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May 2013

IMPACT OF PRE-KINDERGARTEN EDUCATION ON ELEMENTARY  
STUDENT ACHIEVEMENT: IMPLICATIONS FOR SCHOOL LEADERS

A Doctoral Thesis Presented to the  
Faculty of the College of Education  
University of Houston

In Partial Fulfillment of the  
Requirements for the Degree

Doctor of Education  
in Professional Leadership

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May 2013

## **DEDICATION**

For Peyton Justice Pierson:

God has given me no greater gift than you as my son. You have been a blessing since the day you were born. I love you to the moon and back!

## **ACKNOWLEDGEMENTS**

First and foremost, I would like to thank God for putting this opportunity in front of me and giving me the wisdom, strength, and patience to complete this journey.

To my husband David, I offer my sincerest gratitude for making the sacrifices that you did so that I could go to class and make this dream a reality. Thank you for sticking with me through this crazy process. I love you.

Mom and Dad, thank you for your continued financial support, for without it, this dream would have been just that – a dream. Dad, you have always wanted me to get my doctorate, so I guess now you will have to admit that I am smarter than you (or at least as smart). You always said I needed to do it while you were still here to pay for it, and I guess we succeeded. Although, I am still not sure how we roped mom for half. Mom, you have always been my biggest fan and greatest cheerleader. There was never a time that I called and you weren't there. I was truly blessed with the best parents ever.

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## **ABSTRACT**

The purpose of this study was to determine if pre-kindergarten attendance resulted in increased school readiness for kindergarten students; and if prekindergarten attendance resulted in higher student achievement for third grade students. Specifically, the data for this research was drawn from the pre-kindergarten program of a mid-size district in Houston, Texas. In terms of methodology, quantitative techniques and analysis were used to illustrate data collected from the research sample. A two-sided t-test was run on each group to model the relationship between pre-kindergarten attendance and school readiness as determined by TPRI and social screening; and, the relationship between pre-kindergarten attendance and academic success as measured by third grade TAKS. Furthermore, a multiple linear regression test was performed on each group to assess if gender and ethnicity further impacted the results of school readiness and academic success.

The findings of this research showed that attending pre-kindergarten impacted school readiness in two areas and showed no impact in one area of the TPRI. The areas that showed a positive correlation were beginning letter sound identification and listening comprehension. The area that revealed no impact was blending onset rhymes and phonemes. Another notable finding is that students who had attended pre-kindergarten showed no significant edge in socialization as identified by the University of Texas Social Screener Survey. As for longer term success, pre-kindergarten attendance did not have a significant impact on third grade TAKS scores in neither reading nor math.



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## **CHAPTER ONE**

### **INTRODUCTION**

Overwhelming concerns related to children's readiness for school are not novice by any means; yet, the recent number of task force, commissions, panels, legislative initiatives, and corporate involvement signify unprecedented attention to children's competencies upon school entry. Of particular concern is the school preparation of children from economically disadvantaged families. Even with the benefits of early intervention, studies have found that children from families with low socioeconomic status begin school, on average, with significantly poorer academic skills than more advantaged children (Stipek & Ryan, 1997). The preschool years provide the foundation that children bring to school as kindergarteners. This critical experience with formal education is the first step in a journey through the elementary and secondary schools. Unfortunately, too many children experience difficulties during this progression: below-average achievement, grade retention, behavior difficulties in the school environment and, eventually, a lack of commitment to education so that far too many leave school prior to graduation. Concern with these problems has, subsequently, led to legislative reform.

The No Child Left Behind (NCLB) legislation has governed schools and school districts since 2001. This single form of legislation has become one of the most significant federal reforms since the passage of the Elementary and Secondary Education Act (ESEA) in 1965. The purpose of No Child Left Behind is to (a) increase accountability for student performance, (b) focus on what works based on scientific

research, (c) empower parents and expand parental involvement, and (d) increase local control and flexibility (NCLB, 2001).

The primary focus of No Child Left Behind is to hold schools accountable for the performance of students who are struggling to learn. Schools and school districts are accountable for providing a fair, equal, and significant opportunity to obtain a high quality education for all students, and are expected to meet proficiency standards on state academic achievement standards and assessments for all students. The NCLB legislation requires that, by 2014, all students will be proficient in reading and math. To measure progress of schools and to ensure that equal opportunity is given to all students, data is reported by multiple categories where all schools must meet the proficiency standard in all of the categories. Data is reported by student groups including but not limited to:

- All Students
- African-American
- Hispanic
- White
- Limited English Proficient
- Economically Disadvantaged
- Special Education

Reporting data in this manner is intended to force schools to provide fair and equal educational opportunities to all students, as well as to close achievement gaps that have historically existed across the subgroups. An additional requirement of NCLB is that students who do not meet the minimum standard on the fifth grade reading and/or math tests, are not to be promoted to the sixth grade (NCLB, 2001).

Although NCLB has made some positive impact in reducing gaps across racial and socio-economic groups, it has not addressed other identified hindrances to school readiness. With the increased demand for accountability and improved student performance on a national level, the issues of school readiness and early literacy have taken on increased importance (Weigel, Martin, & Bennett, 2006). And, even though school readiness is a sensitive topic among early childhood educators and policy makers across the country, at present, there is no agreed upon definition of “school readiness”. Nonetheless, most educational professionals agree that readiness includes at least five domains – namely, (1) health and physical development, (2) emotional well-being and social competence, (3) approaches to learning, (4) communication skills, and (5) cognition and general knowledge (“NEGP: What’s New,” n.d.).

More and more, children are entering kindergarten with one or more risk factors for school failure. In other words, they have physical, mental, emotional, social, or academic deficits that hinder their ability to meet the rigorous curriculum expectations. In addition, children with these risk factors are more likely to have had limited exposure to literacy that impedes their language and vocabulary development. This particular development is a critical piece of reading readiness; thus, these students enter kindergarten already at a disadvantage. In lieu of escalating academic demands in kindergarten, moreover, the lack of school readiness means that children are already a year behind and will likely struggle throughout their elementary years. Poor school readiness increases the likelihood of grade level retention, low academic achievement, special education placement, and, ultimately, school dropout (Ramey et al., 2000).

## **Statement of the Problem**

State and local budget cuts have affected all levels of education, including early childhood – an area that has been studied for more than twenty-five years (Barnett & Frede, 2010). The United States faces serious educational issues, such as high rates of school failure, dropout, crime and delinquency, as well as far too many youth who are not well prepared for the workforce, which could actually be assuaged through effective early education. Thirty-five to forty-five percent of American children are poorly prepared to succeed in school upon their entry into kindergarten (Barnett & Frede, 2010).

Most preschool programs available in public schools are only open to students who meet certain criteria. For instance, in order to be eligible for enrollment in a pre-kindergarten class in Texas, a child must be at least three years of age and:

- is unable to speak and comprehend the English language; or
- is economically disadvantaged; or
- is homeless, as defined by 42 U.S.C. Section 1143a, regardless of the residence of the child, of either parent of the child, or of the child's guardian or other person having lawful control of the child; or
- is the child of an active duty member of the armed forces of the United States, including the state military forces or a reserve component of the armed forces, who is ordered to active duty by proper authority; or
- is the child of a member of the armed forces of the United States, including the state military forces or a reserve component of the armed forces, who was injured or killed while serving on active duty; or



- is (or ever has been) in the conservatorship of the Department of Family and Protective Services following an adversary hearing held as provided by Section 262.201, Family Code.

Eligibility for free pre-kindergarten programs is limited by statute (TEA, 2011a). Also, one of the main reasons why most public preschool programs have been limited to children from low-income families is that much of the education policy in the United States focuses on closing the achievement gap between disadvantaged students and their higher income peers (Barnett, 2008). In spite of multiple reform movements to close the achievement gap between disadvantaged and non-disadvantaged students, moreover, a gap still exists between the groups' performance. According to the 2011 Texas Academic Excellence Indicator System (AEIS), children in the economically disadvantaged subgroup have lower test scores than their non-disadvantaged peers in all subject areas (TEA, 2011b).

According to a study by the National Institute for Early Education Research, Texas has the largest pre-kindergarten program in the United States (Legislative Budget Board, 2007). Furthermore, as of 2007, there were 182, 293 students enrolled in pre-kindergarten programs across the state at a cost of \$497.7 million.

There are an abundant amount of funds being spent on pre-kindergarten programs in Texas; yet, there is conflicting research on whether or not attendance in a pre-kindergarten program, in fact, results in lasting, long-term academic success (Marcon, 2002). Beginning in the early 1980s, leading early childhood experts expressed concern about the wisdom of overly instructive, formal practices for young children (Marcon, 2002). In particular, these experts feared that short-term academic gains would be offset

by a long-term stifling of children's motivation and self-initiated learning. Later research suggests that these early concerns were warranted. Research has shown that later school success declined when the intervention was discontinued (Barnett, 1995). However, additional research has produced strong evidence that the preschool years are critical in developing children's cognitive, emotional, social, and physical development. Preschool attendance leads to improved cognitive ability, and, ultimately, improves children's academic achievement in school (Denton, 2001).

Children from disadvantaged backgrounds enter school with lower levels of background knowledge and experiences critical for school success. Thus, disadvantaged children do not advance academically at the same rate as their non-disadvantaged peers, widening the achievement gap. Nevertheless, additional research is needed in order to determine whether or not pre-kindergarten programs for economically disadvantaged students provide the pre-reading, language acquisition, and vocabulary skills necessary to close the achievement gap between disadvantage students and their non-disadvantaged peers on the third grade state test. In lieu of the conflicting evidence, it is imperative to address the following question: "What are the academic effects of pre-kindergarten enrollment on school readiness and future academic performance?"

### **Purpose of the Study**

Given the current budget cuts and added pressure of high-stakes testing, a renewed interest has been placed on whether or not pre-kindergarten programs in public schools are beneficial to students' future academic success. The results of Texas Assessment of Knowledge and Skills (TAKS) tests and End of Course (EOC) exams are used to determine student promotion, assignment to intervention programs, and whether

or not a student graduates. Stricter requirements and higher standards have led educators to take a closer look at the importance of early intervention for all students designated at risk of failure in schools (Mitchell, 2001).

The purpose of this study was to determine if pre-kindergarten attendance resulted in increased school readiness for kindergarten students; and if pre-kindergarten attendance resulted in higher student achievement for third grade students. Specifically, the data for this research was drawn from the pre-kindergarten program of a mid-size district in Houston, Texas.

### **Theoretical Framework**

Ideally, pre-kindergarten is one part of a comprehensive early childhood policy agenda that aims to ensure that all children come to school ready to succeed despite their home situation, background knowledge, or real-world experiences (Mitchell, 2001). Enrollment in pre-kindergarten exposes students to experiences that – in the most ideal circumstances – should lead to improved social, emotional, and cognitive abilities, with subsequent academic achievement.

In Texas, pre-kindergarten programs service three- and four-year-olds who are considered at risk (i.e., are categorized as low income, homeless, or limited English speaking). Further, state funding provides for a half-day program, and some districts pool additional funds to service students in a full-day program. Despite the fact that 225,037 Texas children participate in state funded pre-kindergarten programs (TEA, 2011b), there continues to be an achievement gap on state test performance between disadvantaged children and their non-disadvantaged peers (TEA, 2011b).

## **Research Questions**

This study was guided by the following research questions:

**Research Question One:** Is there a significant difference in the third grade 2010-2011 TAKS reading scores between eligible students who participated in public pre-kindergarten programs compared to those eligible students who did not participate in pre-kindergarten programs in the study district?

**Research Question Two:** Is there a significant difference in the third grade 2010-2011 TAKS math scores between eligible students who participated in public pre-kindergarten programs compared to those eligible students who did not participate in pre-kindergarten programs in the study district?

**Research Question Three:** Is there a significant difference in kindergarten readiness scores as measured by beginning of the year TPRI scores and The University of Texas Social Screener between eligible students who participated in public pre-kindergarten programs and those eligible students who did not participate in pre-kindergarten programs in the study district?

## **Research Hypothesis**

**Research Hypotheses One:** There is a significant difference in the achievement level in reading of students in third grade, who attended pre-kindergarten programs in the study district, and those eligible for pre-kindergarten programs but did not attend, as measured by the third grade reading TAKS.

**Research Hypotheses Two:** There is a significant difference in the achievement level in math of students in third grade, who attended pre-kindergarten programs in the

study district and those eligible for pre-kindergarten programs but did not attend, as measured by the third grade math TAKS.

**Research Hypotheses Three:** There is a significant difference at the beginning of the kindergarten year in school readiness skills, as measured by the TPRI and The University of Texas Social Screener, between students who attended pre-kindergarten programs in the study district, and those who were eligible for pre-kindergarten programs, but did not attend.

### **Definition of Terms**

Results of this study are to be reviewed in context of the following definitions provided for clarity:

**Academic Excellence Indicator System (AEIS):** The AEIS report is a report released by the Texas Education Agency in the fall of each school year. It contains information submitted by school districts through the Texas Public Education Information Management Systems (PEIMS) during the previous year. The information contained in the AEIS report relevant to this study are the achievement scores of students on the Texas Assessment of Knowledge and Skills by grade level, subject, socio-economic status, gender, and ethnicity.

**At-Risk:** A student is considered “at-risk” of dropping out of school based on state defined criteria (TEC, n.d.).

**Even Start Program:** This program is a literacy initiative focused on supporting non-English-speaking families. The program provides high-quality, intensive, and age-appropriate early childhood education services. In addition, this initiative provides

intensive instructional programs in adult literacy – including English language literacy that leads to economic self-sufficiency.

**Head Start Program:** The Head Start program is a federally-funded government education initiative that has provided children from low-income families with free access to early education programs since 1965.

**Pre-kindergarten Student:** A student who participates in a public school district's pre-kindergarten program. In Texas, these students must meet certain criteria to be eligible. The criteria is that students must be eligible for federal free or reduced lunch prices based on an income survey and are four years old by September 1<sup>st</sup>. Students are also eligible if they are determined to be Limited English Proficient based on a home language survey and results of a language proficiency assessment.

**Public Education Information Management System (PEIMS):** PEIMS is a statewide data management system for public education information in the state of Texas. A wide variety of demographic and descriptive data, such as district organization, finance, staff, and student demographics, can be accessed from this database.

**Socio-Economic Status (SES):** This term identifies the current level of income to determine a student's eligibility for free, reduced or full price meals under the national school lunch and child nutrition program or other public assistance. This status is determined by providing income documentation.

**Student Success Initiative (SSI):** This term denotes grade advancement requirements that apply to the Texas Assessment of Knowledge and Skills (TAKS) reading and mathematics tests at grades 5 and 8. As specified by these requirements, a student may advance to the next grade level only by passing these tests or by unanimous decision of

his or her grade placement committee that the student is likely to perform at grade level after additional instruction. The goal of the SSI is to ensure that all students receive the instruction and support necessary to be academically successful in reading and mathematics. This effort depends greatly on joint efforts of schools, parents, and community members working in partnership to meet individual student needs.

**Texas Assessment of Knowledge and Skills (TAKS):** This term refers to the criterion-referenced test administered to students in grade 3-11 in the areas of reading, language arts, math, writing, science, and social studies. The TAKS information used in this study is third grade reading and math scores.

**Texas Primary Reading Inventory (TPRI):** This particular instrument is an early reading assessment designed to identify the reading development of students in kindergarten through third grade. This particular measurement tool is a diagnostic instrument that administered one-on-one, which assists teachers in providing targeted instruction. Ultimately, the TPRI is utilized in order to assist students in improving overall reading and literacy proficiency.

**Title I:** This program provides financial assistance to the local education agency and schools with high numbers or high percentage of poor children to help ensure that all children meet challenging state academic standards. The school district in this study receives Title I funds, therefore, all schools in this district are eligible to receive Title I funds.

### **Limitations**

The findings of this study are limited by the following:

1. The population is made up of students in only one school district.

2. There are actually two different studies within this research. The student groups are from two different samples of students. The sample of students who will be used for the TAKS correlation are currently in fourth grade in the selected district. The sample of students who will be used for the TPRI correlation are currently first graders in the selected district.
3. Students who qualified for pre-kindergarten solely on the criteria of having a language other than English as their first language were omitted from the study.
4. TPRI is administered by teachers and is, therefore, subject to possible bias.
5. The TPRI data is also manually entered by classroom teachers and is, therefore, subject to data entry error.

### **Summary**

The last several decades have seen a growing interest in public investments in children at early ages. A primary source of said interest is growing knowledge and awareness of the importance of environmental influences on development (Barnett, 2005). However, many questions still exist regarding the long-term impact of pre-kindergarten programs. The goal of pre-kindergarten is not only to prepare children for kindergarten; but to ensure the gains they make are sustainable throughout their elementary school years. This study was also limited to examining the academic effects of pre-kindergarten enrollment at the kindergarten and the third grade level.



## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

#### **Introduction**

The system of early education in the United States has recently experienced tremendous growth. This particular trend has enabled most children to gain access to some sort of early education program. These programs also operate under a wide range of sponsorships, from private organizations and public schools, to Head Start programs, a federal government education initiative that has provided children from low-income families with free access to early education programs (Barnett & Hustedt, 2003).

Pre-kindergarten programs serve as a gateway to closing the gap that currently exists between economically disadvantaged children and their non-disadvantaged peers. Educators are realizing that, by the time some children reach kindergarten, they are already behind their peers in school readiness skills. As children advance through their elementary school years, the gap tends to widen, and eventually becomes more and more pervasive and difficult to close in the long-term. This particular phenomenon has captured the awareness and attention of state leaders, and these influential individuals are forwarding the call that quality pre-kindergarten programs must be funded so that early literacy intervention can put disadvantaged children on an equal playing field (Legislative Budget Board, 2007).

Scientific research has produced strong evidence that the preschool years are critical in determining children's capacity for healthy social, emotional, cognitive, and physical development. Although some disadvantaged students are successful without pre-kindergarten, a great number of those who do not participate in a high-quality pre-

kindergarten program trail their peers in terms of academics (Espinosa, 2002). Part of the reason for the gap is grounded in parental value on early literacy skills, as evidenced by parents limited use of literacy skills and absence of books in the home (Wasik & Bond, 2006).

Other research conducted suggests that preschool education can also produce substantial gains in children's learning and development; nevertheless, researchers disagree about whether such gains are permanent (Barnett, 2002). Most research on early education has focused on the effects on the IQ scores of economically disadvantaged children and has found few preschool programs that have produced lasting IQ score gains. Further, even the more effective programs tend to show positive results in the short-rather than long-term (Barnett & Hustedt, 2003). However, studies also reveal that pre-school education produces persistent gains on achievement test scores, along with fewer occurrences of grade retention and placement in special education programs (Barnett, 1995).

Recent research has demonstrated that preschool is a sound investment – academically, socially, and economically. Three particular studies, which examined the High/Scope Perry Preschool Program, the Abecedarian Early Childhood program, and the Title I Chicago Child-Parent Centers, provide comprehensive evidence that academic and other benefits from preschool education can yield economic benefits that far outweigh the costs of intensive, high-quality preschool programs (Barnett, 1996; Reynolds, Robertson, & Mann, 2002). These studies identified several long-term economic benefits of early education, finding that former preschool participants were less likely to cost taxpayers money in the long term for public services, such as:

- Schooling- Participants were less likely to be retained in a grade or be placed in special education.
- Welfare- As adults, participants were more likely to get better jobs and earn more money.
- The criminal justice system- Participants were less likely to break laws or participate in other delinquent acts.

These positive effects have far reaching benefits. For example, although pre-school education research has largely focused on the benefits for children in poverty, several studies indicate that high-quality effective early education programs improve the learning and development of all children. These findings also raise the question of determining what a quality preschool program is. Many preschool programs in the United States offer services that are poor or of mediocre quality (Barnett, 2008).

However, there is no single, agreed-upon definition of quality for preschool programs in general. That being said, the National Institute for Early Education Research (NIEER) has developed 10 benchmarks for state standards relating to program quality. The ten benchmark standards are as follows: (1) comprehensive early learning standards, (2) a teacher with a Bachelor of Arts degree, (3) specialized training in pre-kindergarten, (4) an assistant teacher with a child development associate credential, (5) at least 15 hours per year of in-service for teachers, (6) a maximum class size below 20, (7) a staff-child ratio of 1:10 (or better), (8) vision, hearing, and health support services, (9) at least one meal, and (10) site visits (“National Institute for Early Education Research (nieer.org),” n.d.). According to the National Institute for Early Education Research’s 2010 State of Preschool Report, Texas has only met four out of the above ten benchmark

standards for preschool education. Providing quality pre-kindergarten services is an important strategy for increasing children's ability to meet the increasingly rigorous kindergarten standards, as well as meeting the accountability requirements that all schools are facing at the federal, state and local level.

### **History of Pre-kindergarten Programs**

Early childhood education in the United States has been influenced by seminal thinkers from various European nations. In 1837, for instance, Friedrich Froebel established a new type of early childhood school – specifically, a child's garden for three and four year olds. Prior to this period, children under the age of seven were not permitted to attend school (Jeynes, 2007).

The notion of early education was introduced in the United States, in Boston, in 1828. In particular, the Boston Infant School is recognized as the country's first daycare center for children between the ages of eighteen months and four years of age. It was established to enable mothers to work, as well as to provide an appropriate setting for children while the mothers were at the workplace. The Boston Infant School was also modeled after the infant schools in Scotland, which was developed by Robert Owens, a Welsh educator. Infant schools were tailored specifically for children of working mothers, and focused on the implementation of literacy activities and pupils' overall moral development (Saracho & Spodek, 2003).

Additionally, the Montessori program was another innovative educational program offered to children during the time of the nursery school movement. Montessori schools in the United States, which are based on the works of Dr. Montessori, and began in the early 1920s, are still in existence today. Montessori schools emphasize sensory

education and identify periods in the development of children when the children are most receptive to learning (Saracho & Spodek, 2003).

The nursery school movement continued until federal involvement in school readiness and early childhood education provided new programs for early intervention. During the 1940s, federally funded childcare centers were established in response to the needs of working mothers during World War II. These centers remained operational until after the war as a means to provide jobs for the large number of unemployed teachers, nurses and social workers (Edwards, 1999).

Later, during the 1960s, pre-kindergarten programs for disadvantaged children were provided through the *Economic Opportunity Act (EOA) of 1964* and through a designation called “Title I” – a component of the *Elementary and Secondary Education Act of 1965 (ESEA)* (Edwards, 1999). The purpose of this legislation was to provide preschool programs to meet the needs of educationally deprived children. The target of these early education programs was to give children from poverty an equal opportunity for school readiness (Edwards, 1999), and to bridge the gap between poverty and prosperity in order to provide all individuals with equal opportunities for education (Mitchell, 2001).

Pre-kindergarten programs were initially provided for the intent of supplementing the foundation established by the family. As families and societies changed, however, early education transformed into an essential component in the fight for educational equality for all. In 1986, the passage of Public School Law 99-457 – a mandate for free and appropriate public education for preschool children – led to those who were three-to-five years of age with disabilities the right to attend a pre-kindergarten program.

Ultimately, this led to an increase in the number of students attending pre-kindergarten programs (Landry, 2005).

Then, in 1991, in response to growing interest in early education, the United States National Institute of Child Health and Human Services formed a team of researchers to design and implement a study of child care. The study addressed the relationship between child care arrangements and experiences, and children's developmental outcomes. The study measured a number of specific variables, including and limited to parenting practices, maternal vocabulary, children's social development, and language mastery (Landry, 2005). Data from this study reflected that the amount of time spent in daycare had no relationship to language or cognitive development. The study did show, however, that the overall quality of the childcare predicted children's language and cognitive development (i.e., increase quality led to increase language and cognitive development). Quality was determined by sensitive caregiving and frequency of language stimulation.

Before 1960, there were only three states with pre-kindergarten programs – namely, Wisconsin, New Jersey, and Pennsylvania. First, Wisconsin allowed public schools to enroll four-year olds in kindergarten and claimed state aid. Then, New Jersey followed suit in 1903. In 1949, Pennsylvania permitted school districts to maintain kindergarten for children aged four-to-six years of age; yet, it did not provide any state funding (Mitchell, 2001). Between 1960 and 1970, four states created programs – specifically, Hawaii, California, New York, and Connecticut. Each appropriated state money to expand Head Start. Moreover, this budgetary trend continued into the 1990s until all but nine states had appropriated state funds for pre-kindergarten education.

### **Pre-kindergarten in Texas**

Pre-kindergarten in Texas was established by the 68<sup>th</sup> Legislature in 1984 for the purpose of developing in children the skills necessary for success in the regular curriculum, including language, math and social skills (Legislative Budget Board, 2007). Pre-kindergarten programs in Texas serve three- and four-year-olds who are considered at-risk (e.g. low income, homeless, and/or of limited English speaking proficiency). In 2001, the 77<sup>th</sup> Texas Legislature amended the Texas Education Code (TEC) to permit ineligible children to participate in pre-kindergarten program provided the parents pay tuition. Once again, during the 79<sup>th</sup> Texas Legislature, with the passage of House Bill 1, eligibility was extended to allow for children of active duty members of the armed forces of the United States, and children of members of the armed forces who were injured or killed (Legislative Budget Board, 2007). Then, in 2007, eligibility was extended again to include children in foster care.

School districts in Texas must offer a pre-kindergarten program if at least fifteen eligible four-year-old children are identified. In addition, three-year-old children can be served through the pre-kindergarten program as well. The Texas Education Agency (TEA) reports that, during the 2011-2012 academic year, there were 225,037 students enrolled in Texas pre-schools – an overall increase of approximately 10,000 more students than were enrolled the previous year (TEA, 2011a). Moreover, according to the National Institute for Early Education Research (NIEER), Texas has the largest pre-kindergarten program in the United States in terms of the number of children served (National Institute for Early Education Research [nieer.org], n.d.).

Texas funds half-day pre-kindergarten programs through the Foundation School Program (FSP). FSP funding is calculated and distributed on the basis of district level average daily attendance (ADA) aggregates (Legislative Budget Board, 2007). The Texas Education Agency estimates that \$409 million in 2005-2006 FSP funding can be attributed to pre-kindergarten ADA. In addition, state funding is available through the pre-kindergarten Expansion Grant Program. School districts may apply to TEA for grants to expand existing half-day pre-kindergarten programs at campuses that had not previously operated such programs (Legislative Budget Board, 2007).

Out of 1,033 school districts and 194 charter schools operating in the state, a total of 980 school districts offer either full-day or half-day pre-kindergarten programs (Legislative Budget Board, 2007). In a statewide survey of quality standards, the NIEER provided Texas's pre-kindergarten program standards a rating of only 4 out of 10 due to the fact that there is no minimum class size, no limit on the staff-child ratio, and no requirement for teachers to meet the NIEER benchmark of Child Development Associate credential or equivalent degree. Although vision and hearing screening and referral were required, there was no health screening requirement in Texas. School districts were not required to provide meals to pre-kindergarten program attendees, and the state did not require site visits to monitor the programs. However, districts were encouraged not to exceed the 22:1 child-staff ratio required for kindergarten through fifth grade. Furthermore, teachers in Texas public schools must obtain a Bachelor's degree and a teacher generalist certification for Early Childhood through Sixth Grade (also referred to as "EC-6") (Barnett, Hustedt, Robin, & Hawkinson, 2006).



In addition, Texas has adopted comprehensive pre-kindergarten curriculum guidelines which provide skills and concepts that 3-and 4- year-old children should know in each subject area delineated in the kindergarten Texas Essential Knowledge and Skills. The pre-kindergarten guidelines meet NIEER's benchmark for comprehensive early learning standards (Barnett et al., 2006). Texas is making achievement gains and elevating student performance for students classified as low socioeconomic compared with students of similar backgrounds in other states (Grissmer & Flanagan, 1998). Perhaps this is because of the large percentage of children attending pre-kindergarten programs.

### **Federal Pre-kindergarten Head Start**

The federal Head Start program began in 1965, and is by far the largest and best-known preschool program in the nation. By the 2000-2001 academic year, Head Start had served more than 20 million at-risk children (Denton, 2001). And, when Head Start began, little was known about identifying and measuring variables in child development. As a result, there have been no significant scientific evaluations of results of the program. The only real attempt at a national evaluation of Head Start's effectiveness during its first three decades came in 1969, when the program was still in its infancy. Despite the finding suggesting that Head Start participants performed better in the first and second grade than did those children who had not participated in such programs, a study concluded that Head Start was not beneficial overall – partly because benefits could not be documented in the third grade (Love & Society for Research on Educational Effectiveness [SREE], 2010).

There have also been many other smaller-scale studies of the effectiveness of individual Head Start Programs. Yet, at best, these studies provide snapshots of Head Start at particular places and time. More than that, these studies present a mixed picture in terms of research. For instance, approximately equal number of studies found either a positive impact or no impact on children's performance in school, and an even smaller number showed negative effects from Head Start (Denton, 2001).

Recent studies using new sources of data have resulted in more positive conclusions about Head Start's effectiveness. A 1995 study based on data from the Bureau of Labor Statistics' *National Longitudinal Survey of Youth* found that Head Start participants had significantly higher test scores and school performance – not only than those of children with no preschool experience, but also than those of children in other preschool programs. For white children, these benefits were long lasting; yet, for African American children, they diminished over time (Denton, 2001).

The discovery that Head Start's early benefits gradually disappear – particularly for minority children – has probably been the most consistent finding in the research, and it has persisted throughout the program's history. The apparent fade-out of benefits associated with the program has been a central focal point for critics, who argue that the benefits of Head Start are not worth the costs. There is growing evidence, however, that this phenomenon has less to do with the Head Start program than with children's experiences in school (Hull, 2011).

According to a report by the U.S Department of Health and Human Services, disadvantaged children lag behind throughout the school years. Children with multiple risk factors suffer the greatest educational disadvantages (U.S. Department of Health and

Human Services, 2003). Furthermore, achievement differences in school are greatest for children who suffer the greatest disadvantage – in particular, those children whose families have multiple risk factors and/or receive welfare. A key set of risk factors has been repeatedly associated with educational outcomes, such as low achievement test scores, grade repetition, suspension or expulsion, and dropping out of high school. These risk factors include: (a) having parents who have not graduated high school; (b) coming from a low-income or welfare-dependent family; (c) living in a single-parent family; and, (d) having parents who speak a language other than English at home. Children who have one or more of these risk factors are more likely to be educationally disadvantaged or have difficulty in school (U.S. Department of Health and Human Services, 2003).

Head Start is aimed at families living in poverty. In addition, most children who attend Head Start are minorities. During the 1999-2000 academic year, two-thirds of all Head Start participants were African-American, Hispanic, or American Indian. Historically, poor and minority communities have received the nation's lowest quality schools. For these children to succeed in the long run, they need schools that assess them regularly to detect new or recurring problems. They need high-quality classrooms that constantly reinforce their positive experiences in Head Start. Sadly, though, the children targeted by Head Start are the least likely to attend that kind of school (Zhai, Brooks-Gunn, Waldfogel, & Society for Research on Educational Effectiveness [SREE], 2010).

An evaluation of the Head Start Comprehensive Child Development Program randomly assigned 4,410 children and families living in poverty at 21 sites to the program, or no program, and tracked them for five years (Goodson, Layzer, St. Pierre, Bernstein, & Lopez, 2000). The program focused on the comprehensive services offered

to families and the assignment of each family to a case manager to help meet their needs. The study found no significant effects on either child or parent outcomes; thus, raising the question of whether families who use early childhood programs actually profit from case management.

However, according to Barnett (2002) during a congressional panel review of his research on the effectiveness of Head Start, it was argued that Head Start produced substantial long-term educational benefits. Specifically, that the program improved the lives of the families it served. In addition, Barnett deemed that the misunderstanding about Head Start resulted from the failure to consider the full range of outcomes provided by the program itself, as well as flawed research methods, which generated and led to faulty conclusions.

Despite Head Start's role in providing services for low income children and their families, a lack of resources prevents the program from reaching even more children. In 2005, the federal government funded 10,000 fewer Head Start slots than in 2004. Approximately half of the eligible children are enrolled in the pre-school program, and just 2.5 percent of eligible children are enrolled in Early Head Start (Hamm, 2006). As Congress continues to think about reauthorizing the Head Start program, access to the program and the value of high quality comprehensive services provided to low-income families should be the primary consideration.

As history demonstrates, pre-kindergarten programs were created in waves, driven by different forces over time, and all related in some way to early learning and school success. During the 1960s and 1970s, the primary motivation was giving poor kids a "Head Start". Later, in the 1980s, education reform served as the driving force

along with published research reports of positive results from longitudinal studies of preschool interventions. In the 1990s, states were influenced by the National Education Goals and school readiness concerns.

### **Significance of Pre-kindergarten Programs**

The speed with which globalization and technological innovations have transformed economic, political, and social relationships over the past decade requires a new approach to investments related to early childhood programs. The number of children in the United States attending pre-kindergarten has risen dramatically in recent years. As a result, there has been an increase in research conducted in the area of early education and its subsequent benefits (Magnuson, Ruhm, & Waldfogel, 2007).

The research of Levine (2005) emphasizes and supports the need for high quality early learning opportunities for young children. More specifically, Levine refers to the fact that the areas of health, cognition, and emotion are strongly developed in the early years. Therefore, according to his research perspective, interrupting or hindering this development could result in problems in the future. There is evidence to suggest that early learning opportunities also improve the functioning of the family unit and, consequently, reap long-term benefits for society as a whole (Gormley, Gayer, Phillips, & Dawson, 2005).

The American Federation of Teachers (2003) supports the need for early childhood education as a means of ensuring that children are better prepared to handle formal schools. This particular organization cites the fact that high-quality programs provide children with secure and caring relationships with educators and caregivers, stimulating learning opportunities and experiences that prepare them for the later school

years. These programs are characterized by the following practices: (a) Language-rich and responsive communication between adults and children; (b) positive and appropriate reinforcement of skills and behavior; (c) extensive rehearsal of old and new cognitive, academic and developmental skills; (d) guidance in desirable social skills and facilitation of positive interactions between peers and adults; (e) various structured and informal activities that encourage children to reflect, predict, question and hypothesize; (f) availability of numerous materials, resources and toys that focus on language and literacy; (g) activities that encourage the involvement of children's families and caretakers; and, (h) incorporation of adequate nutrition and habits that will support good health.

After such rich and diverse experiences, children are better able to handle formal schooling. They succeed because they have language skills that are more developed, a better sense of group work and play with other children, and grounding in other basic academic and social skills. In addition, children with such experiences also have positive expectations about school (The American Federation of Teachers, 2003).

Children who have gone through these programs also have more secure relationships with adults; they are better equipped to follow directions; and, they are more likely to trust figures of authority and be able to communicate their needs openly and effectively. Young children are capable learners, and having these types of educational experiences during their preschool years makes it possible for them to learn at a faster rate, become better readers, and, consequently, be better overall students (The American Federation of Teachers, 2003).

Growing school readiness and early childhood interest has brought increased attention to identifying educational programs that are most effective for young children (Reynolds, 1992). There are some landmarks early childhood programs that have influenced present day philosophy on early childhood education, which are paramount in establishing the positive impact of early childhood education. The sections below will describe some of these programs in greater detail.

### **Landmark Preschool Programs**

The following programs represent examples of well-conceived programs. These programs each consisted of long-term follow-up studies that analyze the outcomes of the program: The Perry Preschool Project, which tracked participants up to age 41; the Abecedarian Early Childhood Intervention, which tracked participants up to age 21; The Prenatal/Early Infancy Program, which tracked participants up to age 15; The Chicago Child Parent Centers, which tracked participants up to age 22; and, Head Start, which tracked participants up until age 31. Additionally, the programs covered a broad range of possible ages for participants: The Perry Preschool Project (from ages three through five), the Abecedarian Early Childhood Intervention program (from early infancy to age eight), the Prenatal/Early Infancy Program (from pre-natal to two years old), The Chicago Child Parent Centers (from ages three to nine), and Head Start (from ages three through five). Finally, these programs took place in a wide variety of areas from rural (the Abecedarian Childhood Intervention); to small town (The Perry Preschool Program); to small city (The Pre-natal/Early Infancy Program); to large urban inner city (The Chicago Child Parent Centers). The sections that follow outlay more detailed descriptions of each of the programs chronologically by the beginning dates.

**The High/Scope Perry Preschool Project.** The High/Scope Perry Preschool Project took place in Ypsilanti, Michigan, and was in place from 1962-1967. The program randomly assigned 128 disadvantaged minority children to either a half-day preschool program with home visits by the teachers, or a control group that was not enrolled in a program. Children attended the preschool program for two years starting at age three. The services included daily 2.5 hour classes and 1.5 hour weekly home visits with the mother and child. In addition, annual evaluations of the children were performed until they reached age 11, and then again at ages 14, 15, 19, and 27. The Perry study followed 123 of the children well into their adult years of development. The researchers' ability to study nearly the entire group over time also reinforced their confidence in the overall long-term findings (S. Barnett, 2008). For example, according to Schweinhart (2003), by the age of 27, the participants of the program in comparison with the control group had:

- Higher rates of high school completion;
- A lower incidence of welfare assistance as adults;
- A lower incidence of out of wedlock births;
- A lower rate of repeated arrests; and
- A higher likelihood of earning \$2,000 or more per month.

**Project Head Start and Early Head Start.** Another program that largely impacted the provision of childcare for young children was the initiative of Project Head Start, which is a federal program that promotes the school readiness of children ages birth to 5 years of age from low-income families by enhancing their cognitive, social, and emotional development (Early Childhood Learning and Knowledge Center - Head Start,



n.d.). Head Start programs provide a learning environment that supports children's growth in the following: (a) language and literacy, (b) cognition and general knowledge, (c) physical development and health, (d) social and emotional development, and (e) approaches to learning. Head Start also emphasizes the role of the parents as their child's first and most important teacher. This program builds relationships with families that support family well-being and positive parent-child relationships, families as learners and lifelong educators, family connections to peers and community, and families as advocates and leaders (Zhai et al., 2010).

Many Head Start Programs also provide Early Head Start, which primarily serves infants, toddlers, pregnant women, and their families, who – in many instances – have incomes below the federal poverty level. Head Start programs also offer a variety of service models, depending on the needs of the local community. Programs may be based in centers or schools that children attend for part or full day services, family childcare homes or children's own homes (Early Childhood Learning and Knowledge Center - Head Start, n.d.).

Early Head Start serves over 600,000 children from birth to three years of age in some 700 programs statewide. By the age of three, children in Early Head Start programs performed significantly better than control groups on cognitive, language, and social emotional development indicators. Furthermore, their parents were:

- more emotionally supportive,
- used less punitive parenting approaches,
- provided more stimulating home environments,
- read more often to their children.

- were more likely to participate in education and job training, and
- were less likely to have another child during the years after enrollment in Early Head Start (Love & Society for Research on Educational Effectiveness [SREE], 2010).

**The Chicago Child-Parent Center Preschool Program.** The Chicago Child-Parent Center (CPC) Preschool Program was developed to promote academic success among low-income children, and to encourage parents to become more involved in their children's education. The CPC program also focuses on supporting low-income minority children in high-poverty neighborhoods. The program itself was established in 1967 through Title I funding. It represents the second-oldest federal preschool program after Head Start; and, it stands as the longest running extended early intervention (Mueller & Jennings, 1974).

Eligibility criteria for the program are that applicants (a) residence in a Title I attendance area, (b) demonstrate a high educational need due to poverty-associated factors, and (c) have parents that agree to participate (Reynolds, White, Temple, Robertson, & Ou, 2011). The program also includes the following three components: (a) the development of reading and language skills, (b) parental involvement, and (c) comprehensive services. This program offers half-day preschool for three- and four-year-olds, as well as full or part-day kindergarten for five-year-olds. Pupils' parents are required to be involved in the center at least one-half day per week. The overall program also provides a wide variety of comprehensive services, which include attending to children's nutritional and health needs, coordinated adult services, funds for professional

development and instructional supplies, and a focused emphasis on reading readiness through reduced class size, writing, and reading activities within the center.

According to Reynolds et al. (2011), by the age of 26 years, participants of this particular program exhibited:

- Significantly higher rates of high school completion (79.7% vs. 72.9%);
- Significantly lower rates of felony arrests (13.3% vs. 17.8%);
- More years of completed education;
- Higher rates of health insurance coverage (76.7% vs. 66.6%); and
- Lower rates of depression symptoms.

**Carolina Abecedarian Project.** The Carolina Abecedarian Project (CAP) was a longitudinal experimental study that was conducted between 1972-1977, which was designed to determine the extent to which intensive educational intervention, begun in early infancy, could prevent retardation and academic failure in children from disadvantaged backgrounds. Those specific families at-risk for having a child displaying developmental delays were identified from local prenatal clinics or social service agencies.

The purpose of this program was to determine the degree to which the course of children's cognitive development might be positively altered. The intervention was primarily child-focused, and delivered in a daycare setting (Campbell & Ramey, 1991). Ninety-eight percent of the sample was African-American. Participants were assigned to either a program group or a limited program control group. Children in both groups received social services and nutritional supplements. After completing the early

intervention phase, participants in both groups were randomly assigned to either the experimental preschool treatment group, or the preschool control group.

Children in the preschool experimental group attended the educational daycare program from early infancy until they entered public kindergarten at age five. A systematic curriculum was used and included learning activities in the cognitive, language, and social-emotions development. In this program, parents were encouraged to visit the nursery and preschool, and a variety of brief programs to provide information on parenting and other topics of interest were offered to them. Children in the program received at least two meals per day at the center, and received medical care from doctors and nurse practitioners at the center (Campbell, & Ramey, 1991).

The original sample was composed of 111 children. Fifty-seven infants from low-income families also received intensive, high-quality daycare from birth to three years of age. In their first year of program participation they received care at home through home visitations. Then, during their remaining two years, they received services in a preschool setting. Lastly, each child had an individualized prescription, which addressed their individual educational, social, and emotional developmental needs.

The comparison group consisted of 54 untreated children who were raised at home or in a different childcare setting. According to Campbell et al. (1991), the participants in the treated group had very positive results. For example, by their 21<sup>st</sup> birthday, the participants of the program had:

- More years of completed education,
- Higher rates of four-year college or university of enrollment,
- More skilled jobs,

- A modest increase in Full Scale and Verbal IQ and,
- A lower rate of teenaged parenthood.

**The Prenatal/Early Infancy Project.** From 1978-1982, the Prenatal/Early Infancy Program (PEIP) took place in Elmira, New York. This particular study consisted of four hundred first-time mothers who were enrolled in the program before their 30<sup>th</sup> week of pregnancy. The women enrolled in this program were overwhelmingly at high risk of having poor child and family outcomes. Additionally, to compound their situational challenges, 85% were under the age of 19 and/or unmarried and/or of low economic status. The women were randomly assigned to one of two intervention groups or one of two control groups. The women in the intense intervention group received on average of nine visits during pregnancy and 23 home visits. The main intervention was a home visiting program conducted by registered nurses, who provided parent education, social support, and referrals to social services. The program continued until children were two years old, and some of the benefits of the program were:

- Less visits to the hospital emergency room;
- Lower number of child abuse cases;
- Fewer months on welfare;
- Fewer months receiving food stamps;
- Lower number of mothers being arrested;
- Lower number of mothers being convicted;
- Lower number of subsequent pregnancies; and
- Longer time between first and second birth.

(Karoly et al., 1998)

As described above, early care and education programs have positive effects on young children's cognitive and social development, and these effects can be substantial. These studies showed not only immediate gains, but lasting benefits for learning and educational achievement, school progress and educational attainment, and social behavior (including delinquency and crime).

### **Impact of Pre-kindergarten Programs on Student Achievement**

Research has established that preschool education can produce substantial gains in children's learning and development (Barnett & Hustedt, 2003). Four-year olds who attend pre-kindergarten programs are more successful in kindergarten and beyond – both academically and socially (Nores & Barnett, 2010).

In his study of Oklahoma's universal pre-kindergarten program, Gormley (2005) shows that, upon entering kindergarten, students who went to pre-kindergarten showed an increase in letter-word identification, spelling scores, and in applied problem solving as measured on the Woodcock-Johnson Achievement test. The results provide solid support for the benefits that such a program can have on test scores of young children of differing ethnic groups and from different socioeconomic backgrounds. The program was found to have statistically significant effects on children's performance on cognitive tests of pre-reading and reading skills, prewriting and spelling skills, and math reasoning and problem solving abilities (Gormley et al., 2005).

In another study, Magnuson (2007) found that pre-kindergarten attendance boosts children's reading and math scores at school entry. The study further showed that academic outcomes are slightly larger for disadvantaged children. Nevertheless, according to Barnett (2008), prior research has found that advantages fade over time

(lasting only through 1<sup>st</sup> or 2<sup>nd</sup> grade) as other children become equal, and that 70-80% of the cognitive gains of pre-kindergarten predicted for the average child diminishes by the spring of first grade (Magnuson et al., 2007).

Also according to Barnett (2005), it is critically important that public school educators buy into the notion that educating today's children should begin prior to kindergarten. Although that is already happening in many places, the need for programs beyond the federally funded Head Start program, still exist in many states. In these difficult economic times, it is imperative that pre-kindergarten programs continue to be funded, and that the pre-kindergarten academic standards be treated with the same integrity that the K-12 standards are. As stated by James Heckman, who has studied preschool education in the context of global competitiveness, when it comes to investing in preschool education, "We can't afford not to" (Barnett, 2005).

In a report by Barnett and Frede (2010), high quality preschool is advocated for based on decades of research. High quality programs can be found in a variety of settings including, but not limited to public schools, private child care, and Head Start. High quality pre-kindergarten programs help facilitate children's social, emotional, moral, and physical development, as well as helps shape their attitudes, beliefs, dispositions, and habits.

Over the last fifty years, researchers have accumulated a large body of evidence regarding the effects of preschool education on children's learning and development. Researchers associated with the National Institute of Early Education Research at Rutgers University conducted a comprehensive meta-analysis of findings from 123 studies conducted since 1960. Most often studies investigate the effects of preschool education

on cognitive development. Studies also looked at how preschool affects the socio-emotional development and school success (Barnett & Frede, 2010). The findings of the research study are quite clear: Preschool education positively affects learning and development. The average effect of the programs studied on cognitive development is substantial, large enough to move a child from the 30<sup>th</sup> to the 50<sup>th</sup> percentile on standardized tests at kindergarten entry (Barnett & Frede, 2010). An in-depth look at long-term findings reveals that gains in achievement, and decreases in behavior problems, grade repetition, and special education are followed by other important outcomes throughout adulthood, such as increased high school graduation rates, increased earnings, decreased crime and delinquency and better mental health (Barnett & Frede, 2010).

In a report by Barnett (1995), the findings of thirty-six studies of both model demonstration projects and large-scale public programs were analyzed. It included studies of preschool education, Head Start, child care, and home visiting programs, and focused primarily on the effects of program participation on children's cognitive development. Results indicate that early childhood programs can produce large short-term benefits for children on intelligence quotient (IQ) and sizable long-term effects on school achievement, grade retention, placement in special education, and social adjustment (Barnett, 1995).

A study by Wong, Cook, Barnett, and Jung (2008) evaluated how five states' pre-kindergarten programs affected children's receptive vocabulary, math, and print awareness skills. Specifically, the states chosen were Michigan, New Jersey, Oklahoma, South Carolina, and West Virginia. These states were selected because, on average, they



have higher quality program standards than non-studied states. The study found that in receptive vocabulary only two states yielded significant standard impact, though the other three showed positive effects. In math, all states showed positive trends, but again only two of the states showed significant, reliable results. However, in print awareness all five states had significantly positive effects. In conclusion, the study showed that the evidence supports the perception that preschool programs can work to increase performance in the early school grades (Wong, Cook, Barnett, & Jung, 2008). Evidence also suggests that these programs can positively affect later high school graduation rates, labor force participation, stable household formation, and criminal behavior (Currie, 1995).

Further research conducted by Campbell and Ramey (1989) demonstrated that early educational intervention can significantly benefit children at high-risk for academic failure. It enhances intellectual growth and improves school performance. Taken together with results from other, similar experiments with disadvantaged children, the results suggest that intervention should begin in infancy and that children who appear to benefit most are those born to mothers with very low IQs (Campbell & Ramey, 1989).

In a study at The University of Florida, conducted by Rebecca Marcon, three different preschool methods were studied to determine whether children who began school at four years of age would have school success later. These children were from urban school districts and were studied at age four, again in year five as they prepared to leave primary grades, and in year six when they were preparing to leave fourth grade. The study examined report card grades, retention rates, and special education placement of 160 children at the end of their fifth year in school and 183 children at the end of their

sixth grade year. The sample was 96% African-American, with 75% of the children qualifying for subsidized school lunches. Academically, girls surpassed boys at the end of year five, and this difference persisted into the next grade level. Children whose preschool experience was more academically directed had been retained less often than peers. No differences attributable to preschool model were found for special education placement. And, by the end of their sixth year in school, children whose preschool experiences had been academically directed earned significantly lower grades compared to children who had attended child-initiated preschool classes. Children's later school success appears to have been enhanced by more active, child-initiated early learning experiences. Their progress may have been slowed by overly academic preschool experiences that introduced formalized learning experiences too early for most children's development status (Marcon, 2002).

According to Duncan, Ludwig and Magnuson (2007), reading and math skills at kindergarten entry are highly predictive of later school achievement, a finding that supports the benefit of preschool programs. Children who score poorly on academic assessments before entering kindergarten are more likely to become teen parents, engage in crime, and be unemployed as adults (Duncan, Ludwig, & Magnuson, 2007). Preschool gaps in cognitive and socio-emotional skills tend to persist through the school years and into later life. By the end of high school, the gap in achievement test scores between white and black children is at least as large as the preschool gap (Zhai et al., 2010).

Early intervention is essential for assisting children deemed "at-risk" in overcoming the obstacle of poverty. Children can be identified at-risk for many reasons, including, but not limited to, poverty, lack of maternal education, limited English

speaking, low birth weight, and medical impairments. Whatever criteria is used, the outcomes have the same implications: “At-risk” children are more likely to progress slowly in school, with risk of low grades, retention, and special education placement (Neuman, 2007). Recent research has shown that early interventions can produce meaningful, sustainable gains in cognitive, social and emotional development for high-risk children. Sturrock (2005) reports on several studies that emphatically suggest the benefits of preschool not only for economically disadvantaged children, but for all children. Preschool attendance provides a boost in language and math skills that all children need. She mentions in her report that “more is not better; but the quality of the preschool is what is going to impact not only academics, but also the important aspect of social and emotional development of young children” (Sturrock, 2005).

High quality preschool interventions have a positive impact on high poverty children’s general cognitive abilities and reading achievement. Providing opportunities for children to talk and develop language skills is an important aspect of high quality preschool programs (Wasik & Bond, 2006). Findings presented by Wasik and Bond (2006) showed that children from high-poverty homes can show significant increase in the size of their vocabularies if they have the appropriate opportunities to learn. Given the fact that children from high-poverty homes have deficient vocabularies because of their having relatively infrequent communicative exchanges with their primary caregivers, it is important that these children have increased opportunities to express themselves at school (Wasik & Bond, 2006).

Further research shows that there is substantial evidence that language and pre-literacy skills account for individual differences in learning to read. Therefore, it is

important that dialogic reading and related activities be present during the preschool years. These activities have been shown to enhance language and pre-literacy skills which, in turn, help children in learning to read and in other academic tasks when they begin school (Whitehurst et al., 1994).

According to decades of scientific research, the years before kindergarten are critical learning years for young children. At this age, children are ready to learn early reading and math skills, simple science concepts, and how to get along and work in group settings. For children to be successful readers, they must have mass exposure to early language experiences. Young children who have good vocabularies and who are taught early reading skills before they start school are more likely to become good readers and to achieve academic success throughout their school career (U.S. Department of Education, 2005b).

Overall, the findings in these studies provide positive support for early intervention, particularly for children from poverty. Early intervention provides a positive impact on cognitive development. Furthermore, intervention in the early years leads to greater school success, including an increase in appropriate socialization skills that are crucial for attending kindergarten.

### **The Impact of Parental Involvement on Early Childhood Development**

Parent involvement is defined broadly to include various activities that allow parents to participate in the educational process at school and at home. Epstein's framework for parental involvement suggests that six types of involvement are needed in a school's comprehensive program to share responsibilities with families for the education of children. The six basic types are: (a) Parenting, which requires schools to

help parents understand child development; (b) Communication about school activities and programs; (c) School involvement including providing opportunities for parents to volunteer; (d) Learning at home which includes educating the parents about the academic expectations, how to help children with homework, and other curriculum related activities; (e) Involvement in decision making through PTA, school planning committees, etc.; and, (f) Collaboration with community including mentoring, field trips, career day, etc. (Epstein, 2009).

A report from Vanderbilt University shifts the thinking from the variables that influence whether and how a parent will become involved to variables that influence how parental involvement will have a positive influence on educational outcomes. The report discusses three primary mechanisms of parental influence on children's educational outcomes – specifically, modeling, reinforcement, and direct instruction (Hoover-Dempsey & Sandler, 1995).

First, parents influence their children's education outcomes through modeling of school related behaviors and attitudes. In involving themselves in aspects of their children's educational lives, parents behave in ways that demonstrate that activities related to schooling are worthy of adult interest and time. For example, asking the child about their school day, a specific assignment, or even meeting with the teacher about the child's progress.

Secondly, parents influence their children's educational outcomes by reinforcing specific aspects of school-related learning. In involving themselves in aspects of children's schooling, parents often give their children interest, attention, praise, and rewards related to behaviors fundamental to varied aspects of school success. Assuming

that the rewards are applied in ways that do not interfere with the role and development of intrinsic motivation, reinforcements are important because they help elicit and maintain child behaviors central to school success.

Third, parents influence their children's educational outcomes by direct instruction. Direct instruction takes place in two primary forms, which tend to support different learning outcomes for children. Parents who engage primarily in direct, close-ended instruction (involving orders, commands, and requests for correct answers) will tend to promote factual learning and knowledge, but will not tend to influence the child toward higher levels of cognitive complexity. Parents who engage in direct, open-ended instruction (involving questions and requests to plan, anticipate, and explain) will tend to promote higher levels of cognitive complexity and ability (Hoover-Dempsey & Sandler, 1995). Regardless of the mechanism, this report shows that parental involvement has a direct positive effect on the child's learning outcomes.

The earliest form of parental involvement is through language and conversations with children. Further, most children acquire language through interactions with adults and peers who use language in ways that are consistent with the majority culture and correspond to the printed work (Wasik & Bond, 2006). Children's early learning environments differ profoundly across lines of both race and class. For example, compared with kindergarteners from families in the bottom fifth of the socio-economic distribution, children from the advantaged fifth are four times as likely to have a computer at home, have three times as many books, are read to more often, watch far less television, and are more likely to visit museums or libraries (Duncan et al., 2007).

One study found that three year olds in families of low socio-economic status had half the vocabulary of their more affluent peers, which in turn could be explained by the lower quality and quantity of parental speech (Duncan et al., 2007). Many children raised in poverty have limited access to opportunities to develop language and literacy skills in the homes. Risley & Hart (1995) reported that by age 3, children in poverty were already well behind their more affluent peers in their acquisition of vocabulary and oral language skills. Snow and Griffin (1998) also reported that children of poverty lack necessary pre-literacy skills at the beginning of kindergarten. Neuman (2007) reports that when children receive responsive, consistent caregiving in safe, stimulating settings, they can make remarkable recovery from the devastations of poverty. They can learn how to form healthy relationships with others, become eager to learn, and develop the skills and knowledge necessary to finish school and build a productive life (Neuman, 2007).

Parental involvement is crucial to children's language development and early vocabulary skills. When acquired through adult interaction, such skills can lead to early school success. Research confirms the importance of language interaction and its profound influences on vocabulary development and reading proficiencies (Neuman & Dwyer, 2009). A landmark study of early language development by Risley and Hart (1995) showed that children who scored highest in reading and math at age 10 were reported to have heard 45 million words from birth to age 3 –equivalent to 30,000 words per day – as compared with those children who scored lowest at 13 million words (Risley & Hart, 1995).

A research study reported in Science News found that students do much better in school when their parents are actively involved in their education. It was found that parents' effort is consistently associated with higher levels of achievement, and the magnitude of the effect of parental effort is substantial. So much so that schools would need to increase per-pupil spending by more than \$1,000 in order to achieve the same results that are gained with parental involvement (Houtenville & Conway, 2008).

Further research conducted on parental involvement and child outcomes above and beyond the influence of instruction found that parent involvement was significantly associated with higher levels of school readiness and word analysis skills. In addition, parent involvement was associated with significantly higher 3<sup>rd</sup> grade reading achievement (Graue, Clements, Reynolds, & Niles, 2004). Increased family support and family school relations provide children with a cognitive advantage at school entry that initiates a chain of positive effects that lead to better school performance and adjustment culminating in higher rates of school completion and lower rates of delinquency. Another mechanism of effects is associated with family support behaviors through which changes in parenting practices enhances children's school achievement and social adjustment; and, thus, contributes to long-term effects of preschool participation.

Further findings presented in this research showed that curriculum practices in preschool and parent involvement promote children's school readiness and early achievement patterns that are crucial for promoting lasting effects. Furthermore, it was found that curriculum emphasizing phonics and a variety of educational activities, parent involvement in school, and the length of preschool, were significant predictors of school readiness. Increased school readiness leads to greater school achievement and



performance, culminating in higher educational attainment and better social adjustment (Graue et al., 2004).

Parent involvement is considered a critically important component in children's educational and cognitive development. Whether it is helping with homework, or visiting school, it is widely believed that parent involvement at home, in school, and in the classroom has a positive influence on academic achievement and school adjustment. Parent involvement is increasingly linked to school reform and to programs that improve the school success of children at-risk, particularly in low-income and minority children (Reynolds, 1992).

Although many studies have shown a strong correlation between parental involvement and student achievement, few have investigated the individual contributions that mothers and fathers make to their children's schooling. There is even less research that examines the overall role of fathers' involvement in their children's academic performance. This dearth of specific research prompted a study by Flouri and Buchanan (2004) to determine what impact paternal involvement has on student achievement. The study was set up under certain beliefs. First, fathers who are involved with their children are likely to engage their children in physical play and parent-child play, specifically the parent's ability to be responsive to the child's initiative allowing for a nurturing give and take in their play. Secondly, in families where fathers are involved, mothers are also involved – therefore, children who are raised in such families benefit greatly from having two highly involved parents. Thirdly, fathers are more likely to be involved when the co-parental relation is good. And, therefore, in families where the father is involved, the

overall family context in which children are raised is positive, which is an important factor leading to overall positive child outcomes (Flouri & Buchanan, 2004).

Another study, by Flouri and Buchanan (2004), examined the role of father involvement at age 7 and mother involvement at age 8 in children's educational attainment by age 20. This particular study found that father involvement independently and significantly predicted educational attainment by late adolescence. This study also speaks to the theory that children from two parent homes are more likely to have the level of parent support needed to be successful in school and in life.

Another study from California State University, which was conducted by William Jeynes, sought to qualify the following four questions surrounding parental involvement in education:

1. Can parental involvement really improve the outcomes of urban children?
2. Do school programs of parental involvement positively influence urban children?
3. What aspects of parental involvement help those students the most?
4. Does the relationship between parental involvement and academic achievement hold across racial groups?

The results of this study indicate that parental involvement has a positive impact on children's academic achievement. This overall result held for all measures of academic achievement that were examined. It was found that school parental involvement programs also had a positive impact on student achievement.

In addition, this study examined specific components of parental involvement to examine which aspects influenced student achievement. One of the patterns that emerged

from the findings is that subtle aspects of parental involvement (e.g. parental style and expectations) had a greater impact on student educational outcomes than some of the more demonstrative aspects of parental involvement, such as having household rules and parental attendance and participation at school functions. Perhaps the most encouraging pattern that emerged from the association between parental involvement and student achievement was that it held across race. This result is especially noteworthy because these findings suggest that parental involvement may be one means of reducing the achievement gap that exist between white students and some racial minority groups (Jeynes, 2007). The findings of this study give an overall sense of the extent of the influence of parental involvement. This study also gives teachers and parents guidance about those aspects of parental involvement that are most helpful.

Additional research concerning parental involvement in early intervention sought to determine whether the frequency in which parents participated in parental activities during preschool and kindergarten years have an impact on student reading achievement; moreover, whether the frequency in which parents participated in parental activities in preschool and kindergarten had an impact on grade retention and special education placements (Miedel & Reynolds, 1999). The findings of the research revealed that parental involvement in preschool and kindergarten were positively associated with kindergarten reading achievement. Furthermore, the study found a correlation between parental involvement in preschool and kindergarten and grade retention and special education placement through eighth grade. Additionally, it was found, after controlling for background factors, that weekly (or more) parent participation in preschool and kindergarten activities was significantly associated with lower rates of grade retention

during elementary school. In addition, children whose parents reported being involved in school weekly or more were 38% less likely to be retained through age fourteen, and resulted in less cases of special education placement (Miedel & Reynolds, 1999).

Five recurring findings have been identified from parental involvement research. First, regardless of educational level, ethnic background, or income level, parents want their children to be successful. Second, parent involvement in education refers to participation at school and at home. In fact, given many parents' work demands and situational family barriers, more parents are available to participate at home. This type of parental involvement is being recognized more by educators, and parental involvement programs that are successful are tapping in to the "at-home" involvement. A third finding is that parents are involved to a greater and more consistent degree when they view their participation as directly linked to student achievement. Fourth, school and teacher efforts to involve parents are more influential on parents' actual involvement than are parents' educational or income levels. Fifth, the notion of a shared responsibility for student learning – commonly referred to as "collaboration" – is recognized as essential for success of all students (Christenson, Rounds, & Gorney, 1992).

### **Play and Socialization: Impact on Early Literacy**

Children today are playing less at home, outdoors, and at school. According to a national Kaiser Family Foundation survey, children in the two-to-seven year old age range now average about three hours per day in front of screens (Carlsson-Paige, 2008). Moreover, this is time not being spent in child-centered play, which commonly leads to the overall diminished capacity of children to engage in deeply imaginative play. More and more, children are coming from families with working parents who often work late

hours and are dependent on televisions, computers, or other structured activities to occupy their children's time. Even teachers have had to cut back on recess and open-ended play in order to meet the demands and pressures of a test-driven curriculum.

Play is one of a child's most valuable resources; vital to their social, emotional, and cognitive growth. Through play, children make sense of the world around them and work through new experiences, ideas, and feelings (Pellegrini, Kato, Blatchford, & Baines, 2002). Play can lead to the development of problem-solving skills, creativity, divergent thinking, and language acquisition (Tsao, 2002). Today, children commonly imitate and "play" what they have seen in movies, television and video games. Often what children imitate are the models of aggression and violence that are so pervasive in the media.

None the less, children must be allowed the opportunity to manipulate materials through authentic play. Through such experiences, children are building a foundation of understanding for the concepts and skills we want them to learn. When children construct their own knowledge and ideas through play and hands on activities that make sense to them, their knowledge builds in a solid and unshakeable way (Carlsson-Paige, 2008). Research shows that children who engage in complex forms of socio-dramatic play have greater language and social skills, more empathy, and more imagination when compared to non-players. Children who participate in this type of play are less aggressive, show more self-control, and have higher levels of thinking (Miller & Almon, 2009).

Play also has an impact on social and emotional learning. Writers in the field of social and emotional learning list many skills and competencies that are vital to success

in school and in life as a whole, such as the ability to manage distressing emotions, increased sensitivity to how others feel, impulse control, establishing positive relationships, and learning to resolve conflict. The social and emotional skills considered vital for success in school begin to build during the early years, and to a large extent, they develop through play. As children play, they learn about impulse control and are able to develop more self-regulatory social behavior (Carlsson-Paige, 2008).

Unfortunately, kindergarten has changed radically within the last two decades. Children spend more time being taught and tested on literacy and math skills than they do learning through play and exploration, exercising their bodies, and using their imaginations. Many kindergartens use highly prescriptive curricula geared to new state standards and linked to standardized tests. Kindergarteners are now under great pressure to meet inappropriate expectations; including academic standards, that until recently were reserved for first grade. As a result, they are being robbed of the benefits of play. Researchers believe that this is contributing to a rise in anger and aggression in young children, reflected in increasing reports of severe behavior problems (Miller & Almon, 2009).

The Alliance for Childhood reported on nine studies focused on the role of play, child-initiated learning, highly structured curricula, and standardized testing. They all point to the same conclusion: kindergarten is in serious trouble (Miller & Almon, 2009). The research delved into how children spend their time in urban and suburban public kindergarten classes, what materials are available to them, and the attitudes and beliefs of the adults who are charged with educating and caring for them.

The nine studies reveal the following findings:

1. In a sample of 254 New York City and Los Angeles kindergarten classes, a preponderance of time is devoted to teaching literacy and numeracy, and to testing and test preparation.
2. Preschool and kindergarten children benefit from play and playful learning, from choosing their own activities, and from individual and small-group pursuits rather than whole group ones.
3. A sample of kindergarten teachers in New York City and Los Angeles report that imagination and dramatic play is disappearing because of lack of materials and funding, lack of support from school administrators, and curricula that do not allow for such activities.
4. The pervasive use of standardized tests as a method to measure children's progress in literacy and math has become an established part of kindergarten education, in spite of a consensus among educational testing professionals that the results of such testing of children under age eight are subject to serious errors and their use is largely invalid.
5. Scripted teaching and other highly didactic types of curricula are widely used in kindergarten despite a lack of scientific evidence that they yield long-term gains.
6. The push for more academics in early education has reduced time for unstructured play, even as mothers and pediatricians have grown deeply concerned about its demise.
7. The urge to play is still alive in children and needs to be nurtured.

The research provided by the Alliance for Childhood does not call for laissez-faire, loosely structure classrooms; rather, it calls for classrooms that are rich in child-initiated play, and playful classrooms with focused learning (Miller & Almon, 2009). In response to the research presented by the Alliance for Childhood, Nancy Carlsson-Paige (2008) offered the following:

The research is clear. Faster is not better when it comes to early education; young children need play and hands-on interactions for genuine learning to occur. We must reverse this destructive trend and develop education policies that are grounded in research and theory in child development and early childhood education.

Current kindergarten standards are at the level of first grade standards from twenty years ago. Forcing children – particularly those identified as “at-risk” – to meet developmentally inappropriate standards has caused an increase in kindergarten retention, as students fall behind. The kindergarten retention rate in Texas rose by two and a half times from 1994-2004 – the highest increase in all elementary grades (Miller & Almon, 2009). Furthermore, due to the increase in academic rigor and the decrease in child-initiated play, kindergarten suspensions and expulsions are on the rise. Aggression and other behavioral difficulties are showing up in the kindergarten classrooms at an alarming rate.

Journalist Peg Tyre (2008), author of the book *The Trouble with Boys*, summarized the research on the problems young boys face in schools:

The way we educate our children and the messages they get from the community have changed a great deal in the last 15 years. I’ve come to



believe from my research that many of these changes, although well-intentioned, have been bad for boys. Little children get less and less unstructured free time. In school, we've had an acceleration of academics, a narrowing of the curriculum and, in an effort to boost test scores, many schools have a schedule that isn't in line with what is developmentally appropriate for a lot of children, especially boys. In our post-Columbine world, there is also less tolerance for boy behavior. Anti-violence policies, which I think deny boys (who for better or worse, think and play a lot around violence) a chance to be their authentic selves in school.

A Call to Action on the Education of Young Children, issued by the Alliance for Childhood (2005), expressed serious concern about the ways early childhood education was contributing to pressure and stress in children's lives. The statement, which was signed by hundreds of renowned educators, authors, and researchers, reads (in part) as follows: "...current trends in early education policy and practice heighten pressure and stress in children's lives, which can contribute to behavioral and learning problems."

In one study of anxious children, those who were allowed to engage in make-believe play showed lower stress levels than those who were not allowed to play. This clinical finding confirms what most observant parents and teachers of young children have known for a long time. It is through open-ended play that children work through and make sense of scary, confusing, and frustrating experiences (Barnett, 1995).

Through play, children also find purpose for literacy in their everyday lives. In a study conducted by Strickland and Morrow (1989), it was found that by providing literacy materials in a free-play environment, students found functional use for reading

and writing. In short, these students were able to recognize the need to read and write. By simply placing books, pencils, markers, and paper in the dramatic play area, children showed an increase in literacy behaviors (Strickland & Morrow, 1989).

The relationship between play, the classroom environment, and literacy learning has been studied and discussed for decades by seminal thinkers. Piaget (1962) stressed the importance of play in developing representational thought. He believed that, through play, children assimilate new information and consolidate it with past experiences. Vygotsky (1966) theorized that play allows a child to exceed the bounds of the immediate stimulus and thus to learn to use symbolic, abstract levels of thought. He believed that free play activities are valuable in promoting cognitive development generally and literacy development in particular. Pellegrini (1980) noted relationships between kindergarteners' levels of play and their emergence into reading, writing, and language. He found that symbolic play, which demands higher levels of cognitive involvement, predicted higher scores on standardized achievement tests (Morrow & Rand, 1991).

In a study of the effect of manipulating the environment on literacy behaviors, Morrow and Rand (1991) evaluated the effects that environmental changes in early childhood activity centers and patterns of teacher guidance had on children's literacy behaviors. In this study there were four different groups all with different play environments.

The first group was provided with paper, pencil, and books in their play environment. Their teachers introduced the materials, discussed possible uses of the materials, reminded the children of the materials each day, and encouraged and guided children in potential uses of the material. They suggested that the children write stories,

recipes, shopping lists, read books, write notes to friend, read books to dolls, and take telephone messages. Their teachers also modeled these behaviors during play time when the materials were first introduced.

The second group was set up thematically with teacher guidance. In this group, the dramatic play areas were designed to represent veterinarians' offices. Each office contained a waiting room, chairs, a table filled with magazines, books and pamphlets about pet care, posters about pets, office hour notices, and a sign advising visitors to sign in. Play areas also included a telephone, patient folders and other materials that would be found in a veterinarian's office. Teachers guided the students in the use of the various materials during free-play time in the veterinarian's office, for example, by reminding the children to read to pets in the waiting area, fill out forms with prescriptions, and fill out forms with personal information about their pet. The teacher also modeled behaviors by participating in play with the children when the materials were first introduced.

Next, in the third group, the dramatic play area was set up identically to the second group; however, teachers only mentioned the presence of literacy materials, and offered children no guidance in their use. The materials were mentioned only when they were first placed in the dramatic play areas.

The fourth and final group was set up as the control group. Teachers in this group made no changes at all in dramatic play areas, nor did they suggest any literacy behaviors that children could try during play.

The study used statistical analyses to determine whether there were differences among the groups in the average number of children who participated in literacy behaviors during free-play periods. The results showed that the number of literacy

behaviors demonstrated by children in the paper, pencil, books with adult guidance group and the thematic play with adult guidance group were significantly greater than the number of behaviors demonstrated by children in either the thematic play without adult guidance group or the control group (Morrow & Rand, 1991). This study is significant because it makes the correlation between teacher-guided play and early literacy behaviors in young children. The modification and design of a classroom can have an important impact on children's literacy behavior, as does the teacher involvement, further solidifying the argument for early childhood education.

In a report on creating connections between language, literacy, and play, three key concepts emerged. First, it was stated that young children naturally incorporate literacy actively into their play. Literacy, in other words, is not an unwanted intruder into play experiences. When playing grocery store, children spontaneously scribble shopping lists; and when playing "babies", they readily pretend to read storybooks to their make-believe children. When children play, they integrate what they see in everyday life, which includes literacy practices (Roskos, 2005).

Secondly, it was stated that the amount of play children do in conjunction with literacy is influenced by the physical and social environment in which they play. Play settings that richly offer children literacy-related ideas, props, and tools, stimulate more reading and writing interactions than do play places that are less well provisioned. A further benefit is that children make sense of literacy as it applies to the real world.

Lastly, it is clear that in play and literacy, certain foundational mental processes may be shared. The mental work of letting something represent something else in play is akin to understanding that written words represent language. Likewise, the mental effort

to build a pretend play story involves elements structurally similar to those found in comprehending and composing written stories (Roskos, 2005).

As straightforward as this seems, incorporating play into the learning-to-read process faces some tough challenges. Many parents, teachers, and adults do not view play as a real opportunity for academic learning. It is critical that the message be sent clearly that play is essential to early literacy behaviors. In play, children use language to practice the essential communication skills that underlie literacy-telling, narrating, and describing (Carlsson-Paige, 2008).

This is a time when social influences are robbing children of healthy play, one of the most important vehicles they have for optimal development and learning. Educators need to step in, with the awareness and skills that are uniquely theirs, to reclaim this powerful resource for children. Taking active steps to encourage imaginative and beneficial play that truly serves children's needs will not only reclaim play for them, but also give children the best foundation possible for success in school and in their lives both now and in years to come.

## Summary

A substantial body of research regarding the effects of preschool education on young children's learning and development was reviewed. Much of the evidence is from rigorous studies, and findings have been replicated with considerable variations in program design, populations served, and social context. These studies provide a sound basis for conclusions about the benefits of publicly-funded preschool education, and they can help inform key decisions about who to serve and how programs should be designed.

The research showed that many different preschool programs have been shown to produce positive effects on children's learning and development, but those effects vary in size and persistence by type of program. Well-designed preschool programs produce long-term improvements in school success, including higher achievement test scores, lower rates of grade repetition and special education placements, and higher overall educational attainment. Some preschool programs are also associated with reduced delinquency and crime in childhood and adulthood.

The strongest evidence suggests that economically disadvantaged children reap long-term benefits from preschool. However, children from all other socioeconomic background have been found to benefit as well. Increasing public investment in effective preschool education programs can produce substantial educational, social, and economic benefits. State and local pre-kindergarten programs with high standards have been the most effective, and such programs need not be provided solely by public schools. Public schools, Head Start, and private childcare programs have produced similar results when operating with the same resources and standards.

## **CHAPTER THREE**

### **METHODOLOGY**

The purpose of this study was to determine whether a difference exists in school readiness and student achievement between eligible students who attended pre-kindergarten and eligible students who did not attend pre-kindergarten in the study district. For the purpose of this study, a student will be defined as eligible if they are coded economically disadvantaged in the state PEIMS system. School Readiness will be determined by beginning year TPRI data to include beginning letter sound identification, blending onset rhymes and phonemes, listening comprehension, and the total score from the social screener for the students who were in kindergarten in 2011-2012. Student achievement in third grade will be determined by the raw score on third grade TAKS for those students taking the math and reading sections as third graders in 2010-2011.

This chapter reviews research questions and includes a discussion of the research design, population, procedures for data collection, and the instrumentation.

#### **Research Design**

The research analyzed quantitative data from 24 elementary schools in a mid-size public school district in Houston, Texas, to determine the academic effects of pre-kindergarten attendance on kindergarten readiness and third grade academic success. The data included raw scores of third grade students on the 2010-2011 TAKS test in reading and math. Furthermore, the data set included TPRI information from kindergarten students who took the test in 2011-2012. The data set used from the TPRI included beginning letter sound identification, blending onset rhymes and phonemes, listening comprehension, and the total score from the social screener.

The data was merged with the district's PEIMS data to determine if these students had attended a pre-kindergarten program in the study district. The data was further disaggregated into gender and ethnicity.

### **Research Questions**

The following research questions were addressed in this study:

**Research Question One:** Is there a significant difference in the third grade 2010-2011 TAKS reading scores between eligible students who participated in public pre-kindergarten programs compared to those eligible students who did not participate in pre-kindergarten programs in the study district?

**Research Question Two:** Is there a significant difference in the third grade 2010-2011 TAKS math scores between eligible students who participated in public pre-kindergarten programs compared to those eligible students who did not participate in pre-kindergarten programs in the study district?

**Research Question Three:** Is there a significant difference in kindergarten readiness scores as measured by beginning of the year TPRI scores and The University of Texas Social Screener between eligible students who participated in public pre-kindergarten programs and those eligible students who did not participate in pre-kindergarten programs in the study district?

### **Population**

Two separate populations were used in this study to address the research questions. For research questions one and two, the sample was taken from students who qualified to attend pre-kindergarten in the year 2006-2007, and who took the reading and math sections of the TAKS test as third graders in 2010-2011. For research question



number three, the sample was taken from students who qualified for pre-kindergarten in the year 2010-2011, and who took the TPRI test at the beginning of kindergarten in 2011-2012.

Table 3.1 represents the total number of students in third grade who took the third grade reading and math TAKS in 2010-2011 and table 3.2 represents the number of students who took the TPRI test as kindergarteners in 2011-2012.

Table 3.1

*Number of Students Who Took the TAKS Reading and TAKS Math Test in the study school district (2010-2011)*

Sample	Year Eligible for Pre-kindergarten	Number of Students
Number of students who took the reading TAKS Test	2006-2007	1071
Number of students who attended Pre-kindergarten and took the reading test	2006-2007	680
Number of students who did not attend Pre- kindergarten and took the reading test	2006-2007	391
Number of students who took the math Test	2006-2007	1071
Number of students who attended Pre-kindergarten who took the math test	2006-2007	680
Number of students who did not attend Pre- kindergarten who took the math test	2006-2007	391

The data in Table 3.2 indicates the number of students who took the TPRI at the beginning of their kindergarten year in 2010-2011.

Table 3.2

*Number of Students Who Took the TPRI Test in the study school district (2011-2012)*

Sample	Year Eligible for Pre-kindergarten	Number of Students
Number of students who took the TPRI	2010-2011	1742
Number of students who attended Pre-kindergarten and took the TPRI test	2010-2011	726
Number of students who did not attend Pre-kindergarten and took the TPRI test	2010-2011	1016

The number of students in these tables includes students who met the criteria to attend pre-kindergarten based upon economic eligibility. Students who attended pre-kindergarten based on other qualifications were omitted. The table also includes students who moved schools within the selected district, but omitted students who left the district for any period of time.

### **Procedures for Data Collection**

Historical quantitative archival data was gathered from two different sources. Achievement data for third grade testing was collected from the district's TAKS file and analyzed. The kindergarten readiness data was collected from the district's TPRI file. Economic disadvantaged status was compiled from the PEIMS submission file that was submitted to the state. The data was analyzed to determine the correlation between pre-

kindergarten attendance and non-attendance on student achievement at school entry and again at third grade.

### **Instrumentation**

This study employed two different instruments to determine the dependent variable of student achievement; the Third Grade Texas Assessment of Knowledge and Skills (TAKS) and the Texas Primary Reading Inventory (TPRI). In addition, the University of Texas School Readiness Social Screener was used to determine the social aspects of school readiness.

TAKS was implemented in 2003 as the state of Texas's primary statewide assessment program. TAKS is designed by legislative mandate to be more comprehensive than its predecessors and to measure more of the state mandated curriculum. In addition, the Student Success Initiative (SSI), enacted by the Texas legislature in 1999, made satisfactory performance on the grade 3 reading assessment, and the grade 5 reading and math assessments a promotion criterion for Texas students.

The Texas Education Agency (TEA) confirms high validity for the TAKS test, and that it is an accurate evaluation of the state curriculum. TEA reports that TAKS reliability data is based on internal consistency measures. The particular measure used for TAKS is the Kuder-Richardson Formula 20 for test involving dichotomously scored (multiple choice) items, and the stratified coefficient alpha for TAKS tests involving a combination of dichotomously and polytomous (short answer and extended response) items. Most internal consistency reliabilities are in the high .80s to low .90s with reliabilities for TAKS being from .83 to .93 (TEA, 2011b).

The TPRI is a teacher-administered assessment of reading skills for children in kindergarten through second grade. It was designed to comply with the requirements of TEC 28.006 by facilitating a teacher's capacity to identify students at risk for reading difficulties in kindergarten, first grade, and second grade, and set learning objectives for these at-risk students.

Table 3.3 shows the reliability of the kindergarten screener.

Table 3.3

*Overall Reliabilities for Kindergarten Tasks*

Subtest	N	Alpha
Screen BOY	743	0.90
Screen 1 - Letter Sound	743	0.85
Screen 2 - Blending Onset-Phonemes (8 Items)	743	0.88
Screen EOY	743	0.86
Screen 3 - Letter Sound (10 Items)	743	0.85
Screen 4 - Blending Onset-Rhymes and Phonemes (8 Items)	743	0.91
Phonological Awareness	686	0.91
Rhyming Task (5 Items)	687	0.80
Blending Word Parts Task (5 Items)	686	0.77
Blending Phonemes Task (5 Items)	689	0.73
Deleting Initial Sound Task (5 Items)	689	0.90
Deleting Final Sound Task (5 Items)	687	0.87
Graphophonemic Knowledge	501	0.93
Letter Name Identification Task (26 Items)	501	0.93
Letter to Sound Linking Task (10 Items)	688	0.84
Listening Comprehension		
Listening Comprehension BOY (6 Items)	224	0.76
Listening Comprehension MOY (6 Items)	221	0.76
Listening Comprehension EOY (6 Items)	230	0.76
Word Reading		
Optional Task (10 Items)	689	0.92
Book and Print Awareness		
Optional Warm Up (5 Items)	611	0.36

*Note.* BOY=Beginning of Year; MOY=Middle of Year; EOY=End of Year.

The reliability analysis consistently shows excellent reliabilities for all of the screening tasks. All but one TPRI task – that is, Book and Print Awareness – are at a

good-to-excellent range. For this reason, it is an optional task (“TPRI - Early Reading Assessment,” n.d.).

In addition to the overall reliability, there is no evidence of systematic bias by virtue of ethnicity or gender for any of the forms of TPRI. The overall rates of differential item functioning analysis were below 5% and no consistence patterns of bias were reported (“TPRI - Early Reading Assessment,” n.d.).

As part of the Texas School Readiness Certification System, kindergarten teachers rated children’s social competence using the Social Competence Screener. This measure is a subscale from the teacher Social Competence and Behavior Evaluation (SCBE-30). Specifically, this 10-item subscale measures social behavior in children (e.g., socially integrated, tolerant, cooperative) and has demonstrated high inter-rater (.83-.87) and test-retest reliability (.82). Specific example items include: “Comforts or assists another child in difficulty,” and “Works easily in a group.” Each item utilizes a six-point scale (1=almost never occurs, and 6=almost always occurs). The full SCBE-30 was designed for use with children aged 2.5 through 6 years. The measure is comprised of the following three scales: social competence, anxiety-withdrawal, and anger aggression. It has been successfully validated and used in numerous studies. The full questionnaire examines social competence and behavioral/emotional adjustment in preschool children by tapping overall emotional expression, social interactions with peers, and interactions with teachers. There is both an English and Spanish version available, as well as a parent and teacher version that identifies both positive and negative behavioral tendencies along each construct being measure (LaFreniere & Dumas, 1996). The complete 10 item questionnaire can be reviewed in Appendix C.

## **Data Analysis**

Quantitative techniques were used to analyze the data from the research sample in order to determine the correlation of pre-kindergarten attendance to academic success. Descriptive statistics were employed to summarize and organize the data in an effective format using mean scores, standard deviations, frequencies, and correlation as part of the descriptive analysis. The subsequent findings are presented in multiple displays including charts and tables.

All data is archival, historical data. Additionally, other than data that was excluded for not substantially meeting the intent of the study, no data was manipulated nor changed. With regard to items and information excluded from this study, such data is discussed in the limitations section. This study focused on whether there was a correlation between pre-kindergarten attendance and school readiness and school success.

The analysis was performed through the use of the Statistical Package for the Social Sciences (SPSS), an electronic driven statistical software program, in order to answer the research questions. Specifically, a two-sample t-test with equal variance was first performed to determine if a statistically significant difference existed in TAKS raw scores when comparing the two variables of pre-kindergarten attendance. Furthermore, a multiple linear regression test was performed on each group to assess if gender and ethnicity further impacted the results of school readiness and academic success. These tests were repeated for the TPRI and Social Screener. The results of the t-test and linear regression will be discussed in Chapter Four of this study.

## **Scope and Limitations**

This study was limited by:

1. The population consisted of students in only one school district.
2. There are actually two different studies within this research. The student groups are from two different samples of students. The sample of students who were used for the TAKS correlation are currently in fourth grade. The sample of students who were used for the TPRI correlation are currently in first grade.
3. Students who qualified for pre-kindergarten solely on the criteria of having a language other than English as their first language were omitted from the study.
4. The TPRI is administered by teachers; and is, therefore, subject to possible bias.
5. The TPRI data is entered by classroom teachers; and is, therefore, subject to data entry errors.



## **CHAPTER FOUR**

### **RESULTS**

#### **Introduction**

The purpose of this study was to determine if pre-kindergarten attendance resulted in increased school readiness for kindergarten students, and if pre-kindergarten attendance resulted in higher student achievement for third grade students in the study district. Specifically, this study compared the 2010-2011 reading and math raw scores of third grade students who attended pre-kindergarten in the study district and those who did not. In order to determine school readiness, this study compared the 2011-2012 TPRI and social screener data of students who attended pre-kindergarten in the study district to those who did not.

The participants in the first portion of this study, which examined student achievement through TAKS scores, comprised of 1,071 third grade students who took the reading and math sections of the TAKS test. Of the 1,071 students, 680 attended pre-kindergarten in the study district and 391 did not attend pre-k in the study district. Table 4.1 summarizes the study participants and identifies the number of participants by ethnicity and gender.

Table 4.1

*Descriptive Statistics of Study Participants*

Category	Number of Participants
Male	533
Female	538
African American	377
Hispanic	588
White	84
Other	22
Total	1071

The participants in the second part of the study, which examined school readiness through TPRI and the social screener, comprised of 1,742 kindergarten students who took the 2011-2012 TPRI test at the beginning of their kindergarten year. Of the 1,742 students, 726 attended pre-kindergarten in the study district, and 1,016 students did not attend pre-kindergarten in the study district. Table 4.2 summarizes the study participants by ethnicity and gender.

Table 4.2

*Descriptive Statistics of Study Participants*

Category	Number of Participants
Male	886
Female	856
African American	832
Hispanic	519
White	288
Other	103
Total	1742

**Research Question One**

The first question that was addressed in this study was whether pre-kindergarten attendance made a significant difference in third grade TAKS reading scores. To answer this question, the 2010 reading TAKS raw score was analyzed. The raw score is the actual number of correct answers the student obtained on the test. The data was analyzed to determine if there was evidence of a correlation between pre-kindergarten attendance and increased scores. Thus, the raw score for the reading TAKS test served as the dependent variable and pre-kindergarten attendance served as the independent variable. The data was analyzed using SPSS statistical analysis. A two-sample t-test with equal variance was performed to determine if pre-kindergarten attendance made a significant impact on student achievement in third grade. Table 4.3 summarizes these findings for third grade students who attended pre-kindergarten compared to those who did not attend

pre-kindergarten. The mean difference reported was .318. The mean difference for the two groups demonstrated a negative directional difference. A probability level of 0.4488 was reported, indicating that there was not a statistically significant difference in the reading raw scores for the two groups.

Table 4.3

*T-test of Grade 3 Reading Raw Scores*

Group	Obs.	Mean	Standard Error	Standard Deviation	95% Confidence Interval
Pre-kindergarten	680	28.11	.25	6.50	27.62, 28.60
Non Pre-kindergarten	391	28.42	.35	6.84	27.74, 29.10
Combined	1071	28.22	.20	6.63	27.82, 28.62
Difference		-.32	.42		-1.14, .51

*Note.*  $t = -0.7577$ ;  $p = .4488$ .

In addition to the t-test, a linear regression was run to further determine if the raw reading scores were impacted by ethnicity and gender. The dependent variable in this analysis was reading raw score and the independent variables were gender and ethnicity. Table 4.4 summarizes the findings of the linear regression. The linear regression results showed that both ethnicity and gender impacted the raw reading scores, and are more statistically significant to the outcome of score than the pre-kindergarten/non pre-kindergarten grouping. These results also revealed that girls had a higher overall reading raw score than did boys.

When analyzing the effect of ethnicity on the reading raw scores, it was found that there was a statistically significant difference in the three measured ethnicities- African-American, Caucasian, and Hispanic. A probability level of 0.00 was reported when comparing African-American students to Hispanic students, which was significant. Moreover, Hispanic students outscored African-American students on the reading TAKS test. A comparison of African-American to Caucasian students showed a probability level of 0.036 with Caucasian students outscoring African-American students. Once again, this particular finding was statistically significant.

Table 4.4

*Linear Regression of Grade 3 Reading Gender and Ethnicity*

r-row	Coefficient	Std. Error	T	p> t	95% Confidence Interval
Pre-kindergarten/non pre-kindergarten	.66	.43	1.54	0.12	-.18, 1.49
Gender	1.85	.40	-4.60	0.00	-2.64, -1.06
Ethnicity AA-HIS	1.97	.44	4.51	0.00	1.11, 2.83
Ethnicity AA-CAU	1.65	.79	2.10	0.04	.11, 3.20
Constant	26.99	.74	36.52	0.00	25.54, 28.44

*Note.* AA=African American; HIS= Hispanic; CAU= Caucasian.

## **Research Question Two**

The second question that was addressed in this study was whether pre-kindergarten attendance made a significant difference in third grade TAKS math scores. To answer this question, the 2010 TAKS math raw score was analyzed. The raw score is the actual number of correct answers the student obtained on the test. The data was analyzed to determine if there was evidence of a correlation between pre-kindergarten attendance and increased scores. Thus, the raw score for the TAKS math test served as the dependent variable and pre-kindergarten attendance served as the independent variable. The data was analyzed using SPSS statistical analysis. A two-sample t-test with equal variance was performed to determine if pre-kindergarten attendance made a significant impact on student achievement in third grade. Table 4.5 summarizes these findings for third grade students who attended pre-kindergarten compared to those who did not attend pre-kindergarten. The mean difference reported was .810. The mean difference for the two groups demonstrated a positive directional difference. A probability level of 0.0511 was reported, indicating that there is not a statistically significant difference in the math raw scores for the two groups. However, this value is practically significant.

Table 4.5

*T-test of Grade 3 Math Raw Scores*

Group	Obs.	Mean	Standard Error	Standard Deviation	95% Confidence Interval
Pre-kindergarten	680	32.14	.24	6.34	31.66, 32.62
Non Pre-kindergarten	391	31.33	.35	6.87	30.65, 32.01
Combined	1071	31.84	.20	6.54	31.45, 32.24
Difference		.81	.41		-.00, 1.62

*Note.*  $t = 1.9525$ ;  $p = 0.0511$ .

In addition to the t-test, a linear regression was run to further determine if the raw math scores were impacted by ethnicity and gender. The dependent variable in this analysis was math raw score and the independent variables were gender and ethnicity. Table 4.6 summarizes the findings of the linear regression. The linear regression results showed that both ethnicity and gender impact the raw math scores, and are more statistically significant to the outcome of score than the pre-kindergarten/non pre-kindergarten grouping. The results revealed that girls had a higher overall raw score than did boys in math.

When analyzing the effect of ethnicity on the math raw scores, it was found that there was a statistically significant difference in the groups when comparing African-American students to Hispanic students, but no significance was found when comparing African-American students to Caucasian students. A probability level of 0.00 was reported when comparing African-American students to Hispanic students, which is statistically significant. Hispanic students outscored African American students on the math TAKS test. A comparison of

African- American to Caucasian students showed a probability level of .414 which was not statistically significant.

Table 4.6

*Linear Regression of Grade 3 Math Gender and Ethnicity*

m-row	Coefficient	Std. Error	T	p> t	95% Confidence Interval
Pre-kindergarten/non pre-kindergarten	-.45	.42	-1.06	0.29	-1.28, .38
Gender	-.70	.40	-1.75	0.08	-1.49, .08
Ethnicity AA-HIS	2.07	.44	4.77	0.00	1.22, 2.93
Ethnicity AA-CAU	.64	.78	0.82	0.41	-.90, 2.18
Constant	31.55	.74	42.88	0.00	30.10, 32.99

*Note.* AA=African-American; HIS= Hispanic; CAU= Caucasian.

### Research Question Three

The third research question addressed in this study was whether or not pre-kindergarten attendance had a significant effect on kindergarten readiness. To answer this question, key sections of the TPRI test, and the University of Texas' Social Screener were analyzed. Key sections of the TPRI included beginning letter sound identification, blending onset rhymes and phonemes, and listening comprehension. A two-sample t-test with equal variance was performed for each of the three sections of the TPRI, as well as the social screener, to determine if pre-



kindergarten attendance had a significant impact on the scores. Tables 4.7- 4.10 summarize these particular findings.

For beginning letter sound identification the mean difference reported was 6.27. The mean difference for the two groups demonstrated a positive directional difference. A probability level of 0.0001 was reported; thus, indicating that there is a statistically significant difference in beginning letter identification between the two groups. Students who attended pre-kindergarten performed better on beginning letter sound identification, than those who did not attend pre-kindergarten.

Table 4.7

*T-test of Beginning of the Year Kindergarten TPRI Scores-Beginning Letter Sound Identification*

Group	Obs.	Mean	Standard Error	Standard Deviation	95% Confidence Interval
Pre-kindergarten	726	6.63	.11	3.03	6.41, 6.85
Non Pre-kindergarten	1016	6.02	.11	3.48	5.80, 6.23
Combined	1742	6.27	.08	3.32	6.12, 6.43
Difference		.62	.16		.30, .93

*Note.*  $t = 3.8503$ ;  $p = 0.0001$ .

When analyzing blending onset rhymes and phonemes, the mean difference reported was 0.07. The mean difference for the two groups demonstrated a negative directional difference. A probability level of 0.6370 was reported; thus, indicating that there is no statistically significant difference in blending onset rhymes and phonemes between the two groups.

Table 4.8

*T-test of Beginning of the Year Kindergarten TPRI Scores-Blending Onset Rhymes and Phonemes*

Group	Obs.	Mean	Standard Error	Standard Deviation	95% Confidence Interval
Pre-kindergarten	726	3.23	.11	3.02	3.01, 3.45
Non Pre-kindergarten	1016	3.30	.09	2.99	3.12, 3.48
Combined	1742	3.27	.07	3.00	3.13, 3.41
Difference		-.07	.15		-.35, .217

*Note.*  $t = -0.4720$ ;  $p = 0.6370$ .

The next t-test analyzed listening comprehension between the two groups of students. For listening comprehension the mean difference reported was .36. The mean difference for the two groups demonstrated a negative directional difference. A probability level of 0.0001 was reported; thus, indicating that there is a statistically significant difference in listening comprehension between the two groups. Students who attended pre-kindergarten performed better on listening comprehension than those who did not attend pre-kindergarten.

Table 4.9

*T-test of Beginning of the Year Kindergarten TPRI Scores-Listening Comprehension*

Group	Obs.	Mean	Standard Error	Standard Deviation	95% Confidence Interval
Pre-kindergarten	726	3.23	.11	3.02	3.01, 3.45
Non Pre-kindergarten	1016	3.30	.09	2.99	3.12, 3.48
Combined	1742	3.27	.07	3.00	3.13, 3.41
Difference		-.07	.15		-.35, .217

*Note.*  $t = -3.9457$ ;  $p = 0.0001$ .

The final t-test analyzed the total score on the social screener in order to determine school readiness from a social aspect. For the social screener the mean difference between the two groups was reported at .23. The mean difference for the two groups demonstrated a negative directional difference. A probability level of 0.7181 was reported; thus, indicating that there is not a statistically significant difference in social readiness between the two groups.

Table 4.10

*T-test of Beginning of the Year Kindergarten Social Screener Survey*

Group	Obs.	Mean	Standard Error	Standard Deviation	95% Confidence Interval
Pre-kindergarten	726	46.96	.49	13.31	45.99, 47.93
Non Pre-kindergarten	1016	47.19	.41	12.97	46.39, 47.98
Combined	1742	47.09	.31	13.11	46.47, 47.71
Difference		-.23	.64		-1.48, 1.01

*Note.*  $t = -0.3611$ ;  $p = 0.7181$ .

In addition to the t-test, a linear regression model for each score adjusted for by gender and ethnicity was analyzed to determine if gender and ethnicity played a significant role in student performance on the measured sections of TPRI. Again, the measured sections include beginning letter sound identification, blending onset rhymes and phonemes, listening comprehension, and the social screener survey. Tables 4.11-4.14 summarize the subsequent findings.

For the linear regression analysis on beginning letter sound identification, the dependent variable in this analysis was the score for beginning letter sound identification and the independent variables were gender and ethnicity. The linear regression results showed that gender had an impact on student achievement on this section of the test. More specifically, girls outperformed boys in beginning sound identification.

When analyzing the effect of ethnicity on beginning letter sound identification, the results indicated that, when comparing African-American students to Hispanic students, there was a statistically significant difference, but no significance was found when comparing African-

American students to Caucasian students. A probability level of 0.004 was reported when comparing African-American students to Hispanic students, which is statistically significant. Hispanic students outscored African-American students on the beginning letter sound identification section of the TRPI. A comparison of African-American to Caucasian students showed a probability level of .881 which was not statistically significant. Table 4.11 summarizes the findings for this section of the TPRI.

Table 4.11

*Linear Regression of Beginning Letter Sound Identification Adjusted for Gender and Ethnicity*

Beg. Sound. recognition	Coefficient	Std. Error	T	p> t	95% Confidence Interval
Pre-kindergarten/non pre-kindergarten	-.61	.17	-3.62	0.00	-.93, -.28
Gender	-.69	.16	-4.24	0.00	-1.01, -.370
Ethnicity AA-HIS	-.53	.18	-2.90	.004	-.89, -.17
Ethnicity AA-CAU	.03	.23	0.15	.881	-.41, .48
Constant	7.69	.30	25.96	0.00	7.11, 8.27

*Note.* AA=African-American; HIS= Hispanic; CAU= Caucasian.

For the linear regression analysis on blending onset rhymes and phonemes, the dependent variable was the score for blending onset rhymes and phonemes and the independent variables were gender and ethnicity. The linear regression results showed that gender had an impact on student achievement on this section of the test. Specifically, girls outperformed boys on this section of the test.

When analyzing the effect of ethnicity on beginning sound identification, it was found that there was no statistically significant difference when comparing African-American students

to Hispanic students, but a significance was found when comparing African-American students to Caucasian students. A probability level of 0.262 was reported when comparing African-American students to Hispanic students, which is not statistically significant. A comparison of African-American to Caucasian students showed a probability level of .000 with a positive coefficient variable which indicates significance; specifically, Caucasian students outperformed the African-American students on this section of the test. Table 4.12 summarizes the findings for this section of the TPRI.

Table 4.12

*Linear Regression of Blending Onset Rhymes and Phonemes Adjusted for Gender and Ethnicity*

Blending	Coefficient	Std. Error	T	p> t	95% Confidence Interval
Pre-kindergarten/non pre-kindergarten	-.06	.15	-.039	.694	-.35, .24
Gender	-.45	.15	-3.10	.002	-.74, -.17
Ethnicity AA-HIS	.18	.17	1.12	.262	-.14, .51
Ethnicity AA-CAU	1.11	.20	5.45	0.00	.71, 1.51
Constant	3.36	.27	12.64	0.00	2.84, 3.88

*Note.* AA=African-American; HIS= Hispanic; CAU= Caucasian.

For the linear regression analysis on listening comprehension, the dependent variable was the score for listening comprehension and the independent variables were gender and ethnicity. The linear regression results showed that gender had an impact on student achievement on this section of the test. Specifically, girls outperformed boys on this section of the test.

When analyzing the effect of ethnicity on listening comprehension, the results revealed that there was no statistically significant difference when comparing African-American students

to Hispanic students with a probability level of 0.296. However, there was a statistically significant difference when comparing African-American students to Caucasian students. The comparison of African-American to Caucasian students showed a probability level of .000 with a positive coefficient variable which indicates significance; specifically, Caucasian students outperformed the African-American students on this section of the test. Table 4.13 summarizes the findings for this section of the TPRI.

Table 4.13

*Linear Regression of Listening Comprehension Adjusted for Gender and Ethnicity*

Listening Comp	Coefficient	Std. Error	T	p> t	95% Confidence Interval
Pre-kindergarten/non pre-kindergarten	.21	.09	2.20	0.02	.02, .39
Gender	-.18	.09	-2.00	.045	-.36, .00
Ethnicity AA-HIS	-.11	.10	-1.05	.296	-.31, .09
Ethnicity AA-CAU	.51	.13	3.97	0.00	.26, .76
Constant	3.37	.17	20.28	0.00	3.04, 3.70

*Note.* AA=African-American; HIS= Hispanic; CAU= Caucasian.

For the linear regression analysis on the social screener survey, the dependent variable was the total score for the social screener survey and the independent variables were gender and ethnicity. The linear regression results showed that gender had an impact on social readiness. More specifically, girls outscored boys on the social screener survey.

When analyzing the effect of ethnicity on the social screener, it was found that there was a statistically significant difference when comparing African-American students to Hispanic students, as well as when comparing African-American students to Caucasian students. When

comparing African-American students to Hispanic students a probability level of 0.002 with a positive coefficient variable was reported, indicating the Hispanic students outscored African-American students on the social screener survey. The comparison of African-American to Caucasian students showed a probability level of .0.00, with a positive coefficient variable which indicates significance; specifically, Caucasian students outscored the African-American students on the social screener survey. Table 4.14 summarizes the findings for the social screener.

Table 4.14

*Linear Regression of Social Screener Survey Adjusted for Gender and Ethnicity*

Listening Comprehension	Coefficient	Std. Error	T	p> t	95% Confidence Interval
Pre-kindergarten/non pre-kindergarten	-.16	.65	-.25	.801	-1.44, 1.11
Gender	-4.68	.63	-7.39	0.00	-5.92, -3.44
Ethnicity AA-HIS	2.21	.72	3.08	.002	.80, 3.62
Ethnicity AA-CAU	4.09	.88	4.62	0.00	2.36, 5.83
Constant	48.28	1.15	41.86	0.00	46.01, 50.54

*Note.* AA=African-American; HIS= Hispanic; CAU= Caucasian.

## Chapter Summary

This chapter presented and analyzed the data that answered each research question posed in this study. A demographic descriptive statistics table was presented for the research questions. In addition, a table representing the sample means and the test of significance for each question was provided. Research question #1 and #2 examined the data as it pertained to attendance in pre-kindergarten and the impact of such on reading and math TAKS, respectively. The results of



these questions showed that pre-kindergarten attendance had no significant impact on reading and math TAKS raw scores. Furthermore, analysis of the data showed that gender and ethnicity played a more significant role in student achievement than pre-kindergarten attendance.

Research question #3 examined the data as it pertained to attendance in pre-kindergarten and the impact of such on school readiness. School readiness was determined by analyzing scores from three sections of the beginning year TPRI test, as well as the overall score on the social screener. The results from the two-sample t-test showed that pre-kindergarten attendance had a positive impact on two of the four measured components; beginning letter sound identification and listening comprehension. The data was analyzed further with a linear regression to determine if gender and ethnicity had a significant impact on these components of the test. The analysis showed that female students outscored their male counterparts on every section measured. The test further showed that Caucasian students outscored African-American students on all sections except beginning letter sound identification. Also, Hispanic students outscored African-American students on beginning letter sound identification as well as the social screener survey.

These results indicate that pre-kindergarten attendance had no significant impact on student achievement on third grade TAKS or school readiness indicators. The data did show that ethnicity and gender is a more dominant indicator for student success.

## **CHAPTER FIVE**

### **DISCUSSION**

The purpose of this study was to determine the impact, if any, pre-kindergarten education had on kindergarten readiness and student success in third grade. The intent of the study was to analyze district data in order to determine whether the district's current pre-kindergarten programs are being successful in producing students who are academically and socially ready for kindergarten, and also to determine if the early start was generating long term academic success. This chapter provides an abridged summary of the data analysis and implications of the findings. Recommendations pertaining to future research are also outlined in this chapter.

The 2010-2011 TAKS reading and math data of 1,071 students enrolled in third grade in the study district were collected and analyzed. The complete participatory set was abstracted from the PEIMS data file. The students were categorized into two groups based on their pre-kindergarten attendance status and their math and reading raw scores were analyzed and compared across the groups.

Additionally, the 2011-2012 TPRI data of 1,742 students enrolled in kindergarten in the study district were collected and analyzed. Specific components of the TPRI that were analyzed include beginning letter sound identification, blending onset rhymes and phonemes, and listening comprehension. Furthermore, data from the University of Texas Social Screener was also analyzed. The students were categorized into two groups based on their pre-kindergarten attendance status, and their TPRI and social screener scores were compared across the groups.

## Summary of Findings

The findings of this research showed that attending pre-kindergarten impacted school readiness in two areas and showed no impact in one area of the TPRI. The areas that showed a positive correlation were beginning letter sound identification, and listening comprehension. The area that revealed no impact was blending beginning rhymes and phonemes. Another notable finding is that students who had attended pre-kindergarten showed no significant edge in socialization as identified by the University of Texas Social Screener Survey.

However, gender and ethnicity played an important role in school readiness. The data showed that female students performed better than their male peers on all four of the measures for school readiness. Furthermore, Caucasian students outperformed both their Hispanic and African-American counterparts in all areas except beginning sound identification. Also, Hispanic students outperformed African-American students in socialization and beginning sound identification.

As for longer term success, pre-kindergarten attendance did not have a significant impact on third grade TAKS scores in neither reading nor math. In spite of this finding, the research did show that gender and ethnicity played an integral function in the TAKS scores. On both reading and math, female students outperformed male students. Moreover, Hispanic students outperformed African-American students on both test, and Caucasian students outscored African- American students on the reading test.

The findings in this study contradict the fact that research has established that preschool education can produce substantial gains in children's learning and development (Barnett & Hustedt, 2003). Four year olds who attend pre-kindergarten programs are more successful in kindergarten and beyond – both academically and socially (Nores & Barnett, 2010).

On the contrary, the research supports findings by Marcon (2002) which states that while pre-kindergarten programs should prepare young children for elementary grades, the sustainability of high achievement in reading and math beyond pre-kindergarten is questionable.

### **Implications for School Leaders**

It is imperative that district and school leaders evaluate the current pre-school system to determine the developmental appropriateness of the program. Too many pre-kindergarten programs have become entirely academic, and curriculum standards that were once reserved for first grade are now being forced down to pre-kindergarten. Play centers are now replaced by rote, direct teach, academics. Play is one of children's most valuable resources; more specifically, it is vital to their social, emotional, and cognitive growth. Through play, children make sense of the world around them and work through new experiences, idea, and feelings (Pellegrini et al., 2002). Play can lead to development of problem-solving skills, creativity, divergent thinking, and language acquisition (Tsao, 2002).

Children must be allowed the opportunity to manipulate materials through authentic play. Through such experiences, children build a foundation of understanding concepts and skills we want them to learn. When children construct their own knowledge and ideas through play and hands on activities that make sense to them, their knowledge builds in a solid and unshakeable way (Carlsson-Paige, 2008). Research shows that children who engage in complex forms of socio-dramatic play have greater language and social skills, more empathy, and more imagination when compared to non-players. Children who participate in this type of play show more self-control and higher levels of thinking (Miller & Almon, 2009).

Play also has an impact on social and emotional learning. Writers in the field of social and emotional learning list many skills and competencies that are vital to success in school and

in life as a whole, such as the ability to manage distressing emotions, increased sensitivity to how others feel, impulse control, establishing positive relationships, and learning to resolve conflict. The social and emotional skills considered vital for success in school begin to build during the early years and, to a large extent, they develop through play. As children play, they learn about impulse control and are able to develop more self-regulatory social behavior (Carlsson-Paige, 2008).

Unfortunately, with the implementation of No Child Left Behind, increased pressures brought on by increased state accountability, and curriculum that is developmentally inappropriate, kindergarten has changed radically within the last two decades. Children spend more time being taught and tested on literacy and math skills than they do learning through play and exploration, exercising their bodies, and using their imaginations. Many kindergarten classes use highly prescriptive curricula geared to new state standards and linked to standardized tests. Current kindergarten standards are at the level of first grade standards from twenty years ago. Forcing children – particularly those identified as “at-risk” – to meet developmentally inappropriate standards has caused an increase in kindergarten retention, as students fall behind (Miller & Almon, 2009). Because of this pressure to meet inappropriate expectations and academic standards, children are being robbed of the benefits of play.

Through play, children also find purpose for literacy in their everyday lives. In a study conducted by Strickland and Morrow (1989), it was found that by providing literacy materials in a free-play environment, students found functional use for reading and writing. In short, these students were able to recognize the need to read and write. By simply placing books, pencils, markers, and paper in the dramatic play area, children showed an increase in literacy behavior (Strickland & Morrow, 1989).

The relationship between play, the classroom environment, and literacy learning has been studied and discussed for decades by seminal thinkers. Piaget (1962) stressed the importance of play in developing representational thought. He believed that, through play, children assimilate new information and consolidate it with past experiences. Vygotsky (1966) theorized that play allows a child to exceed the bounds of the immediate stimulus and thus to learn to use symbolic, abstract levels of thought. He believed that free play activities are valuable in promoting cognitive development generally and literacy development in particular. Pellegrini (1980) noted relationships between kindergarteners' levels of play and their emergence into reading, writing, and language. He found that symbolic play, which demands higher levels of cognitive involvement, predicted higher scores on standardized achievement tests (Morrow & Rand, 1991).

The research is clear. In particular, a faster-paced approach is not better when it comes to early education; that is, young children need play and hands-on interactions for genuine learning to occur. Education leaders must reverse this destructive trend and develop education policies that are grounded in research and theory in child development and early childhood education. School leaders must call for classrooms that are rich in childhood play with a focus on building literacy behaviors through playful classrooms.

In addition to revamping the entire pre-kindergarten program, district and school leaders must implement early childhood parental programs as well. Research shows that parental involvement in early education has long lasting positive effects. In a study of The Chicago Child-Parent Center (CPC) Preschool Program, it was found that early parental involvement increases long term success. This program offered half-day preschool for three- and four-year-olds, as well as full or part-day kindergarten for five-year-olds. Pupils' parents were required to be involved in the center at least one-half day per week. The overall program also provided a

wide variety of comprehensive services, which included attending to children's nutritional and health needs, coordinated adult services, funds for professional development and instructional supplies, and a focused emphasis on reading readiness through reduced class size, writing, and reading activities within the center. According to Reynolds et al. (2011), by the age of 26 years, participants of this particular program exhibited:

- Significantly higher rates of high school completion (79.7% vs. 72.9%);
- Significantly lower rates of felony arrests (13.3% vs. 17.8%);
- More years of completed education; and
- Higher rates of health insurance coverage (76.7% vs. 66.6%); and lower rates of depression symptoms.

Early care and education programs that incorporate parent involvement in education have positive effects on young children's cognitive and social development, and these effects can be substantial. Studies show not only immediate gains, but lasting benefits for learning and educational achievement, school progress and educational attainment, and social behavior (including delinquency and crime).

If they are to best serve children and foster the full potential of our children, school leaders must begin a thorough process of reassessing our pre-kindergarten and kindergarten practices. School leaders must also call on policy-makers, educators, health professionals, researchers, and parents to take action as follows:

1. Restore child-initiated play and experiential learning with the active support of teachers.
2. Reassess pre-kindergarten and kindergarten standards to ensure that they promote developmentally appropriate practices, and eliminate those that do not.

3. End the inappropriate use of kindergarten standardized tests.
4. Expand the early childhood research agenda to examine the long term impact of current practices on the development of children from diverse backgrounds.
5. Provide teachers with professional development that emphasizes child development and the importance of play.
6. Provide state funding for full day pre-kindergarten programs for all economically disadvantaged children.

### **Recommendations for Future Study**

The scope of this study is limited to one district that only offers half day pre-kindergarten programs. The findings of this study lead to additional questions as to why the students who attended pre-kindergarten did not have a significant overall advantage when entering kindergarten and no advantage by third grade. The implications of this study for further research include the following recommendations:

1. Further research should be conducted to compare student achievement and kindergarten readiness for students who attended full day pre-kindergarten versus those who attended a half-day program.
2. Further research should be conducted to examine student achievement when comparing pre-school programs that are grounded in play theory vs. those that are academic based.
3. Further research should be conducted to determine the reasons why children who are eligible for pre-kindergarten programs do not attend.
4. Further research should be conducted to compare student achievement in districts that have a comprehensive early childhood program that includes parental involvement as a



requirement for the program, versus those who have no early childhood program or one with no required parent component.

5. Further research should be conducted to determine why low income African-American students are not being successful despite attending a pre-kindergarten program.
6. Further research should be conducted to determine why boys are not succeeding at the same rate as girls despite attending pre-kindergarten.

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APPENDIX A  
IRB APPROVAL LETTER

# UNIVERSITY of HOUSTON

## DIVISION OF RESEARCH

October 23, 2012

Ms. Serena Pierson  
c/o Dr. Steven Busch  
Dean, Education

Dear Ms. Serena Pierson,

Based upon your request for exempt status, an administrative review of your research proposal entitled "IMPACT OF PRE-KINDERGARTEN EDUCATION ON ELEMENTARY STUDENT ACHIEVEMENT; IMPLICATIONS FOR SCHOOL LEADERS" was conducted on September 26, 2012.

At that time, your request for exemption under Category 4 was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. \* Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Alicia Vargas at (713) 743-9215.

Sincerely yours,



Kirstin Rochford, MPH, CIP, CPIA  
Director, Research Compliance

\*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **July 1, 2017**. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 13040-EX

APPENDIX B

SPRING INDEPENDENT SCHOOL DISTRICT APPROVAL LETTER



## Spring Independent School District

[www.springisd.org](http://www.springisd.org)

Reaching For The Stars

16717 Ella Blvd. • Houston, Texas 77090 • Tel. 281-891-6187 • Fax 281-891-6364

Allison Matney, Executive Director,  
Systems Accountability

February 16, 2012

Serena Pierson  
1007 N. Commons View  
Huffman, Texas 77336

RE: Research to determine if a difference in academic achievement existed in kindergarten and third grade between eligible prekindergarten students who had attended a Spring Independent School District prekindergarten program and those who did not attend.

Ms. Pierson,  
The Spring ISD Research Committee has approved your request to conduct the aforementioned research.

Sincerely,

Allison Matney

AM/ct

APPENDIX C  
KINDERGARDEN SOCIAL SCREENER

Social Screener  
Texas School Readiness Certification System  
State Center for Early Childhood Development –  
University of Texas–Houston

Child Name \_\_\_\_\_

[illegible]

Teacher Last Name

[illegible]

School Name

[illegible]

District Name

[illegible]

SSN

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PEIMS

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When completing the social screener please think about the child as best you can in terms of how she or he entered kindergarten. Please use any recorded information you may have from the first few weeks of kindergarten such as report cards, portfolios, and student records to help you.

This behavior occurs:	Never	Sometimes	Often	Always		
1) Negotiates solutions to conflicts with other children	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
2) Takes other children and their point of view into account	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
3) Cooperates with other children in group activities	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
4) Comforts or assists another child in difficulty	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
5) Takes care of toys	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
6) Attentive toward younger children	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
7) Works easily in a group	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
8) Helps with every day tasks (e.g., distributes snacks)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
9) Accepts compromises when reasons are given	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
10) Takes pleasure in own accomplishments	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

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