7%)	55 (2%)	74 (2.7%)	92 (3.4%)

Table 8

Demographics for Gender

Gender	*Kindergarten and First Grade*	*Third Grade*	*Fifth Grade*	*Longitudinal Group*
Males	8791 (51.1%)	7807 (44.1%)	5987 (34.2%)	1324 (48.7%)
Females	8410 (48.9%)	7498 (42.3%)	5833 (33.3%)	1392 (51.3%)

Table 9

Means and Standard Deviations of Variables Used in the Study

Grade Level	Variable	Mean	Standard Deviation	Participants
P1PRIMPK	P1 PRIMARY TYPE NONPARENTAL CARE PRE-K			
Kindergarten				
	2="RELATIVE CARE"	45.4	16.3	4667 (32.65%)
	3="NON-REL CARE"	50.79	11.5	1495 (10.46%)
	5="HEAD START PROGRAM"	42.76	14.77	1302 (9.1%)
	6="CENTER-BASED PROGRAM"	52.26	11.76	6289 (43.99%)
	7="2 OR MORE PROGRAMS"	49.13	13.07	543 (3.8%)
First Grade				
	2="RELATIVE CARE"	47.78	13.3	4539 (32.6%)
	3="NON-REL CARE"	51.78	9.7	1467 (10.54%)
	5="HEAD START PROGRAM"	44.61	12	1275 (9.16%)
	6="CENTER-BASED PROGRAM"	52.61	9.69	6113 (43.9%)
	7="2 OR MORE PROGRAMS"	49.98	9.8	530 (3.81%)

Table 9 (continued).

Third Grade				
	2="RELATIVE CARE"	48.96	9.73	3848 (32.67%)
	3="NON-REL CARE"	53.49	8.91	1269 (10.76%)
	5="HEAD START PROGRAM"	44.98	9.46	995 (8.45%)
	6="CENTER-BASED PROGRAM"	53.42	8.92	5231 (44.42%)
	7="2 OR MORE PROGRAMS"	50.27	9.22	434 (3.69%)
Fifth Grade				
	2="RELATIVE CARE"	49.35	9.41	3081 (32.87%)
	3="NON-REL CARE"	53.73	8.96	1001 (10.68%)
	5="HEAD START PROGRAM"	44.89	9.36	813 (8.67%)
	6="CENTER-BASED PROGRAM"	53.72	9.07	4132 (44.09%)
	7="2 OR MORE PROGRAMS"	51.35	9.33	345 (3.68%)
Longitudinal Group				
	2="RELATIVE CARE"	50.80	9.56	796 (31.43%)
	3="NON-REL CARE"	54.26	8.77	255 (10.07%)
	5="HEAD START PROGRAM"	46.12	6.34	174 (6.87%)
	6="CENTER-BASED PROGRAM"	54.62	8.93	1221 (48.20%)
	7="2 OR MORE PROGRAMS"	51.71	8.95	87 (3.43%)

The lowest and highest means and standard deviations for each variable can also be compared in Table 9. A low mean of 42.76 (SD = 14.77) for the participants who received pre-school education by a Head Start Program and a high mean of 52.26 (SD = 11.76) for the participants who received pre-school education by a center-based program are reported for the kindergarten variable. A low mean of 44.61 (SD = 12) for Head Start and a high mean of 52.61 (SD = 9.69) for center-based programs represent the low and high means for the first grade variable. The third grade variable yielded a low mean of 44.98 (SD = 9.46) for Head Start and a high mean of 53.49 (SD = 8.91) for non-relative care in the home. For the fifth grade variable, a low mean of 44.89 (SD = 9.36) for Head Start and a high mean of 53.73 (SD = 8.96) was yielded for non-relative care. The longitudinal group variable yielded a low mean of 46.12 (SD = 6.34) for Head Start and a high mean of 54.62 (SD = 8.93) for center-based programs. A scale is provided for the reader through the mean and standard deviation chart. It provides a foundation of the data presented in this study. It also indicates the statistical significance of scores and results.

Research Analyses

This section restates the hypotheses tested for the present study and presents the procedures used to test them. The results of the statistical procedures are shared in this section. Tables 7, 8, and 9 are presented and explained in this section. It also displays research analyses with a detailed explanation of the results.

In order to answer our research questions, it was necessary to collapse some categories to make them more understandable. The variable, P1 Primary Type Non-parental Care Pre-K, created by NCES was recoded. In that variable, the -9 and -8 were recoded as system missing. Relative care at home was recoded as 2 while 3 and 4 were

recoded as 3, non-relative care at home. Head Start Program was recoded as 5 and center-based programs were recoded as 6. The two or more programs category was recoded as 7.

H_1: There is a statistically significant difference in the reading achievement of students from Kindergarten through the Fifth Grade based on the type of preschool education they experienced.

In order to test Hypothesis 1, an ANOVA was conducted to assess the difference in the reading achievement of students from Kindergarten through Fifth Grade based on the type of preschool education they experienced. The independent variable, the type of preschool education factor, included five levels: (1) relative care at home, (2) non-relative care at home, (3) a Head Start Program, (4) a center-based program, or (5) two or more different programs. The dependent variable was the longitudinal reading achievement. The ANOVA was significant, $F(4, 2528) = 46.42$, $p<.001$. The strength of the relationship between the type of preschool education and the longitudinal reading achievement, as assessed by η^2 was .07, with the level of type of preschool education factor accounting for 7% of the variance of the longitudinal reading achievement.

Tukey follow-up tests were conducted to evaluate pairwise differences among the means since the Levene's test for equality showed that equal variances could be assumed $F(4, 2528) = .97$, $p = .43$. The means and standard deviations for the five groups are: (1) an average reading T-score of 54.62 (SD = 8.93) for the 1221 participants in the center based group, (2) an average reading T-score of 54.26 (SD = 8.77) for the 255 participants in the non-relative care group, (3) an average reading T-score of 51.71 (SD = 8.95) for the 87 participants in the two or more programs group, (4) an average reading T-score of

50.80 (SD = 9.56) for the 796 participants in relative care, and (5) an average reading T-score of 46.12 (SD = 6.34) for the 174 participants in the Head Start group.

There were significant differences between all groups except: (1) relative care and two or more programs, (2) non-relative care and center-based, and (3) non-relative care and two or more programs. Center-based programs had the highest mean and standard deviation of all five categories with Non-relative care following close behind. The Head Start program had the lowest mean and standard deviation of all five groups. The effect of preschool experience, therefore, was significant, $F(4, 2528) = 46.42$, $p<.001$, supporting Hypothesis 1. For further explanation, please see Table 9.

H_2: There are statistically significant differences in the reading achievement of students in Kindergarten, First Grade, Third Grade, and Fifth Grade based on the type of preschool education they experienced.

In order to test Hypothesis 2, an ANOVA was conducted to assess the reading achievement of students from each grade cohort based on the type of preschool education they experienced. The independent variable, the type of preschool education factor, included five levels: (1) relative care at home, (2) non-relative care at home, (3) a Head Start Program, (4) a center-based program, or (5) two or more different programs. The dependent variable was the reading achievement of each cohort.

In the kindergarten cohort, the ANOVA was significant $F(4, 14291) = 90.6$, $p<.001$. The strength of the relationship between the type of preschool education and the reading achievement of the cohort, as assessed by η^2 was .06, with the level of type of preschool education factor accounting for 6% of the variance of the kindergarten reading achievement. Dunnett's C follow-up tests were conducted to evaluate the pairwise

differences among the means since the Levene's test for equality showed that unequal variances could be assumed $F(4, 14291) = 90.6$, $p<.001$. The means and standard deviations for the five groups are: (1) an average reading T-score of 52.26 (SD = 11.76) for the 6289 participants in the center-based group, (2) an average reading T-score of 50.79 (SD = 11.5) for the 1495 participants in the non-relative care group, (3) an average reading T-score of 49.13 (SD = 13.07) for the 543 participants in the two or more programs group, (4) an average reading T-score of 45.4 (SD = 16.3) for the 4667 participants in the relative care group, and (5) an average reading T-score of 42.76 (SD = 14.77) for the 1302 participants in the Head Start group. The Dunnett C follow-up test indicated that all groups are significantly different except non-relative care and two or more programs. The effect of preschool experience, therefore, was moderately significant, $F(4, 14291) = 243.6$, $p<.001$, supporting Hypothesis 2. For further explanation, please see Table 9.

In the first grade cohort, the ANOVA was significant $F(4, 13919) = 51.72$, $p<.001$. The strength of the relationship between the type of preschool education and the reading achievement of each cohort, as assessed by η^2 was .06, with the level of type of preschool education factor accounting for 6% of the variance of the kindergarten reading achievement. Dunnett's C follow-up tests were conducted to evaluate the pairwise differences among the means since the Levene's test for equality showed that unequal variances could be assumed $F(4, 14291)$ -90.6, $p<.001$. The means and standard deviations for the five groups are: (1) an average reading T-score of 52.26 (SD = 11.76) for the 6289 participants in the center-based group, (2) an average reading T-score of 50.79 (SD = 11.5) for the 1495 participants in the non-relative care group, (3) an average

reading T-score of 49.13 (SD = 13.07) for the 543 participants in the two or more programs group, (4) an average reading T-score of 45.4 (SD = 16.3) for the 4667 participants in the relative care group, and (5) an average reading T-score of 42.76 (SD = 14.77) for the 1302 participants in the Head Start group. The Dunnett C follow-up test indicated that all groups are significantly different from each other. The effect of preschool experience, therefore, was moderately significant, $F(4, 14291) = 243.6$, $p<.001$, supporting Hypothesis 2. For further explanation, please see Table 9.

In the third grade cohort, the ANOVA was significant $F(4, 11772) = 6.35$, $p<.001$. The strength of the relationship between the type of preschool education and the reading achievement of the cohort, as assessed by η^2 was .08, with the level of type of preschool education factor accounting for 8% of the variance of the kindergarten reading achievement. Dunnett's C follow-up tests were conducted to evaluate the pairwise differences among the means since the Levene's test for equality showed that unequal variances could be assumed $F(4, 11772) – 6.35$, $p<.001$. The means and standard deviations for the five groups are: (1) an average reading T-score of 53.49 (SD = 8.91) for the 1269 participants in the non-relative care group, (2) an average reading T-score of 53.42 (SD = 8.92) for the 5231 participants in the center-based group, (3) an average reading T-score of 50.27 (SD = 9.22) for the 434 participants in the two or more programs group, (4) an average reading T-score of 48.96 (SD = 9.73) for the 3848 participants in the relative care group, and (5) an average reading T-score of 44.98 (SD = 9.46) for the 995 participants in the Head Start group. The Dunnett C follow-up test indicated that all groups are significantly different except center-based care and non-relative care. The effect of preschool experience, therefore, was moderately significant,

$F(4, 11772) = 6.35$, $p<.001$, supporting Hypothesis 2. For further explanation, please see Table 9.

In the fifth grade cohort, the ANOVA was significant $F(4, 9367) = .89$, $p = .47$. The strength of the relationship between the type of preschool education and the reading achievement of the cohort, as assessed by η^2 was .09, with the level of type of preschool education factor accounting for 9% of the variance of the kindergarten reading achievement. Tukey follow-up tests were conducted to evaluate the pairwise differences among the means since the Levene's test for equality showed that equal variances could be assumed $F(4, 9367) = .89$, $p = .47$. The means and standard deviations for the five groups are: (1) an average reading T-score of 53.73 (SD = 8.96) for the 1001 participants in the non-relative care group, (2) an average reading T-score of 53.72 (SD = 9.07) for the 4132 participants in the center-based group, (3) an average reading T-score of 51.35 (SD = 9.33) for the 345 participants in the two or more programs group, (4) an average reading T-score of 49.35 (SD = 9.41) for the 3081 participants in the relative care group, and (5) an average reading T-score of 44.89 (SD = 9.36) for the 813 participants in the Head Start group. The Tukey follow-up test indicated that all groups are significantly different except relative care is not different from two or more programs, non-relative care is not different from center-based care, and non-relative care is not different from two or more programs. The effect of preschool experience, therefore, was moderately significant, $F(4, 9367) = .89$, $p = .47$, supporting Hypothesis 2. For further explanation, please see Table 9.

In each of the five categories of preschool experiences reported, the Head Start Program received the lowest means in each of the five groups (kindergarten, first, third,

fifth, and longitudinal), indicating that they consistently had the lowest reading T-scores of the five preschool categories studied.

The center-based program and non-relative care consistently received the highest means or the highest average reading T-scores of the five preschool categories studied. The center-based category was found to deliver the highest average reading T-scores in the kindergarten, first, and longitudinal groups while the non-relative care reportedly had the highest average reading T-scores in the fifth and third grade groups.

The demographics for gender are reported in Table 8. The number of males and females in each grade remained remarkably balanced. The number of males was higher in grades kindergarten, first, third, and fifth grade by a few percentage points, with the percentage of females being slightly higher in the longitudinal group. The demographics for race are reported in Table 7 and offered a good representation of the populations in the United States with the "white" race ranking the highest in each category and the "black" race ranking the second highest in each category.

Chapter IV presented the description of this study. The research analyses were presented in this study. The results of the statistical tests for each hypothesis were presented for the participants of the 1998 ECLS-K Longitudinal Study Kindergarten. The influence of preschool experience was presented in this chapter. Chapter five will offer policy, practice, and implication of these results.

CHAPTER V

DISCUSSION

This study investigated whether there is a statistically significant difference in the longitudinal reading achievement of students from kindergarten through the fifth grade based on the type of preschool education they experienced. It also tested whether there is a statistically significant difference in the cohort reading achievement of students in kindergarten, first grade, third grade, and fifth grade based on the type of preschool education they experienced.

The ECLS-K Public Use and Data File was used to conduct the analysis for this study. Erikson (1950) contributed to the theoretical framework of this study. Erikson contended that, in a person's early years, he or she develops patterns that regulate or influence their actions and interactions for the rest of his or her life. He believed that although basic trust and independence are formed early in individuals' lives and affect later actions and attributes, people can also choose to work toward a better resolution of any one of these developmental tasks at any point throughout their lives. In today's society, there are increasing numbers of young children spending time daily in child care centers or in family child care. It is important to remember that changing social conditions do not change young children's developmental needs. Therefore, as Mooney (2006) notes, educators must work to create places with atmospheres in which young children's needs are met, and they and their families can thrive.

Conclusions and Discussion

In order to test Hypothesis 1, an ANOVA was conducted to determine if there is a statistically significant relationship among students from Kindergarten through Fifth

Grade based on the type of preschool education they experienced: (1) relative care at home, (2) non-relative care at home, (3) a Head Start Program, (4) a center-based program, or (5) two or more different programs. The ANOVA was significant.

Tukey follow-up tests were conducted to evaluate pairwise differences among the means since the Levene's test for equality showed that equal variances could be assumed. There were significant differences between all groups except: (1) relative care and two or more programs, (2) non-relative care and center-based, and (3) non-relative care and two or more programs. Center-based programs had the highest mean of all five categories with Non-relative care following close behind. Two or more programs had the next highest mean with Relative care following close behind. However, the Head Start program had the lowest mean and standard deviation of all five groups. The effect of preschool experience, therefore, was significant, supporting Hypothesis 1.

In order to test Hypothesis 2, an ANOVA was conducted to assess the reading achievement of students from each grade cohort based on the type of preschool education they experienced. The independent variable was the type of preschool education each person experienced: (1) relative care at home, (2) non-relative care at home, (3) a Head Start Program, (4) a center-based program, and (5) two or more different programs. The dependent variable was the reading achievement of each cohort.

In each of the cohorts (kindergarten, first, third, fifth, and longitudinal), the ANOVAs were significant, supporting Hypothesis 2. Dunnett's C follow-up tests were conducted for the kindergarten, first, and third grade cohorts to evaluate the pairwise differences among the means since the Levene's test for equality showed that unequal variances could be assumed.

In the kindergarten cohort, the Dunnett C follow-up test indicated that all groups are significantly different except non-relative care and two or more programs. While these two programs were not significantly different, they were among the three highest means of the five groups, with center-based programs scoring the highest, non-relative care being the second highest, and two or more programs being the third highest. These three groups could possibly produce the highest means due to the children being introduced to new individuals and new environments. In most center-based programs, it is common practice to have a preschool curriculum and to change out the educational materials on a regular basis. This could contribute to the children being more curious and mentally stimulated, thus, enhancing their learning opportunities and exploration. The non-relative care and two or more programs also provide a different learning environment with different individuals than they experience in their home environment, which could also contribute to their means not being significantly different.

Many early childhood theorists (Locke, Rousseau, Pestalozzi, Froebel, Dewey, Montessori, Piaget, and Vygotsky) have noted the importance of socialization and new sensory experiences in the education of young children. Pestalozzi emphasized the importance of the home environment in educating children, and over time, also developed an appreciation and understanding of the essential nature the school environment played in a child's education (Anderson, 1974). Dewey (1916) and Vygotsky (1978) both placed emphasis on the importance of children being socially active in the classroom environment. Dewey (1916) believed that true learning occurs through real-life experiences and described education as a process for living. He stressed social responsibility and the idea that children should be equipped through education to

effectively function in society (Gargiulo & Kilgo, 2005). Vygotsky also believed that social experiences were very important since they are needed for higher order cognitive processes, such as language and cognition. Therefore, development and learning occur as a result of engagement and social interaction (Gargiulo & Kilgo, 2005).

In the first grade cohort, the Dunnett C follow-up test indicated that all groups are significantly different from each other. Center-based care produced the highest mean with non-relative care having the second highest mean. Two or more programs had the third highest mean and relative care came in fourth. As in the kindergarten cohort, the Head Start program once again had the lowest mean for reading achievement. The center-based program's high mean is most likely a result of the stimulating curriculum, high quality learning environment, and interaction with the other children.

In the third grade cohort, the Dunnett C follow-up test indicated that all groups are significantly different except center-based care and non-relative care. While center-based care produced the highest means of reading achievement, non-relative care came in a very close second. This could possibly be a result of non-relative care environments often having a fewer amount of children, making it possible to provide more one-on-one time with each child. The center-based program's high means are as mentioned earlier most likely a result of the stimulating curriculum, high quality learning environment, and interaction with the other children.

In the fifth grade cohort, the ANOVA was significant. Tukey follow-up tests were conducted to evaluate the pairwise differences among the means since the Levene's test for equality showed that equal variances could be assumed. The Tukey follow-up test indicated that all groups are significantly different except relative care is not different

from two or more programs, non-relative care is not different from center-based care, and non-relative care is not different from two or more programs.

In all five of the cohorts studied, non-relative care and center-based programs have the highest means in each of the five groups (kindergarten, first, third, fifth, and longitudinal), with non-relative care being the highest in the third and fifth grade categories and center-based programs being the highest in the kindergarten, first, and longitudinal categories. As mentioned earlier, this could possibly be a result of non-relative care environments providing more one-on-one time with each child and the center-based programs providing stimulating curriculum, learning environment, and interaction with the other children.

In each of the five categories of preschool experiences reported, the Head Start Program received the lowest means, indicating that they consistently had the lowest reading T-scores of the five preschool categories studied. These results support the study findings of Levitt and Fryer (2004) and Levitt and Dubner (2005) which indicated that participation in Head Start had no lasting effects on its participants' test scores in the elementary years of school. These research findings could also possibly support the results of studies by Munoz (2001) and the Administrative History of the Office of Economic Opportunity (2004) which reported that children who finish the Head Start program and are placed into disadvantaged schools perform even worse than their peers by the time they reach second grade. They believe that the only way these children will improve is by being dispersed and sent to better-performing schools. However, Magnuson, Ruhm, and Waldfogel (2004) discovered that children attending schools with lower academic instruction and disadvantaged children had the largest and most lasting

academic gains from early education. This indicates the great need for high quality early childhood care among disadvantaged children.

The center-based program and non-relative care consistently received the highest means or the highest average reading T-scores of the five preschool categories studied. The center-based category was found to deliver the highest average reading T-scores in the kindergarten, first, and longitudinal groups while the non-relative care reportedly had the highest average reading T-scores in the fifth and third grade groups.

Center-based Program

These findings supported the research of Sevigny (1987) who compared children that attended preschool and those who did not attend preschool. Through research, Sevigny discovered that the preschool group achieved at a higher level and even outperformed the other group on standardized reading tests in grades 3-11. Other research by Bergan and Feld (1992) also determined that children's math, reading, and science abilities and social skills increased from their initial assessment to the progress assessment. These findings also supported Ramey and Ramey's (2004) research study which found that children who attended a high-quality preschool program experienced improved performance in reading and mathematics in elementary and secondary school.

However, these study results did not support a 2008 study by Howes, Burchinal, Pianta, Bryant, Early, Clifford, and Barbarin which determined that the gains in social skills and school-related learning were not related to the child or program, but rather to closer child-teacher relationships and higher-quality instruction. These study findings also contradicted the 1991 study by Bowlin and Clawson which found that children who

attended preschool did not score significantly higher on the comprehensive test of basic skills in reading and mathematics.

Non-relative Care

The results of this study indicated that non-relative care had the highest average reading T-scores in the third and fifth grade groups. These are interesting results since much of the past research concerning non-relative care and maternal employment have reported no connection or negative associations (Desai, Chase-Lansdale, & Michael, 1989; Baum, 2003; Farel, 1980) with student achievement. However, studies such as Baum's (2003), which included indicators of demographics as control variables yielded results that were supported by these study findings. Baum (2003) reported that maternal income served to increase financial security and lessen the negative effects on cognitive outcomes of children with working mothers. These study results also supported the research findings of Vandell and Ramanan (1992) who found maternal employment, when financially necessary in low-income families, to have contributed positive effects on children's reading and math scores.

When evaluating these study findings, it is interesting to review the various studies concerning the age of the child in relation to non-relative care or maternal employment. For instance, this study reported that students in non-relative care had the highest average reading T-scores in the third and fifth grade groups. These results supported the study findings of Blau and Grossberg (1992) which indicated that maternal employment related positively to children's achievement. A 1992 study by Vandell and Ramanan also reported positive effects of maternal employment in low-income families on children's reading and math scores. The age of the students in this study (third and

fifth grade) could have impacted the outcome of this study. For example, a mother working when her child is young has been associated with negative outcomes (Baum, 2003; Baydar & Brooks-Gunn, 1991; Farel, 1980; Ruhm, 2004), however, there have been other studies which report that maternal employment relates positively to children's achievement (Blau & Grossberg, 1992).

The males and females in each grade remained remarkably balanced. Males were higher in grades kindergarten, first, third, and fifth by a few percentage points, with the percentage of females being slightly higher in the longitudinal group. The demographics for race offered a good representation of the populations in the United States with the White race ranking the highest in each category and the Black race ranking the second highest in each category.

Limitations

1. The study examined specific variables from ECLS-K: 98 defining reading T-score, relative care at home, non-relative care at home, a Head Start Program, a center-based program, or two or more different programs. If different ECLS-K:98 variables had been selected, the results of the study could be different.
2. The data used in the study were collected by NCES, therefore, the researcher is limited to the data made available through the ECLS-K:98 database.
3. The study is limited to NCES definitions of Reading T-Score, relative care at home, non-relative care at home, a Head Start Program, a center-based program, and two or more different programs.

Recommendations for Policy and Practice

The purpose of this study was to determine which early childhood preschool experiences contributed to reading achievement in students, kindergarten through fifth grade. This comparison provides additional information to policymakers, educational leaders, and other stakeholders, such as, parents, caregivers, and teachers, who would benefit from knowing which early childhood education experiences produced the greatest academic gains in students. Based upon the ECLS-K:98 data sample, research from this study indicated that preschool educational experiences predicted the reading achievement of students in grades kindergarten through fifth grade; thus, analysis of the data provides additional information for reviewing program outcomes.

Recommendations for policy and best practices that can possibly develop from this study include but are not limited to the following.

Policymakers

Policymakers should pass laws that improve early childhood education programs, such as Head Start, which provide a better start for poverty level children. Magnuson and Waldfogel (2005) examined the effects of early childhood education on racial and ethnic gaps in preparing young children to enter school. As a result of their studies, they discovered that Caucasian children who attend preschool programs or care entered school more ready to learn. After a closer look, Magnuson and Waldfogel (2005) also found that the types of preschool programs the children attended differed in that African-American and Hispanic children are more likely to attend Head Start than Caucasian children. Due to these and other similar findings, the researcher believes it is necessary to take a closer look at Head Start programs in order to find areas where improvements are needed.

Policymakers should pass laws that provide funding to improve the schools that poverty level children enter upon leaving Head Start. The Administrative History of the Office of Economic Opportunity (2004) reported that children who attend Head Start are often placed into disadvantaged schools and often perform worse than their peers by the time they reach second grade. Other studies (Lee & Loeb, 1995; Munoz, 2001) reported similar findings. Due to these findings, the researcher believes that in order for these children to improve, it is important for the policymakers to not only improve Head Start programs, but to also improve the schools these children are attending after leaving.

Teacher Education Programs

Teacher education programs must examine the most successful early educational experiences and implement those practices to improve programs such as Head Start. The results of this study consistently indicated both longitudinally and in each grade cohort that children who attend center-based and non-relative care score higher in reading achievement. With these results, the researcher believes it is important to examine these types of care in order to determine what these programs have that Head Start programs may be lacking.

Early Childhood Professionals, Administrators, and K-12 Public School Teachers

Early childhood professionals, administrators, and K-12 public school teachers should work together to develop more effective parent education programs to empower, support, and educate parents on how to help their children succeed in school. These programs need to include practices such as, "how to read a book to your child at home", "how to verbally communicate with your child to foster higher order thinking skills", etc. Because parents play such an important role in the education of their children, the

researcher believes it is important for individuals who come in contact with parents to find ways to educate parents on how to help their children. This researcher has seen many teachers, administrators, and early childhood professionals fail to take the opportunities provided to build relationships and educate parents. After all, no matter what a professional's opinion of a parent is, that parent still knows their child better than anyone else and has the power to influence their child's life.

Administrators, teacher educators, and teachers should write to obtain grant funding, which would serve as incentive payment for parent involvement in poverty level schools. This would allow more parents to be able to occasionally miss work to be involved in a school activity with their child.

Administrators, teacher educators, and teachers should present staff development on how teachers can improve their relationships with parents and foster parent participation. There have been numerous studies (Bornstein & Tamis-LeMonda, 1989; Estrada, Arsenio, Hess, & Holloway, 1987; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Morrison & Cooney, 2002; Burchinal, Peisner-Feinberg, Pianta & Howes, 2002; Duncan & Brooks-Gun, 1997; NICHD ECCRN, 2000; Pianta & Harbers, 1996; Sameroff, Seifer, Baldwin, & Baldwin, 1993; Bradley, Corwyn, Burchinal, Pipes, McAdoo, & Garcia Coil, 2001; NICHD ECCRN & Duncan, 2003) on the impact of the family and home environment on the academic achievement of children. All of which note the important influence that parents, family, and the home environment have on the academic achievement of children. Due to these findings, the researcher recognizes the importance and necessity of teachers learning how to build and foster positive relationships with parents and families.

The next section offers recommendations for Future Research.

Recommendations for Future Research

The next study about preschool experience and reading achievement should ask the following questions.

1. What percentage of the children studied after leaving Head Start attend poverty level or disadvantaged schools?
2. What characteristics of kindergarten through fifth grade classrooms contribute to children being successful readers?
3. What aspects of preschool curriculum or educational activities contribute to the reading achievement of students in kindergarten through fifth grade?
4. Is there a statistically significant difference in the reading achievement of children who attend centers accredited by the National Association for the Education of Young Children (NAEYC) and the children who attend centers not accredited by NAEYC?
5. Is there a statistically significant difference in the reading achievement of children who attend Head Start accredited by NAEYC and children who attend Head Starts not accredited by NAEYC?
6. Is there a statistically significant difference in the reading achievement of students from Kindergarten through the Fifth Grade based on their socioeconomic status (SES)?
7. Is there a statistically significant difference in the reading achievement of students from Kindergarten through the Fifth Grade based on the experiences of their home environment?

This researcher selected the above questions as a beginning of future research because it is important to understand the situation as a whole. While Head Start may need some improvements, we must also seriously consider the impact of the poverty level or disadvantaged schools these children are attending upon leaving Head Start programs. Perhaps it should be considered that some government funding could be of better service if it were focused on supporting these children once they have entered our public school system. After all, what is the purpose of spending billions of dollars to help preschool children if we are not going to support them once they advance beyond preschool? We must examine the kindergarten through fifth grade classrooms which have successfully and consistently prepared children to be successful readers in order to determine what characteristics the disadvantaged classrooms lack. In the past, the NAEYC accreditation has been considered the highest accreditation among early childhood scholars. It is important to determine if this accreditation really impacts these classrooms. If so, the question must be asked: Why not expect all government funded Head Start centers to obtain this accreditation? Future research listed above would be of interest to all stakeholders, including parents, caregivers, preschool teachers, administrators, teacher education programs, and policy makers.

In closing, this study not only provides one of the largest sample sizes for this age group in relation to reading achievement, but it also provides insight as to what early childhood backgrounds or experiences lead to successful reading achievement. The results also present critical information needed to direct future research and learning and provide guidelines for improvement of services for preschool students in the education system. The numerous preschool students the researcher has served over the years and the

increased emphasis being placed on reading achievement in No Child Left Behind triggered the interest for this study. Based on this knowledge, the findings in this study could serve as an additional source of information to aid teachers, administrators, and policy makers in the decision-making process. These findings could also serve as the potential for students becoming successful readers that impact preschool programs, reading instruction, and the future of our education system.

APPENDIX

INSTITUTIONAL REVIEW BOARD APPROVAL

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
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HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **28111803**
PROJECT TITLE: **Impact of Preschool Education on Reading Achievement of Kindergarten Through Fifth Grade Students**
PROPOSED PROJECT DATES: **11/15/08 to 03/30/09**
PROJECT TYPE: **Dissertation or Thesis**
PRINCIPAL INVESTIGATORS: **Melissa H. Clark**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Curriculum, Instruction, & Special Education**
FUNDING AGENCY: **N/A**
HSPRC COMMITTEE ACTION: **Exempt Approval**
PERIOD OF APPROVAL: **12/02/08 to 12/01/09**

Lawrence A. Hosman
Lawrence A. Hosman, Ph.D.
HSPRC Chair

12-08-08
Date

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