



THE EFFECT OF A PRE-KINDERGARTEN EARLY INTERVENTION  
PROGRAM ON THE ACADEMIC ACHIEVEMENT OF THIRD-GRADE  
HISPANIC ENGLISH LANGUAGE LEARNERS

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

by

Matilda Orozco

May, 2012

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THE EFFECT OF A PRE-KINDERGARTEN EARLY INTERVENTION  
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Orozco, Matilda. "The Effect of a Pre-kindergarten Early Intervention Program on the Academic Achievement of third-grade Hispanic English Language Learners"  
Unpublished Doctor of Education Doctoral Thesis, University of Houston, May, 2012.

### **ABSTRACT**

The focus of education policy and reform regarding English Language Learners (ELL) in the State of Texas and the rest of the nation tends to be more on late elementary to high school and that time period's impact. There has been much less study on the degree of long-term influence of pre-kindergarten programs on ELL student populations with respect to their English language and literacy needs. The purpose of the study was to determine whether ELL students who have attended Pre-kindergarten programs achieve academic success in their native language and English by the critical third- grade year. Data was collected from low socio-economic, Hispanic, ELL students in Texas who attended Pre-kindergarten with control data taken from students who did not. The research data includes information from students' third grade Texas Assessment of Knowledge and Skills (TAKS) test scores in English and Spanish, retention rates, discipline, TELPAS data, special education data, gifted and talented data and attendance rates. Existing research, along with this study, indicates a positive correlation when ELL students are exposed to a Pre-kindergarten program.

In twenty-first century America, all possible pathways to ensure students are prepared for college and career readiness are improved by a strong foundation of skills in the early years of schooling. This foundation-building is even more important for low socio-economic, Hispanic ELL students to critically develop as they enter kindergarten.

This study will conclude that a continued, robust, Pre-kindergarten program for English Language Learners is essential to meet the needs of the fastest growing segment of the population and set the foundation to meet the goals of college and career readiness.

## **ACKNOWLEDGEMENTS**

I want to thank the Lord Jesus Christ for giving me the strength, patience, and wisdom I needed daily to accomplish this goal. I want to thank my mother, who has been an inspiration in my life and has completely supported me throughout these years. My mother is my reason for completing this project, she motivated me to continue my studies. I also want to thank my sister Nancy, who has been great support and has challenged me to continue the learning. I could not have done this without you, having you as my sister has made it easy. Thank you again for all that you do for me.

I want to thank my friends and my colleagues; you were great support, I also want to thank my cohort, it was a great opportunity to work with all of you and the memories we created in China are long lasting memories I will never forget. Our HISD cohort, Steve, Lupita, Javier, Alvin, Julie, Debbie, and Faviola, it was great to collaborate with you and Javier thank you for your company and late nights.

The professors at the University of Houston thank you for your understanding and willingness to work with our schedules, without your support I would not of accomplished this goal. One great memory I will always have dear in my heart is attending the educational conference in China, great learning experience. A special thanks to my chair, Dr. Angus MacNeil, thank you for your guidance it was great learning from you, my doctoral committee, and Dr. Salazar-Zamora for being part of this great journey.

Finally, I want to dedicate this to my son Ryan. He is my reason and motivation to complete what I started. It is never too late to accomplish your goal. You can do anything you set your mind to do. Thank you for giving me this opportunity.



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## CHAPTER ONE

### INTRODUCTION

#### **Background of the Study**

In contemporary society, it has become necessary to continue to reform educational programs to best meet the needs of all students. This is especially critical with regard to the fastest growing segment of society – Hispanics (U.S. Census Bureau, 2010). The focus of educational reform has been to prepare all students to be college- and career ready as outlined by the Federal No Child Left Behind Law and on-going initiatives flowing from the state legislature. Unfortunately, the current, grim, economic outlook has forced both federal and state governments to adjust funding while leaving educational mandates in place. Elected officials seem to look for outcomes without paying attention to the details of how to get there.

As budget cuts loom, it is left to school districts and individual campuses to tighten their belts in ways that best support their students, addressing unfunded mandates while paying attention to those “forgotten details.” In this climate of economic constraints, it is hoped that governments and districts would not cut pre-kindergarten programs, but instead promote them because research shows how crucially necessary preschool programs are to the success of children in their future years of schooling.

The fastest growing groups of students in Texas are Hispanic English Language Learners. They already represent a significant percentage of the students in our urban public school populations (Texas Education Agency, 2011). Many of these students also have their limited language proficiency compounded by living in an environment of

poverty or near-poverty. In this environment, they are less likely to receive the preschool preparation that other children are afforded. Pre-kindergarten programs were originally developed with the purpose of exposing children with these specific needs to the routines and structures their environment may not afford them, as well as promoting/exposing them to much-needed social and oral language development.

Longitudinal research shows that students who attended preschool generally benefit later in their educational career with lower retention rates, higher attendance rates, and lower dropout rates than their peers who did not attend preschool (Barnett 1995). Sturrock (2005) suggests that students who attend pre-kindergarten programs are more likely to graduate high school and have a better chance at becoming productive members of society. As federal and state lawmakers are creating policies and deciding budgets, they must take into consideration if it is wise to cut early childhood programs or continue to fund and even expand them. This research will conclude that continued, robust, pre-kindergarten programs for English Language Learners are essential to meet the needs of the fastest growing segment of the population and set the foundation to meet the goals of college and career readiness. Should the government decide to cut pre-kindergarten programs, the result will be a poorer nation.

### **Statement of Problem**

The performance data on the effectiveness of pre-kindergarten programs in the United States is wanting. The last, major, national, data collection by the National Center for Education Statistics (NCES) in its seminal report, *Digest of Education: 2010*, gave a great amount of data on the general nature of pre-kindergarten but failed to address, in a

significant way, the role of the programs in long-term student success (2010). It also failed to give data that addressed specifically the impact of pre-kindergarten programs on English Language Learner success. It is essential to process through the data that is now available and to continue research in order to give better clarity to the specific needs of this student group.

Additional research highlighting pre-kindergarten programs for English Language Learners will (a) help provide opportunities for all students in this demographic to attend a quality pre-kindergarten program, (b) align components of high quality pre-kindergarten program with the Texas Pre-kindergarten Guidelines, the Texas Essential Knowledge and Skills (TEKS), and the new State of Texas Assessment of Academic Readiness (STAAR) exams in order to impact future student success, (c) improve the understanding of leaders and stakeholders for the development of policy for maintaining and improving pre-kindergarten programs, (d) addressing the needs of the fastest, growing segment of the pre-kindergarten population in Texas, Hispanics, and (e) disseminating information to decision-makers in Texas school districts and state government in reference to the importance of all students having the opportunity to attend a quality, Texas, pre-kindergarten program.

### **Purpose of the Study**

The purpose of this study is to determine whether Hispanic ELL students who have attended pre-kindergarten programs achieve significant academic benefits in their native language, as well as English, by their critical third year. Hispanic students now make up the largest and fastest segment of elementary school students in Texas (Texas



Education Agency, 2011). Large portions of these students are also English Language Learners (ELL) and they also tend to fall into the low socio-economic section of the demographic. With the continued push for accountability and subsequent data driven decision making with regard to “Best Practice Programming,” it is important for this study to determine whether Hispanic ELL students in Texas benefit from attending pre-kindergarten programs.

In 2001, Texas developed the high-stakes assessment system known as the Texas Assessment of Knowledge and Skills (TAKS) test. Beginning in the 2002-2003 school year, TAKS required a level of achievement at three grade levels, third and eighth as a promotion standard and eleventh grade as a graduation standard (TEA, 2011). In the 2012-2013 school year, a new assessment, STAAR, will replace TAKS; however, a continuation of promotion and graduation standards will exist. This new assessment will require greater rigor in regard to student performance. In light of these high standards, it is essential that educators and decision makers understand the importance of early intervention for students that are at-risk for failure in schools. The purpose of this study, therefore, was to determine if the intervention of an effective pre-kindergarten program for preschool, Hispanic ELL students positively impacted third grade academic achievement as measured by TAKS, TELPAS, retention rates, special education, gifted and talented and attendance rates. To determine this impact, the performance of third-grade, Hispanic ELL students who attended pre-kindergarten in a large, urban, school district in Houston, Texas, was compared to students in the same schools who did not attend pre-kindergarten.

## **Contextual Background and Significance of the Study**

We are in an educational crisis. With the imposing of No Child Left Behind standards, the public school system has gone from little to no accountability to an extremely high level of accountability. With the budget crises and shortages of funds, it has become necessary to cut certain programs. The focus of this dissertation is to look at the research that supports the need for pre-kindergarten programs. Early Childhood Programs being cut would impact English Language Learners the most because they are at the most disadvantage in language and reading. We need to educate parents, especially parents of English Language Learners, on the importance of sending their children to pre-kindergarten and the significant impact.

In times of economic crisis, it is the expected path to tighten the proverbial purse-strings and consider what is needed most to survive. In turn, decisions are made to “do without” certain, less important things. The “importance” of a pre-kindergarten education is called into question as our nation’s public school systems face significant budget cuts. With the influx of immigrants and the rise in the Hispanic population, English Language Learners constitute a growing percentage of students in our urban school districts; it is this group of students who will suffer the greatest impact from the loss of a quality, early childhood, educational experience.

## **Research Questions**

Further clarification of the problem is achieved by considering the following research questions:

1. What percentage of ELL students eligible for pre-kindergarten are actually enrolled in pre-kindergarten programs?
2. Were there any notable trends which distinguished those ELL students who participated in Pre-kindergarten and those who did not?
3. Did Pre-kindergarten participation have an increase on the number of students qualifying for gifted and talented?
4. Did Pre-kindergarten participation have an increase on student achievement as measure by the Spanish and English-language TAKS tests?
5. Did Pre-kindergarten participation have an increase on school attendance, disciplinary incidents, special education referrals or retentions?
6. Did Pre-kindergarten participation have an increase on student achievement as measured by the TELPAS test?

### **Definitions of Terms**

Findings of this study are to be reviewed within the context of the following definitions of operational terminology:

- Academic Excellence Indicator System (AEIS): The AEIS is a report released by the Texas Education Agency (TEA) in the fall of each school year. It contains information submitted by school districts through the Texas Public Education Information Management System during the previous year. The information contained in the AEIS relevant to this study are the achievement scores of

students on the Texas Assessment of Knowledge and Skills (TAKS) by grade level, gender, socio-economic status, and Limited English Proficiency.

- Chancery: Is the term used to describe the district's web based student information system designed to store and maintain student information.
- English Language Learner (ELL): Is a term used to describe a student whose native language is other than English and has not met the criteria for being classified as English proficient. This term is often used in the literature in lieu of Limited English Proficient. For the purposes of this study, English Language Learner has been used.
- Gifted and Talented (GT): The term gifted and talented means a child or youth who performs at or shows the potential for performing at a remarkably high level of accomplishment when compared to others of the same age, experience, or environment and who exhibits high performance capability in an intellectual, creative, or artistic area; possesses an unusual capacity for leadership; or excels in a specific academic field.
- Hispanic or Latino: is a term used to describe persons who trace their origin or descent to Mexico, Puerto Rico, Cuba, Spanish speaking Central and South American countries, and other Spanish cultures.
- Limited English Proficient (LEP): LEP is a term used to describe a student whose native or dominant language is other than English and who has yet to meet the criteria for being classified as English proficient. While the term English

Language Learner was often used in the literature in lieu of Limited English Proficient, TEA continues to use the latter. For the purposes of this study, English Language Learner has been used.

- Low Socioeconomic Status (low SES): is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position relative to others, based on income, education, and occupation. When analyzing a family's SES, the household income, earners' education, and occupation are examined, as well as combined income, versus with an individual, when their own attributes are assessed. For the purposes of this study, student's with low SES are defined as meeting the requirements of the National School Lunch and Child Nutrition Program for either free or reduced lunch.
- No Child Left Behind (NCLB): Is an act passed by congress in 2001. The Act requires states to develop assessments in basic skills to be given to all students including special education students and students from disadvantaged backgrounds. The law is written to require 100% of the students to reach the same set of state standards in math and reading by 2014.
- Public Education Information Management System (PEIMS): PEIMS is a state-wide data management tool for public education information in the State of Texas. Information such as district organization, finance, staff, and student demographic data can be accessed from this database.

- **Pre-kindergarten Students:** in Texas a Pre-kindergarten student is no more than age four by September 1 and defined by their eligibility based upon the following criteria: (1) is unable to speak and comprehend the English language; or (2) is educationally disadvantaged; or (3) 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 (4) 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 (5) 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 (6) 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.
- **Second Language Acquisition:** This term refers to students who are learning a second language in addition to their native language. These students have been identified as second language learners after completing a home language survey and being assessed using a language proficiency test. These students receive instruction in their native language and in the second language.
- **Socio-Economic Status (SES):** This term identifies the current level of income to determine eligibility for free, reduced or full price meals under the National

School Lunch and Child Nutrition Program and other public assistance. This status is determined by providing income documentation.

- **Special Education:** Special education is a term used by the federal law to describe specially designed instruction that meets the unique needs of a child who has a disability. These services are provided by the public school system and are free of charge. They can include mental, physical, behavioral and emotional disabilities
- **State of Texas Assessments of Academic Readiness (STAAR):** This term refers to the criterion referenced test that will replace the TAKS test in Texas. Students will test in grades 3–8. At high school grade-specific assessments will be replaced with 12 end-of-course (EOC) assessments: Algebra I, geometry, Algebra II, biology, chemistry, physics, English I, English II, English III, world geography, world history, and U.S. history beginning in the Spring 2012.
- **Texas English Language Proficiency Assessment System (TELPAS):** This term refers to the assessment that evaluates the progress that limited English proficient (LEP) students make in learning the English language.
- **Texas Assessment of Knowledge and Skills (TAKS):** This term refers to the criterion-referenced test administered to students in grades 3-11 from 2000-2011 in Texas. It assessed students in the areas of reading, language arts, math, writing, science, and social studies. It provided data necessary for student promotion at grades three and eight and exit level at grade eleven. For the purposes of this study the grade three reading test is of greatest import.

- Title I: This term set by the federal government provides financial assistance to the state agency's to meet the needs of educationally at-risk students. The funds are to supplement additional instructional services and activities.

### **Organization of the Study**

The study is organized in five chapters. Chapter 1 presents the Introduction to the study which includes the following: (a) Statement of the Problem, (b) Purpose of the Study, (c) Significance of the Study, (d) Research Questions, (e) Assumptions and Limitations of the Study, and (f) Definitions of Key Terms.

Chapter Two presents the Review of Literature; Chapter Three will discuss the methodology of the research. Chapter Four will present the findings. Conclusions, Implications, Areas for Future Research, Limitations and Summary will be presented in Chapter Five.

### **Assumptions**

The findings of this study have been preceded by the following assumptions:

- The researcher was impartial and objective in the analysis of the data.
- The methodology proposed and described offers the most logical and appropriate design for this particular research project.
- The interpretation of the data accurately reflects that or which it was intended.

### **Limitations of the Study**

The findings of this study were limited by the following:



- The scope of the study was limited to the information and data acquired from the literature review, TAKS results, and other relevant data.
- The findings of this study may not be generalized to any other group other than the selected public elementary schools in Houston, Texas.

## CHAPTER TWO

### REVIEW OF LITERATURE

Learning experiences of the preschool years provide a foundation that guide children academically, socially, and emotionally. High-quality pre-kindergarten programs are essential to all students. The growth in public, preschool education is based on research that shows high-quality pre-kindergarten has a positive effect on children's chances of succeeding in school and life (Ainsworth & Laosa, 2007). Studies also show that high-quality pre-kindergarten increases a child's chances of success in kindergarten and in life (Barnett 1995; Andrews & Slate, 2001; Currie & Thomas, 2000; Neuman, 2003).

This chapter presents a review of literature as it pertains to the impact of pre-kindergarten programs on Hispanic English Language Learners. The literature will be reviewed in the following areas: (a) history of early childhood programs; (b) Pre-kindergarten program in Texas; (c) Pre-kindergarten Hispanic students; (d) Hispanic English Language Learners; (e) Addressing the language issue; (f) The benefits of Pre-kindergarten programs; (g) The Perry Preschool Study; (h) The Carolina Abecedarian Study; (i) The Chicago parent child center; (j) Oklahoma's universal preschool program on Hispanic children; (k) Quality Pre-kindergarten programs; (l) Communication; (m) Summary of the review of literature.

In an age of increased accountability, educators and policymakers know the benefits of early childhood programs and the return they have on the economy. Pre-kindergarten classrooms today are filled with children who bring a variety of unique

experiences – socioeconomic backgrounds, cultures, and languages other than English (Jones, 2001). As we continue to educate all children, one must continue to ensure all have equal access to educational opportunities. Through high quality, early childhood programs, there are many benefits for all linguistically- and culturally-diverse students to have an opportunity to close the achievement gap before it starts to widen.

### **History of Early Childhood Programs**

Historically, young children in America have always been provided opportunities to participate in educational programs (Spring, 1994). During the colonial era, if schools were available, families sent their youngest children to school (Spodek, 1988). The Puritans believed children should learn to read the Bible as soon as possible; therefore, children were taught to read when they were three or four years of age (Andrews & Slate, 2001). With the influence of the European culture, Spring (1994) also noted that American schools began early childhood education in the late 19th century. Over the years, many schools across the country established public and private schools offering many young children an opportunity to learn. Soon after the turn of the century, primary schools – currently known as public schools – established instructional standards for reading, writing, and mathematics. Dewey (1956) noted that many children attending the schools started to read and write at age three or four and began instruction at age five or six.

In 1828, The Boston Infant School opened in Boston, Massachusetts; it was considered the country's first day care center where children between the ages of 18 months and four years of age had an opportunity to learn (Andrews & Slate, 2001). The

purpose of the Boston Infant School was to enable mothers to work and provide more of a school setting for the children other than being at home. The school was created to follow the same model as many schools in England. The model duplicated infant schools in Scotland that were developed by Robert Owen, a Welsh educator (Spodek & Saracho, 1994). Infant schools established in Scotland were for children 2 to 6 years of age whose mothers worked in factories. While the mothers were working, children received moral and literary instruction (Spodek & Saracho, 1994).

In 1854, nurseries arrived in New York where they were established for children of the poor (Andrews & Slate, 2001). In addition to providing learning opportunities for children, they provided resources for the parents such as employment, hygiene, and parenting skills. According to Andrews & Slate (2001), the schools continued to grow and full expansion flourished in the 1880s and 1890s when many European immigrants were arriving in American. By 1898, 175 nurseries were in existence (Spodek & Saracho, 1994). Consequently, you currently find nursery schools across the United States providing early childhood learning opportunities to children way before they enter a traditional school program.

In 1860, a philosopher and educator named Fredrick Froebel created the first kindergarten program (Nichols, 2008). According to Irene Lilley (1967), Froebel's foundational approach allows the child to be led by his or her own interests and to freely explore them. The teacher's role, therefore, is to guide rather than lecture. Nichols (2008) suggests that Froebel designed a program to meet each child's need for physical activity; and, more specifically, the development of sensory awareness and physical dexterity. In

addition, Nichols (2008) also noted that these program considerations should also account for various more abstract concepts, such as development of creative expression, the exploration of ideas and concepts, the pleasure of singing, the experience of living among others, and the overall satisfaction of the soul.

Froebel's instructional program also featured games, play, songs, stories, and crafts to stimulate imagination and develop physical and motor skills (Nichols, 2008). Much like current early childhood programs, the materials in the room were divided into two categories, the first being objects that were fixed in form such as blocks. The purpose was that in playing with the object, the child would learn the underlying concept represented by the object. The second category was by occupations which allowed more freedom and consisted of things that children could shape and manipulate such as clay, sand, beads, and string. There was an underlying symbolic meaning in all that was done (Nichols, 2008). Froebel's thinking influenced Germany and shortly it traveled to the United States.

As Froebel's programs integrated into American mainstream culture, his way of thinking influenced many early childhood education programs. More specifically, Froebel demonstrated a belief that kindergarten programs should include activities for self-development and socialization. In contemporary society, numerous programs continue to practice his philosophical viewpoints on early childhood programs. Over the years, many early childhood programs have continued to grow in numbers within the United States. However, many kindergarten programs are very much like they were when they first started.

Nurseries continued to grow and expand throughout the United States. In the 1960s, the federal government got involved with the Economic Opportunity Act (EOA) of 1964 and the Elementary and Secondary Education Act of 1965 which were part of President Lyndon B. Johnson's War on Poverty. The acts were created to bridge the gap between poverty and middle class and to provide individuals with opportunities for training and work (Andrews & Slate, 2001). Shortly after this was created so was the passing of special education legislation that included early childhood education. In 1986, the passage of Public School Law 99-457, a mandate for free and appropriate public education for preschool children ages three to five with disabilities increased the number of students attending pre-kindergarten (Andrews & Slate, 2001).

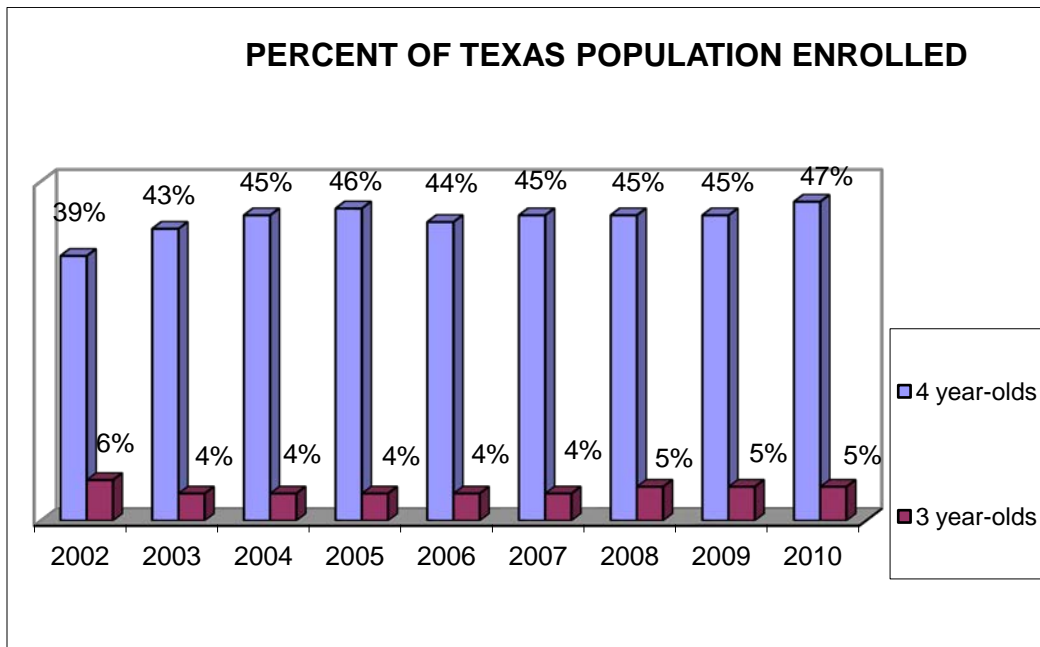
As the government continued its focus on early preschool many programs were created to assist the growing number of low-income families. States were investing in early education in the interest of helping preschool children succeed in school. Many programs such as Head Start began to create major changes in the early childhood programs. Head Start is an American preschool program for poor three- and four-year-old children. The program began in the 1960s as part of President Johnson's "War on Poverty." The goal of the program is to ensure poor children close the gap by the time they reach kindergarten. Head start provides services such as meals, medical services and parent trainings. Head Start services are designed to be responsive to each child's ethnic, cultural and linguistic heritage (Ainsworth & Laosa, 2007).

As the growing need for effective early childhood programs continues to grow, many states continue to offer programs such as private pre-kindergarten, public

kindergarten, half-day, full-day, and tuition-based programs. Other approaches found in some states include grant-based programs such as Head Start and Even Start. In addition, several states take advantage of the Race to the Top grant to provide an additional focus on effective early childhood programs. Regardless of which program states offer, pre-kindergarten programs are needed for all children.

### **Pre-Kindergarten Programs in Texas**

Across the United States, many educators see the benefits of early childhood and are making efforts to create programs. In 1984, with the passage of House Bill 72, Texas became one of the few states that offered a pre-kindergarten program (Texas Education Agency, 2011). For instance, Texas continues to emphasize the greater need for pre-kindergarten programs for our children. As a result of this, the number of enrolled Texas pre-kindergarten students increased from 200,529 to 214,694 in one year see figure 1. (Texas Education Agency, 2011) . In Texas, the term Pre-kindergarten is associated with enrollment in a structured learning center – for one or two years – that is associated with a K-12 school system. Knowing that pre-kindergarten programs were designed to help raise awareness during the preschool years and to develop the skills they need to be successful, much of the emphasis within these programs are language development, mathematics, social skills, and cognitive skills.



*Figure 1.* Percent of Texas population enrolled. This figure illustrates the state Texas percentages for four- and three-year-olds enrolled in pre-kindergarten programs.

Texas, like many states, funnels its public dollars to half-day or full day pre-kindergarten programs. Public school pre-kindergarten programs are reserved for three-year-olds and/or four-year-olds who meet specific eligibility criteria. In addition, children who meet eligibility guidelines for at-risk children have an opportunity to participate in pre-kindergarten programs. In order to participate in pre-kindergarten programs, Texas families must meet at least one of the following criteria:

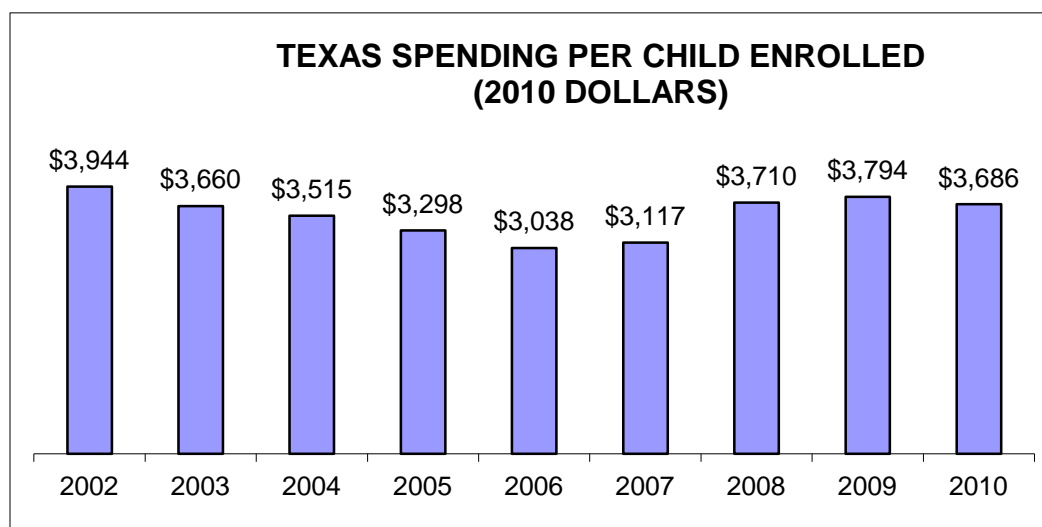
- Be unable to speak or comprehend English
- Be educationally disadvantaged (eligible to participate in the national free or reduced-price lunch program)
- Be homeless
- Be in active service in the military / military duty



- Be or have been in foster care

Furthermore, pre-kindergarten programs may charge parents who do not meet the qualifications. In regards to programming, many Texas school districts have not established a student-to-teacher ratio for pre-kindergarten children; however, the state recommends a student-to-teacher ratio of 22:1.

Over the years, the legislature has added many expansions that allow for exceptional programming. Texas currently has 763 districts offering pre-kindergarten programs and more than 214,000 students enrolled during the 2009-2010 school year (Texas Education Agency, 2011). State funding is delivered through the Foundation School Program that is calculated and distributed on the basis of the district level average attendance. According to the Texas Education Agency, the ADA averaged \$3,686 per eligible student totaling an estimated \$702.5 million see figure 2 (2011).



*Figure 2.* Texas spending per child enrolled. This figure illustrates the Average Daily Attendance per pupil spending on pre-kindergarten programs from 2002-2010 in Texas.

In addition to state funding, school districts may also draw from many different sources to be able to provide additional funding sources such as title funds. These funds allow schools to offer a full day program or programs to three-year-olds. Moreover, some Texas schools partner with local Head Start programs providing more opportunities for Texas children to experience effective programming.

As part of the quality standards recommended by the National Institute of Early Education Research, Texas ensures that these standards are implemented in their pre-kindergarten programs. For example, teachers must hold a bachelor's degree and certification in the area of early childhood education (Texas Education Agency, 2011). In an effort to support teachers and ensure the implementation of rigorous, yet developmentally appropriate programs, Texas established the Pre-kindergarten Guidelines – a set of essential knowledge and skills that outline the instructional expectations within pre-kindergarten programs (Texas Education Agency, 2011). These guidelines focus on five domains such as social emotional development, language, communication, emergent literacy, writing, and mathematics. The purpose for having the guidelines was to ensure that everyone in Texas followed and understood the specific outcomes that are required in Texas pre-kindergarten classrooms.

In an effort to measure the effects of pre-kindergarten programs, all participating students will be assessed at the beginning, middle, and end of the school year. This data will drive instructional decisions and help identify if interventions are necessary. This data also provides parents with an idea of how their children are progressing towards entrance into kindergarten programs.

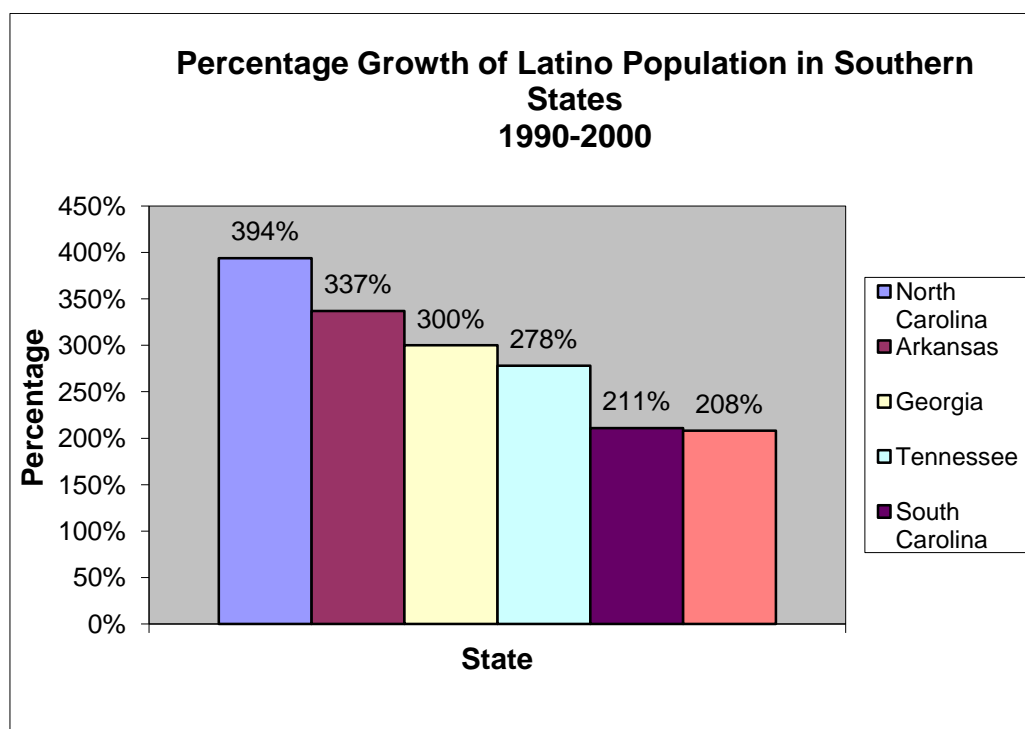
### **Pre-Kindergarten Hispanic Students**

Hispanics are now the largest minority segment of the national population, and the proportion of Hispanics among the nation's children is expected to grow rapidly (Hernandez & Jacobson, 2008). As members of the largest group of minorities in the United States, Hispanic children face many educational deficits (Gormley, 2008). More specifically, language tends to be a significant deficit, especially for children who speak Spanish as their primary language; for these children, school becomes a challenge (Gormley, 2008). Due to language barriers, Ainsworth and Laosa (2007) noted that Hispanic children are less likely to enroll in pre-kindergarten programs; therefore, Hispanics are less likely to begin school with the readiness skills needed for reading, writing and math. Due to the lack of high quality, affordable programs in Hispanic communities, Hispanics attend preschool and early learning programs in much lower proportions than do Whites and African Americans (Ainsworth and Laosa, 2007). This is exacerbated by program schedules that often do not meet the needs of working parents. Programs that are more suitable to the needs of English learners and of high quality will result in greater Latino participation (August & Shanahan, 2006).

The educational outcomes of Hispanic students in U.S. schools lag, on average, well behind those of non-Hispanic Whites and Asians, and in some cases, behind those of non-Hispanic Black students as well (Fry, 2003, National Center for Education Statistics, 2003). For example, Hispanic children have lower levels of school readiness at the start of kindergarten than White and Black children (Fry, 2003). High school completion rates for Hispanic students are substantially lower than either White or Black students (Vernez,

Georges, and Lee Mizell, 2002). Likewise, Hispanic students are less likely than White students to attend and graduate from college (Vernez, Georges, and Lee Mizell, 2002), and more likely to be enrolled in two-year colleges than four-year colleges (Pew Hispanic Center, 2004).

Hispanic students in early childhood education make up the largest and most rapid growing group (Garcia & Gonzales, 2006). In the United States, Hispanics continue to underperform their grade-equivalent peers from other racial groups. From this research, it is evident that many Hispanic children enter school well behind their non-Hispanic counterparts, achieve at lower levels throughout school, and graduate at lower rates (Ainsworth & Laosa, 2007). Furthermore, Hispanic children under five-years-old constituted over 4 million or 21% of the US population in this age (Buenafe, 2011). The largest percentage increases in the Hispanic population during the last ten years have occurred in the South (North Carolina, 394 percent; Arkansas, 337 percent; Georgia, 300 percent; Tennessee, 278 percent; South Carolina, 211 percent; and Alabama, 208 percent (see Figure 3) (Buenafe, 2011).



*Figure 3.* Percentage growth of Latino population in southern states (1990-2000). This figure illustrates the Latino population in North Carolina, Arkansas, Georgia, and South Carolina from 1990-2000.

However, as the population distribution increases, we will continue to see Hispanics moving all over the country to the Midwest and Southeastern states.

Many Hispanic families live in poverty with parents who have not had any type of formal education (Garcia & Gonzales, 2006). The challenges of living in poverty make it more difficult for many families to attend quality pre-kindergarten programs. According to Denton & West (2002), a federally funded study showed that Hispanic children enter kindergarten well behind their non-Hispanic peers. Additionally, a study conducted by the U.S. Department of Education, 75 percent of White children could recognize letters in the fall of their kindergarten year while only about half of Hispanic children could do so

(Denton & West, 2002). These patterns of disparities occurred in other measures as well, including math skills. While Hispanic children made substantial progress in reading and math by the end of first grade, they continued to lag in acquiring skills considered essential to early reading and math development (Ainsworth & Laosa, 2007). Therefore, more Hispanic students are more likely to be behind in school and most likely to experience home language disparities.

On the contrary, children who do attend pre-kindergarten programs are more likely to have a more positive impact on school (Ainsworth and Laosa, 2007). Effective pre-kindergarten programs provide children from poverty an opportunity to be exposed to early learning. However, families face several challenges such as financial, linguistic, and educational barriers to enrolling their children. These barriers might even cause immigrant families to be less likely to attend preschool programs. Due to funding from the federal government, Denton and West (2002) followed a national sample of children from the start of kindergarten through the fifth grade. From this research, they observed that Hispanic students entered kindergarten with less competence than Whites in foundational mathematics and reading knowledge and skills. Denton and West (2002) also found that at age five, even English-proficient Latino children are typically about three months behind white children in their pre-reading skills. In the fourth grade, Latino children are still scoring lower than White children in reading. Research suggests that states should expand and offer pre-kindergarten programs to Hispanic families so that children have more opportunities to attend pre-kindergarten programs (Hernandez & Jacobson, 2008).

Hispanic children who have an opportunity to attend effective, pre-kindergarten programs have an opportunity to enhance their chance for future development by learning language, social and practical skills in preschool settings (Ainsworth and Laosa, 2007). For many of the poor, Hispanic children, preschool helps offset the social, emotional, physical, and cognitive challenges. It also helps those who speak little or no English and gives them an opportunity to continue their bilingual education (Garcia & Gonzales, 2006).

### **Hispanic English Language Learners**

According to the United States Census (2010), there were 50.5 million Hispanics in the United States, which composed 16 percent of the total population. The Hispanic population increased by 15.2 million between 2000 and 2010, accounting for over half of the 27.3 million increase in the total population of the United States (United States Census, 2010). From these statistics, one might identify that Hispanics are the fastest growing minority group in the United States.

The State of Texas experienced, for the first time, a shift from a minority to majority state with over 50 percent of the population belonging to a minority group – Hispanics. In a decade, Texas saw a growth from 48 percent of the minority population rise to a current holding of 55 percent (United States Census Bureau, 2010). In regards to how this growth impacts education in Texas, the number of students receiving bilingual or English as a Second Language instructional services increased by 56.5 percent over the same year, and the number of students identified as Limited English Proficient (LEP) grew by 47.1 percent (Texas Education Agency, 2011).

The fundamental principles underlying the No Child Left Behind (NCLB) Act of 2001 focus on high standards of learning and instruction with the goal of increasing academic achievement in reading and math in particular within all identified subgroups in the K-12 population. One of these subgroups is the growing population of English Language Learners (Flynn & Hill 2005, ). Consequently, NCLB has increased awareness of the academic needs and achievement of ELLs as schools, districts, and states are held accountable for teaching English and content knowledge to this special and heterogeneous group of learners (Flynn & Hill 2005).

According to United States Census Bureau (2010), English Language Learners are the fastest growing group among the school-aged population in this nation. In 1990, approximately 2 million public school students (or one of every 20 students) in grades K-12 were ELLs. Today, however, there are over 5 million ELLs, which constitute one in nine public school students in K-12. To highlight the significance of this demographic shift, the 150% increase of ELLs has occurred during a period when the overall school population has increased by only about 20% (Goldenberg, 2010).

As population growth continues to expand, the ELL population is estimated to reach numbers exceeding 9.9 million students. Such substantial increases in student demographics will only exacerbate the challenges already faced by educational systems across the nation, particularly with regard to ELL support, remediation and intervention. More specifically, if proper and necessary recourses are not provided, ELL students' language development will have potentially disastrous effects upon their cognitive and social development. It is important to note that bilingualism can be developed most



effectively during students' critical early years of education; moreover, children who enter kindergarten proficient in two languages have a much better trajectory (Garcia & Gonzales 2006).

Researchers have concluded that English Language Learners who attend primary school are more likely to have higher rates of literacy, which subsequently leads to higher academic achievement, higher graduation rates, and lower grade retention rates as a result (Barnett, 1995). In addition to this, research also indicates that children who are enrolled in a quality pre-kindergarten program have greater amounts of time invested in the language-learning process (Ainsworth and Laosa, 2007).

In Texas, the Pre-Kindergarten Limited English Proficiency (Pre-K LEP) program was created to address the educational needs of English language learners (ELLs) enrolled in preschool. According to the Texas Education Agency (TEA), the goal of this particular program is to implement successful multi-age programs serving pre-kindergarten children (i.e., three-, four-, and five-year olds) that prepare ELLs for success in school. As specified in the related Texas Education Agency statute, the Pre-K LEP program must provide opportunities for the acquisition of English while supporting a child's first language through the provision of social services, appropriate training and modeling, and research-based curricula and supplies to enhance the development of both languages. Furthermore, the statute mandates that instruction be provided in both languages so children can learn concepts in the language they understand while developing their English skills (Texas Education Agency, 2011). While many states like Texas offer a Pre-kindergarten program for English Language Learners, many Hispanics

fail to enroll their children.

It is critical for school districts to make an effort to enroll families in pre-kindergarten programs, such as Head Start programs. It is of critical importance that school districts and campuses recognize, and respond appropriately, to the fact that the Hispanic demographic is experiencing exponential growth. Hence, the growing numbers of ELLs, and the unique challenges they face, is directly proportional to the growth of the Hispanic demographic as a whole. It behooves individual states, therefore, to adopt both urgent and proactive measures.

Much research shows that the academic achievement gap for young Latino ELLs is especially challenging. According to Espinosa (2008), for example, ELLs can be subject to significant learning gaps beginning at Kindergarten, which then often persists throughout the remainder of their school years. In a large national study, low-income Hispanic children scored more than half a standard deviation below the national average in math and reading achievement at the point of kindergarten entry (Barnett, 2006).

Unfortunately, when compared to their English-speaking counterparts, the educational journey for many non-native, English-speaking students results in persistent achievement disparities related to substantially lower levels of academic achievement, high school completion, as well as college enrollment rates (Espinosa, 2008). Thus, providing these students with an early foundation in school-readiness skills is crucial to improving their educational experiences and reducing their risk of dropping out of school (Texas Education Agency, 2011). This need for quality, early childhood, educational intervention becomes more crucial when viewed with respect to recent demographic

trends. Hispanics, now the majority-minority student group in the state must proactively attain a wide range of educational services.

### **Addressing the Language Issue**

As the Hispanic population in the United States is growing at a rapid pace, language presents itself as a barrier to many Hispanic children who do not speak English. Children who are English language learners face the challenge of learning the content while learning the academic language needed to be successful. NCLB the federal governments education reform act focuses attention on closing the achievement gap between all sub- groups, including Hispanics. To ensure Hispanics are meeting the standards and mandates of NCLB, high quality Pre-Kindergarten is critical. According to the Supreme Court's 1974 decision of *Lau v. Nichols*, states are constitutionally obligated to provide non-English speaking students with an opportunity to participate in public education programs. This makes it difficult for policy makers and educators to address both the legal and educations requirements of English language learners (Ainsworth and Laosa, 2007).

The discussion of bilingualism or bilingual education can be misunderstanding and controversial too many. A review of research indicates that bilingual children often have higher levels of academic achievement. Further research has shown that bilingualism can be beneficial for children's' feelings of self worth (Patton 1997). According to Hakita (1986) school systems historically have encouraged English language abilities to the neglect of a child's home language. Proponents of the bilingual approach, in which children are taught in their home language, emphasize that linguistic,

cognitive and social development are interrelated and proceed simultaneously. Wong (1991) believes that children are faced with a language in the preschool classroom with which they are not yet conversant are more likely to fall behind or may lose their first language. Research has found that high quality bilingual preschool programs where teachers use the first language as a strategy for native language support promote development in both languages rather than impeding growth in the first language.

The goal of bilingual Pre-kindergarten programs is to help young children develop their first language skills as fully as possible, while also helping them learn English. States and school districts have adopted a variety of approaches to educate their English language learners pre-kindergarten children. In general there are different types of programs for English language learners: first language classrooms, bilingual classrooms, which include two way dual language and English language classrooms (Garcia, Gonzales, 2006).

August and Shanahan (2006) found that in one analysis of 11 studies comparing bilingual programs with English only programs, ELL children in elementary schools who attended two years of bilingual programs were found to perform at the 34th percentile. Other studies conducted found that teaching academic skills such as reading in the first language is more effective in the terms of second language achievement than simply immersing children in English (August, Shanahan 2006).

Research on early childhood programs indicate the value of native language. Many bilingual approaches have been developed as a means for the academic achievement of English language learners where bilingual teachers must be fluent in two

languages. This approach has been proven successful in many states. NIEER conducted a study where students who spoke Spanish and English made substantial gains. The study was randomized in which some children were assigned to a two way dual language bilingual program and the others attended an English immersion program. The students who received both languages and children in the immersion program both made strong gains on English language measure of achievement. The Two Way children made gains on Spanish language acquisition, while their peers lost ground on Spanish language age norms. The program also had Spanish support for ELL students, which was proven successful.

While there is much debate on bilingual programs for early childhood students, English only policies for preschool children lack the research. To the contrary research finds that there are advantages to other approaches. It is important that strong research on language of instruction be undertaken at the preschool level since much of what we know is based on research practices. Studies do indicate that children who do attend Pre-kindergarten learn language, social skills, and practical skills that enhance their chances for future achievement. Culturally and linguistic strategies are needed to ensure all children are successful regardless of their background.

### **The Benefits of Pre-Kindergarten Programs**

Longitudinal intervention studies demonstrate the long-lasting, positive influence of quality, pre-kindergarten education. For instance, such research suggests that children who begin formal learning with strong emergent, literacy skills typically read earlier, more frequently, and are better able to develop appropriate reading strategies as a result

(Texas Education Agency 2011). Therefore, the development of these skills portends future literacy comprehension abilities; yet, more globally, they also provide the very foundation for future learning and academic experiences (Ainsworth and Laosa, 2007). Many studies continue to show the benefits of attending preschool. In fact, numerous states have conducted studies indicating that pre-kindergarten programs help children perform better throughout their school careers, which can subsequently lead to positive, synergistic economic benefits as a corollary. According to Ainsworth and Laosa, Hispanic children who attend high quality programs have the potential to increase high school graduation rates, grade retention and reduce involvement in crime and delinquency. Thus, when provided the appropriate, well-tailored and early academic support, ELL students (or any non-native, English-speaking student for that matter) can be empowered to overcome significant sociological barriers, and subsequently bridge academic performance gaps between their English-speaking peers.

Long terms studies have described a number of high quality, preschool programs that have signaled positive outcomes for students well into adulthood. For instance, The Perry Preschool Program, and the Abecedarian Project, have both demonstrated a variety of positive outcomes in the lives of young children growing up in poverty. The Perry School Program started in Michigan and was one of the first pioneering studies to measure the effects of preschool programs upon students.

### **The Perry Preschool Study**

The Perry preschool study, which employed an experimental research design, was developed by David Weikart in the early 1960s. The study was initially created in

partnership with a public school to initially help children with low IQ measures. The project was created for 3- and 4-years-old children to observe whether there were differences in the scores of the children who did and did not attend preschool programs. In terms of overall scope, this was the first longitudinal research study that would attempt to track students' performance well into the future to determine programmatic success. Specifically, the experimental design study examined African Americans with low socioeconomic status. According to Schwinhart (2003) children were randomly divided into groups, a group who received a high-quality preschool program and a group who received no preschool program. The data was collected for both groups at different times annually from ages 3 through 11, and at ages 14, 15, 19, 27, and 39-41. After each checkpoint the data was analyzed and recorded. Then, researcher used the IQ test Stanford Binet Test to assess students' intellectual performance (Schwinhart 2003).

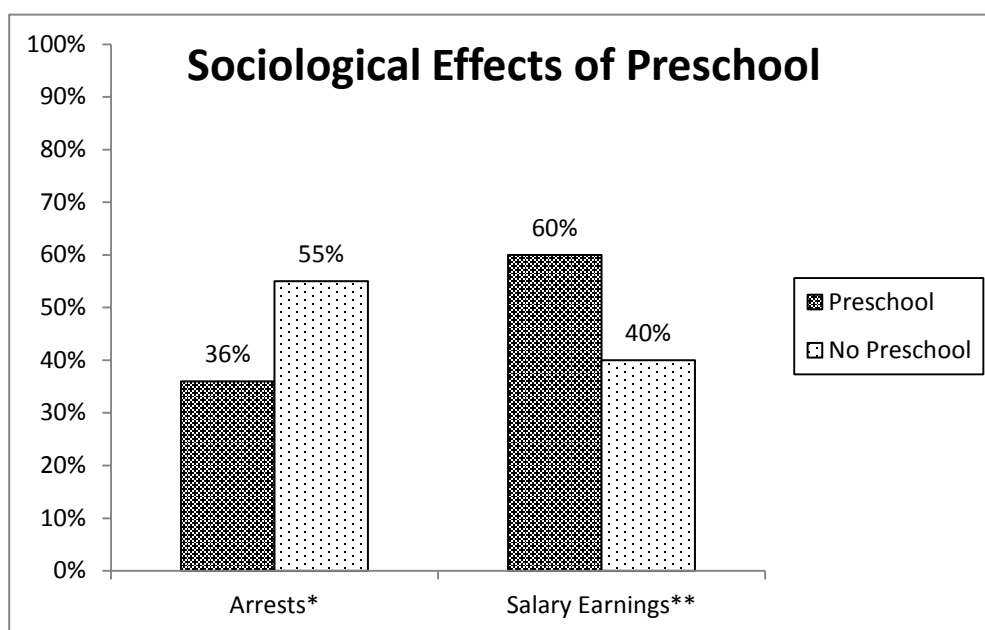
The final results of this particular study were astonishing: Simply stated, the children demonstrated higher scores early on. Of the many students tracked throughout this 38 year process, the results showed that those students who received the preschool treatment were less likely to be placed in special education and less likely to be retained. The results of the study also lead to significant changes in the way education—early education in particular—was perceived. The study shows that a high quality program for young children living in poverty, over their lifetimes, improves their educational performance, contributes to their economic development, helps prevent them from committing crimes, and provides a high return on taxpayer investment (Schwinhart, 2003).

According to Schwinhart (2003), the program yielded public benefits of \$105,324 per participant—a cost-benefit ratio of 7.16 to 1. In order of magnitude, the sources of benefits per participant were as follows:

- \$68,584 saved by the potential victims of crimes never committed, based on the typical in-court and out-of-court settlements for such crimes;
- \$15,240 in reduced justice system costs;
- \$10,537 brought in by increased taxes paid due to preschool program participants' higher earning potential later in life;
- Despite increased college costs for preschool-program participants, schools themselves saved \$7,488 in education-related expenditures, which was due primarily to the reduced need for special education and remediation services and despite increased college costs for preschool-program participants;
- \$3,475 in reduced welfare costs. (Schwinhart, 2003)

In lieu of these specific findings, this program served as the pioneer for future studies that captured the serious attention of those interested in evaluating the objective outcomes related to prekindergarten programs.





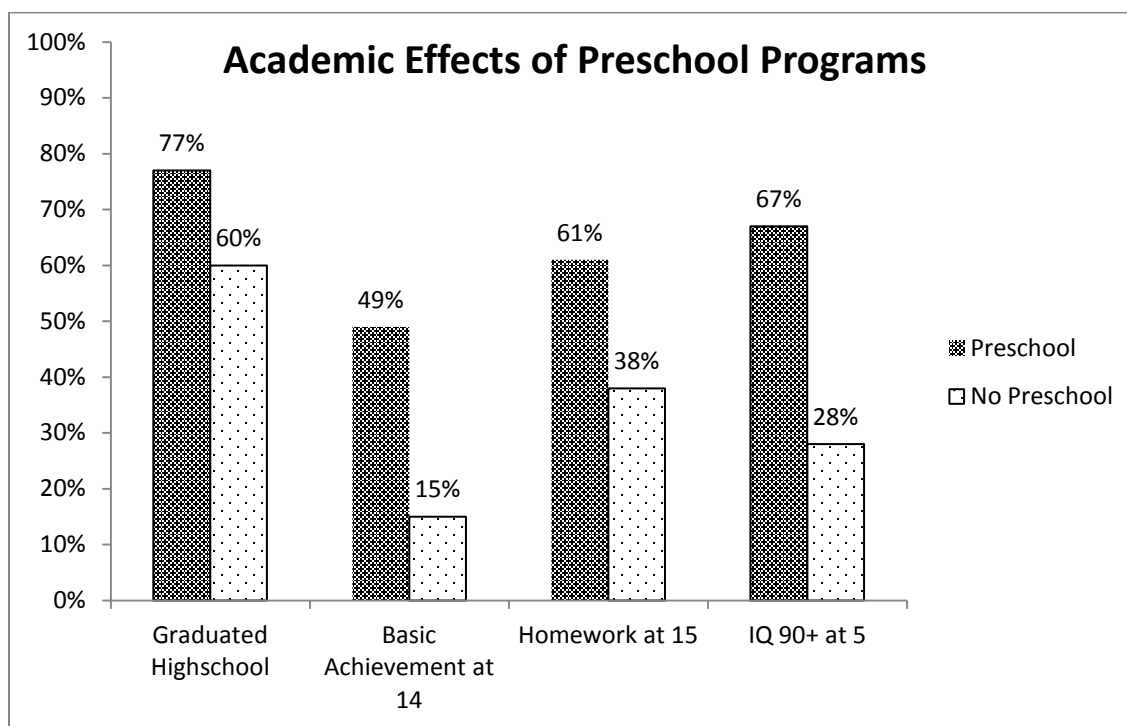
*Note:* \* = Having 5+ arrests by the age of 40; \*\* = Earning an annual salary of \$20+ at age 40.

*Figure 4.* Sociological effects of preschool programs. This figure illustrates a sociological comparison of students with preschool participation vs. those students without a preschool participation/experience.

As illustrated Figure 4 above, Schwinhart's 2003 study also found that, by the age of 40 years old, adults who had participated in the preschool program received higher earnings – 20% higher, to be exact. Thus, this information allows one to conclude that those students who receive preschool education can, in fact, make greater economic contributions via increased salary earnings. Although the current research can only cite loose associations with such data, it is likely that those earning more also spending more (i.e., also contributing to the economic well being of their state).

In direct contrast, again, as illustrated in Figure 4, those individuals lacking any preschool education were more likely to experience a life of incarceration (almost 20%

more often by the age of 40). Therefore, in addition to a greater likelihood of holding a job, those with preschool education committed fewer crimes. Again, the current research could allude to the sociological effects of such comparisons; yet, it may be more revealing to explore the academic basis of this study's comparison data.



*Figure 5.* Academic effects of preschool programs. This figure illustrates an academic achievement comparison between those with preschool participation and those students without a preschool participation/experience.

In a theme similar to the sociological effects data, Figure 5 highlights the various academic gains which may be attributable to participation in a preschool program. With regard to an academic area of focus, Schwinhart's study revealed that those who participated in a preschool program (a) were 17% more likely to graduate high school; (b)

they were 34% more likely to have achieved (at least) basic levels of achievement by age 14; (c) they were 23% more likely to engage in homework on a regular basis; and (d) they were more likely to have higher IQs by the age of five (<http://www.highscope.org/Content.asp?ContentId=219>).

### **The Carolina Abecedarian Study**

In another similar research project titled Abecedarian project, significant evidence demonstrated the importance of high-quality early childhood education, which was characterized by the improvements of pupils' lives through a variety of positive outcomes. This project was a longitudinal, experimental endeavor in which study participants were randomized at birth into four groups that received an early intervention treatment. Then, project researchers monitored students between the years of 1972 and 1977. More specifically, with regard to the treatment group, the researchers focused on children from low-income families and provided them full-time, high quality educational intervention in a childcare setting from infancy through the age of five years. In addition, this particular group received the following interventions:

- Each child had an individualized prescription of educational activities.
- Educational activities consisted of "games" incorporated into the child's day. Activities focused on social, emotional, and cognitive areas of development but gave particular emphasis to language.
- Children's progress was monitored over time with follow-up studies conducted at ages 12, 15, and 21. (<http://www.fpg.unc.edu/~abc/#home>)

According the Carolina Abecedarian Project website, the results of this study also indicated:

- Children who participated in the early intervention program had higher cognitive test scores from the toddler years to age 21.
- Academic achievement in both reading and math was higher from the primary grades through young adulthood.
- Intervention children completed more years of education and were more likely to attend a four-year college.
- Intervention children were older, on average, when their first child was born.
- The cognitive and academic benefits from this program are stronger than for most other early childhood programs.
- Enhanced language development appears to have been instrumental in raising cognitive test scores.
- Mothers whose children participated in the program achieved higher educational and employment status than mothers whose children were not in the program. These results were especially pronounced for teen mothers.

Schweinhart (2003) noted that each of the above studies also share a variety of commonalties that are beginning to receive widespread attention from proponents of earlier education. Furthermore, each set of researcher's collected and analyzed data that highlighted subsequently positive effects associated with preschool programs; more importantly, they discovered that such effects continue through childhood, adolescence, and well into adulthood. All three have conducted cost-benefit analyses of their

programs, as well as their associated effects, and found significant, positive returns on investment by taxpayers. Lastly, each early childhood program study highlighted the various benefits for both children and their families—namely, they create better citizens who make a significant contribution to the economy. As adults, children from quality pre-kindergarten are more likely to be married, achieve higher educational attainment and secure better-paying jobs. Thus, pre-kindergarten education truly represents a long term investment for the individual as well as the overall society.

### **The Chicago Parent Child Center**

The Chicago Parent Child Parent Center was a study conducted in central city Chicago, Illinois. The study followed economically disadvantaged children through the age of 21; it provided education and family support services to low income children from ages 3 to 9. The study began in 1986 to investigate the effects of government-funded kindergarten programs for 1,539 children in the Chicago Public Schools. The program emphasized on elements for building academic success such as: (a) parent involvement (b) building instructional approaches tailored to children's learning styles and designed to develop their speaking, and listening skills, (c) small class sizes to provide for individual attention, and (d) attention to health and nutritional services.

The study determined that participants were less likely to have been held back a grade or placed in special education, more likely to have completed high school, and less likely to have been arrested for a crime as juvenile (Barnett, 1995). Additionally children in the preschool group were less likely to have been abused or neglected than children who did not attend. The success the program had in reducing child abuse and neglect

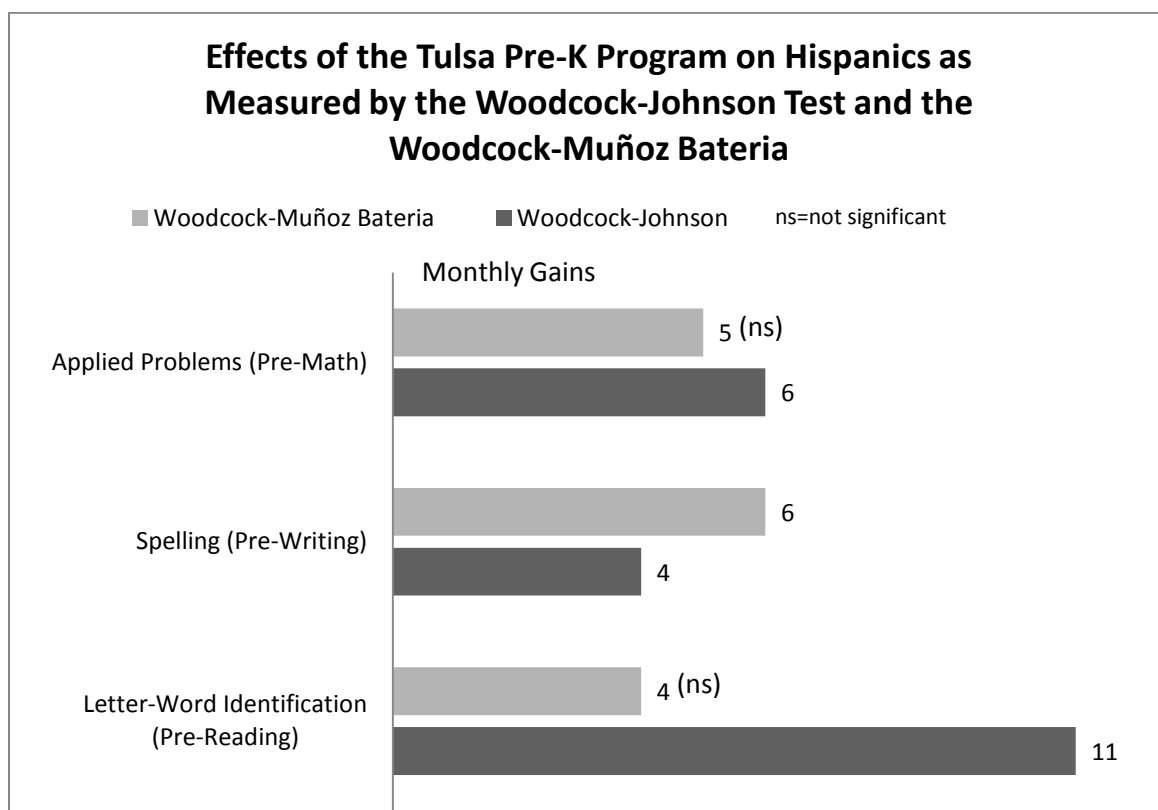
may be related to the fact that in addition to offering educational services it also emphasizes intensive family support services.

### **Oklahoma's Universal Preschool Program on Hispanic Children**

Oklahoma's Universal Pre-Kindergarten research study is the latest study on universal pre-kindergarten. The program enrolls the largest group of 4 year olds, more than any other state program in the United States (Barnett, 1995). Georgetown University conducted a study consisting of more than 3,000 children in Tulsa, Oklahoma. The program was voluntary, open enrollment, and every teacher had to be certified in early childhood.

The study consisted of the administration of the Woodcock-Johnson Achievement Test, a standardized normed test. The study showed statically significant impact of the preschool programs for Hispanic students. The gains by 4-year-olds enrolled in the school-based Prekindergarten program were significant monthly gains in all three cognitive indicators. The monthly gains depict how many months ahead in cognitive development an average 5-year-old exposed to Tulsa Pre-Kindergarten is compared to an average child of the same age who was not exposed to Tulsa Pre-Kindergarten program. In other words, these gains are above and beyond those that otherwise occur developmentally and through maturation. As shown in Figure 6, Hispanic students showed gains of 11 months in pre-reading, 4 months in pre-writing, and 6 months in pre-math skills (Gormley, 2004). Because many students speak Spanish, Hispanic students were tested in English only if they could answer questions in English;

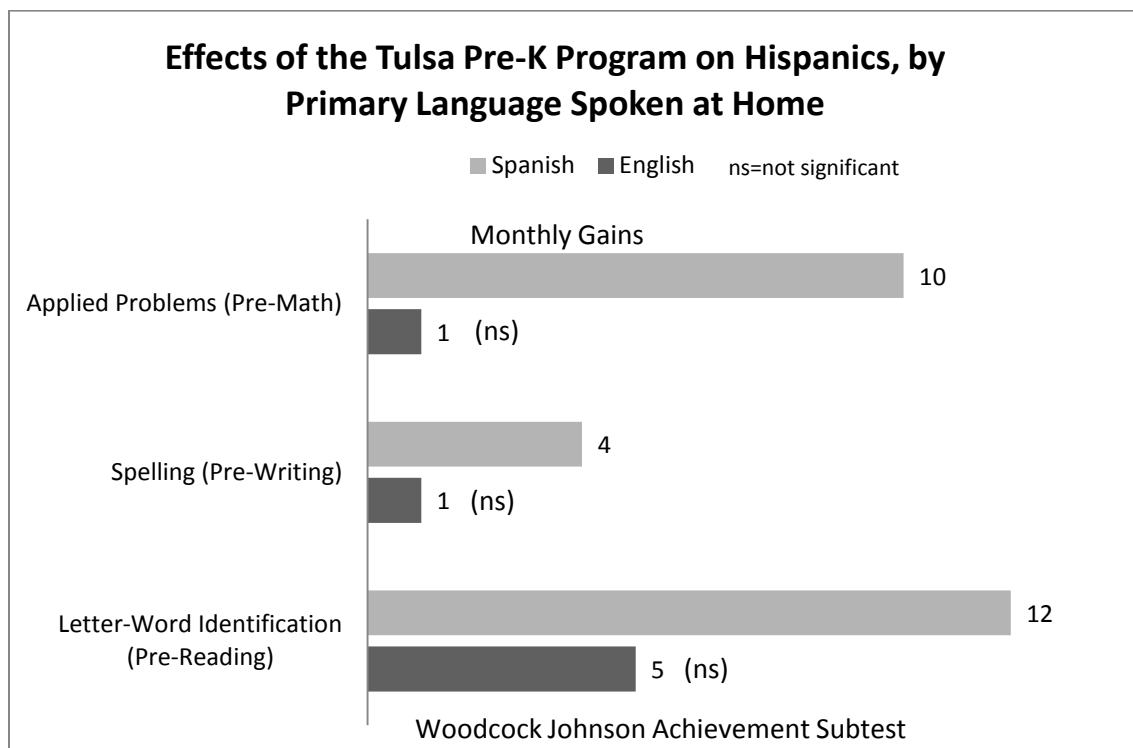
they were tested in Spanish only if they could answer questions in Spanish only however; a majority of Hispanic students were tested in both English and Spanish.



*Figure 6.* Effects of the Tulsa Pre-Kindergarten program on Hispanics as measured by the Woodcock-Johnson test and the Woodcock-Munoz Bateria. This figure illustrates the comparison of two separate tests in three separate areas of cognition.

The results also indicated that Hispanic students whose native language was Spanish benefitted more. Hispanic students speaking English at home realized positive but statistically insignificant cognitive gains, while those speaking Spanish at home

realized gains of 12 months in pre-reading, 4 months in pre-writing and 10 months in Pre-math (see Figure 7) (Gormley, 2004).

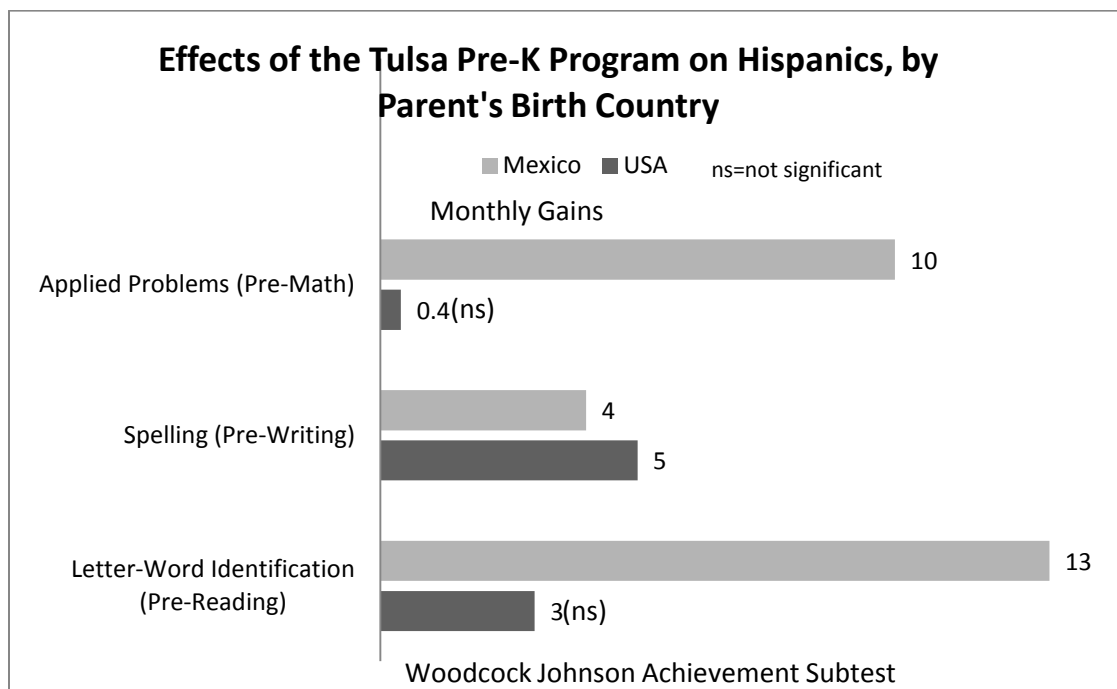


*Figure 7.* Effects of the Tulsa Pre-Kindergarten program on Hispanics, by primary language spoken at home. This figure illustrates the comparison of two separate tests in three separate areas of cognition by their primary language spoken at home.

According to William T. Gormley (2004) lead author of the study, at Georgetown University found that Hispanic children whose parent were born in Mexico benefitted from a high quality Pre-kindergarten program more than Hispanic children whose parents were born in the United States see figure 8. He also noted that Hispanic students who participated in high quality Pre-kindergarten programs improved their English language and cognitive development skills. Hispanic children in high quality Pre-



kindergarten programs are more likely to be prepared for kindergarten than those not enrolled.



*Figure 8.* Effects of the Tulsa Pre-kindergarten program on Hispanics, by parent's birth country. This figure illustrates the comparison of two separate tests in three separate areas of cognition based on parents' birth origin.

The Oklahoma Tulsa project does demonstrate the value of high quality pre-kindergarten programs especially for English language learners. Critical to this study is the number of Hispanic students participating in the program. While nationwide Hispanics are less likely to enroll in preschool, Tulsa manages to make a difference (Gormley, 2004). These findings can impact policy and funding decisions across the country as many states consider expanding or restructuring preschool programs.

Children enrolled in a full-time, early childhood program tend to have a better life than children who are not. Numerous studies indicate that children who attended a preschool program have higher incomes, higher education levels, higher social and economic status and, furthermore, are less likely to abuse drugs or be involved in criminal activities (Barnett, 1995).

### **Quality Pre-Kindergarten Programs**

The overall structure and quality of pre-kindergarten programs naturally vary from state to state. Yet, current educational research identifies the following elements as necessary for programmatic success:

- A quality, certified teacher is needed to have an effective, high quality, preschool program. Quality teachers must have the certification and degree to serve early learners.
- Meaningful, professional development is needed to ensure that teachers are continuing learning the skills required to meet the needs of individual learners.
- Continued funding to provide the resources needed to maintain a program.
- Expanding half-day to full-day programs

Thus, quality programming begins with a strong pre-kindergarten program that prevents disparities and allows all children to have opportunities to be successful. One of the challenges in a quality pre-kindergarten program is staffing a quality early childhood teacher. While many states have many different standards, a quality teacher makes a difference in the academic achievement of students.

Many pre-kindergarten staff lack training and professional development related to working the culturally linguistic diverse children. This many times hinders the ability to foster development of language minority children. It is critical to work with universities to ensure they are preparing future teachers to meet the needs of diverse learners. A survey was administered to early childhood administrators reported that the lack of bilingual staff and lack of training in serving diverse children is one of the most urgent challenges in serving Hispanics (Buenafe , 2011).

### **Communication**

One of the biggest challenges between English speaking schools and Hispanic parents is the language barrier. Many parents speak little or no English and many do not know how to communicate with the school. According to the Tomas Rivera Policy Institute survey, many respondents expressed concerns about language and community outreach that reflects the challenges faced by educators:

- 88 percent of the respondents said that a teacher or staff member in pre-kindergarten programs should be bilingual in order to communicate with non-English speaking parents
- 85 percent thought it is very important that instruction and activities in pre-kindergarten are conducted both in English and Spanish throughout the day.
- 33 percent believed that the primary reason that some Hispanic parents may not enroll their children in a pre-kindergarten program is that they do not know services are available in their communities (Zarate & Perez, 2006).

Effective communication is the key to ensuring a successful program for

Pre-kindergarten Hispanic children. The need to inform Hispanic parents of the Pre-kindergarten opportunities that may be available in their communities and the need to engage parents requires effective consistent communication skills from administrators and teachers.

Quality pre-kindergarten programs that are established in high-poverty areas serve to prevent dropouts; and to strengthen communities by increasing graduation rates, reducing crime rates, creating opportunities for employment, and encourage improved housing for all.

### **Summary of the Review of Literature**

To state that effective, pre-kindergarten programs are important for the success of all children would, in itself, be an understatement. Since the institution of the No Child Left Behind Act of 2001, pre-kindergarten programs have provided opportunities for Hispanic English Language Learners to close the achievement gap, improve school readiness indicators and improve their overall academic performance. Students who attend pre-kindergarten programs are more likely to graduate from high school and perform better academically. Furthermore, these particular students are less likely to repeat a grade or require special education.

English Language Learners also benefit from a pre-kindergarten program that provides the necessary language development, as well as curricular continuity and increased learning time—absolute necessities if such programs are to have their fullest impact on children. Finally, the Pre-kindergarten-3 years are critical years for developing

mastery of the sounds, structure, and functions of language, and thus are an ideal time to expose children to the benefits of two languages (Espinosa, 2008).

## CHAPTER THREE

### METHODOLOGY

#### **Introduction**

The purpose of this study was to explore the relationship between participation in an early childhood pre-kindergarten programs and academic success in grade three, for low-income, Hispanic English Language Learners – specifically, those Kindergarten-level children enrolled in the Houston Independent School District (HISD) in 2008 who were identified as either having participated, or as not having participated in a pre-kindergarten (Pre-K) program in the previous year. Academic success was assessed by reviewing various outcomes when those same students should have been in grade three (i.e., during the 2010-2011 school year). These outcome measures included: (a) Performance on the Texas Assessment of Knowledge and Skills reading and mathematics assessments, (b) student retention rates, (c) school attendance, (d) number of disciplinary incidents, (e) the percentage of students who were classified as gifted and talented, (f) the percentage of students who were eligible for special education services and, (g) student retention rates. This chapter includes a description of the sample, instruments, procedures, and data analysis.

#### **Participants**

The participants in this study were students who had been enrolled in Kindergarten in HISD during the 2007-2008 school year, and who were still enrolled in the district in 2010-2011. Students were required to have been continuously enrolled in the district during the intervening years.

**Population**

The Houston Independent School District (HISD) is a racially, ethnically and economically diverse community. HISD is the largest school district in Texas, and the seventh largest in the United States. During the 2010-2011 school year, it served approximately 203,000 students – including 61,946 English Language Learners (ELLs) (30.5% of the total enrolled). Hispanics make up 61.9% of enrolled students overall, and 93.6% of all English Language Learners. Eighty-one percent of students in the district are considered economically disadvantaged, and the corresponding figure for ELLs is 94.6%.

**Kindergarten and Pre-kindergarten**

There were 16,673 students enrolled in Kindergarten in the district during 2010-2011, and 16,786 enrolled in Pre-K. Of these enrolled numbers, 44.2% of kindergartners were ELL, as were 47.4% of students in Pre-K. In addition, nearly all ELLs at these grade levels (94.1% for kindergarten and 94.9% for Pre-K) were classified as economically disadvantaged.

**Program**

In compliance with the Texas Education Code § 29.153, which states that free pre-kindergarten shall be offered for eligible children, HISD provides pre-kindergarten classes for Houston-area four-year old students. The program curriculum focuses on beginning literacy, numeracy, and socio-emotional development in order to support the individual linguistic and cultural needs of each eligible child served. Furthermore, the

pre-kindergarten program curriculum forms the basis of students' future academic success.

Program eligibility for participation in the pre-kindergarten, non-tuition program is based upon the following:

- (a) four years old on or before September 1 of the school year;
- (b) live in the HISD attendance boundary;
- (c) meet immunization requirement; and
- (d) meet at least one of the following conditions:
  - Child is unable to speak and comprehend the English language
  - Child is homeless
  - Child is economically disadvantaged
  - Child of an active duty member of the armed forces
  - Child is or ever has been in the conservatorship of the Department of Family and Protective Services.
  - Child is eligible for Head Start

HISD also operates full-day, pre-kindergarten classes, which are six hours all over the district.

### **Sample**

The present study investigates academic achievement of economically disadvantaged, Hispanic ELL students who either participated or chose not to participate in Pre-kindergarten programs offered by HISD. The specific criteria for inclusion within this research study were as follows: (a) students were enrolled in HISD in kindergarten



during the 2007-2008 school year; (b) they were enrolled in the district during the 2010-2011 school year as well as during each intervening year; and (c) students were Hispanic, economically disadvantaged, and ELL in 2007-2008. All subject inclusion data were based on information in the Public Education Information Management System database (PEIMS). Students were divided into two groups, based on whether they had been enrolled in the district's Pre-kindergarten program during the 2006-2007 school year (also based on PEIMS data).

In total, 6,746 students enrolled in kindergarten during the 2007-2008 school year met the above inclusion criteria (i.e., all were Hispanic, economically disadvantaged, and ELL as determined by PEIMS). Of these eligible study participants, 5,163 were continuously enrolled in the district during the 2008-2009, 2009-2010, and 2010-2011 school years. This final cohort was further adjusted after checking to determine the status of Pre-kindergarten enrollment during the 2006-2007 school year. Subsequently, since PEIMS indicated that they were in grade K in both 2006-2007 and 2007-2008, 112 students were removed from the cohort. This adjustment resulted in a final cohort of 5,051 students, of whom 4,208 (83.3%) had been enrolled in Pre-kindergarten and 843 (16.7%) had not been enrolled in Pre-kindergarten.

### **Data Sources**

With the exception of the TAKS, all data were derived from student records available through the district. Student retention, gifted and talented status, and special education status were from the district PEIMS records. Student attendance and discipline records were drawn from HISD's Chancery data system. The fall PEIMS snapshot

database was used for PEIMS data. This data is fixed as of the fall 2011, and does not change once it is finalized. However, the district also uses a system called Chancery to track student data on a continuous basis, including enrollment, attendance, discipline, home address, contact information, etc. Data in Chancery is updated throughout the year, but is the only source for some of the variables of interest in this study.

### **Texas Assessment of Knowledge and Skills**

The Texas Assessment of Knowledge and Skills (TAKS) is a state-mandated, criterion-referenced test. This test was first administered in Texas in the spring of 2003. The Spanish version measures the performance of students in reading and mathematics in grades 3 through 5, writing at grade 4, and science at grade 5. The English-language version measures academic achievement in reading at grades 3 through 9, English Language Arts at grades 10 and 11, mathematics at grades 3 through 11, writing at grades 4 and 7, social studies at grades 8, 10, and 11, and science at grades 5, 8, 10, and 11.

The Spanish version of the TAKS is not a translation of the English version; nonetheless, it does include various items that are translated (taking into account cultural and linguistic appropriateness), as well as some items that are independently developed entirely in Spanish. As a result, the Spanish and English versions of the TAKS include different items. Students take the English or Spanish TAKS according to the language of their reading/language arts instruction.

For this study, only data from the Spanish language TAKS was used. This decision was made because at the elementary level, most ELL students participate in some form of bilingual program, and all program models in HISD call for predominantly

Spanish-language instruction at third grade. Thus, most students included in the sample will take the Spanish TAKS, rather than the English TAKS. The number of students in the sample who are in an ESL program, and who would be tested in English, was less than 50, which is too small a sample to analyze separately.

Both English and Spanish TAKS tests in grades 3 through 8 include vertical scales for reading and mathematics. Scale scores range from 0-1000 and allow users to chart student progress from grade to grade. Vertical scale scores cannot be compared across subject or test language version. For this study, data analyzed were the average Spanish TAKS scale scores and the percentage of students who had met the standard (passed) the reading and mathematics assessments.

## **TELPAS**

The Texas English Language Proficiency Assessment System (TELPAS) was developed in order to assess the level of English language proficiency for ELL students in Texas. Under TELPAS, ELL students in kindergarten through twelfth grade are assessed in four language domains: listening, speaking, reading, and writing. Proficiency scores in each domain are in turn divided into four proficiency levels: Beginning, Intermediate, Advanced, and Advanced High. A composite score showing overall proficiency is then calculated from these individual domain scores,

English listening, speaking, and writing proficiency in TELPAS are assessed holistically, i.e. via teacher ratings. Raters must be trained and recertified each year. The reading component of TELPAS is assessed via teacher ratings for ELL students in grades K and 1, but is done by multiple-choice test for grades 2 through 12.

### **Student Retention**

A student who was enrolled in kindergarten in 2007-2008 should have been in third grade during the 2010-2011 school year – assuming they did not repeat or skip a grade. PEIMS data was used to extract the current grade for every student in the sample, in order to determine whether a student was on or above third grade, or whether they were in grades two or lower as of 2010-2011. The data analyzed were the number and percentage of students who were either at or above, or below, the grade-three level.

### **Gifted and Talented**

PEIMS data includes data on various student characteristics, one of which is whether they are considered gifted and talented. According to the Texas Education Code §29.121 and the Houston Independent School District (HISD) Board Policy, G/T students are “those identified by professionally qualified persons, who perform at, or show the potential for performing at a remarkably high level of accomplishment when compared to others of the same age, experience, or environment. These are students who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society. Students capable of high performance include those with demonstrated achievement and/or high potential ability in any of the following areas:

- Exhibits high performance capability in an intellectual, creative, or artistic area
- Possesses an unusual capacity for leadership
- Excels in a specific academic field

Students in the district qualify for Gifted and Talented status if they meet certain requirements on the district rubric. In addition, all of the district's Kindergarten classes are tested annually in October to determine whether they qualify.

For all students in the sample, PEIMS records for 2010-2011 were analyzed to determine the number and percentage of students who were coded as Gifted and Talented. This calculation was also done for the baseline year of 2007-2008 to ensure that the G/T percentages for the Pre-kindergarten and non-Pre-kindergarten groups did not differ originally. Data analyzed were the number and percentage of students who either were or who were not Gifted and Talented.

### **Special Education**

Student special education status as of 2010-2011 was also extracted from PEIMS records. For all students in the sample, PEIMS records for 2010-2011 were analyzed to determine the number and percentage of students who were coded as eligible for special education. This calculation was also done for the baseline year of 2007-2008 in order to ensure that the special education percentages for the Prekindergarten and non-Prekindergarten groups did not differ originally. Data analyzed were the number and percentage of students who either were or who were not eligible for special education services.

### **Attendance**

HISD's Chancery database contains information on daily attendance for each student. Average daily attendance during 2010-2011, which is expressed as a percentage, was obtained for each student in the sample. Then, a comparison was made between the

average attendance of students who either had or had not attended Pre-kindergarten.

### **Disciplinary Incidents**

HISD's Chancery database also was used to obtain information on the number of disciplinary incidents in 2010-2011 for each student. The total number of incidents for each student was extracted, and a comparison made between the mean number of incidents of students who either had or had not attended Pre-kindergarten.

### **Research Design**

Given that student membership in the Pre-kindergarten or non-Pre-kindergarten group was already determined, and student membership in either group was not assigned randomly, this study utilizes an ex-post facto design. The study could also be considered a natural experiment in which all students who were enrolled in kindergarten during the 2007-2008 school year were selected, as long as they were ELL, Hispanic, and economically disadvantaged. The latter three variables were based on information in the 2007-2008 PEIMS database for HISD. Subsequently, this sample was narrowed to include only those students who had also been enrolled in HISD during the years 2008-2009 through 2010-2011. Finally, the sample was further narrowed to exclude students who had been in kindergarten in the 2006-2007 school year. Therefore, the final sample included only students who met the selection criteria, who had been in continuous enrollment in HISD from 2007-2008 through 2010-2011, and who had either been in Prekindergarten or not been enrolled during the 2006-2007 school year. Archival data from student records was analyzed, including data from HISD's PEIMS and Chancery databases, as well as information on TAKS performance in 2010-2011.

In order to control for Type I error rates, statistical analysis employed the Bonferroni approach across all between-group comparisons. The design of this study involved only two groups - Pre-kindergarten and non-Pre-kindergarten. However, there were a total of ten different outcome measures used to assess whether Pre-K participation affected student academic performance (TAKS reading and mathematics in Spanish and English, retention, G/T status, special education status, TELPAS data, attendance, and disciplinary incidents). Each of these different measures could be considered one sample from more global hypotheses concerning the effect of Pre-kindergarten participation, and are thus not truly independent. Accordingly, the significance level for all individual comparisons in the study were set at  $p < \alpha/10$ , to adjust for the increased chances of a Type I error with multiple comparisons.

## **Procedures**

A request for data was submitted to the HISD Research and Accountability Department. The student sample was selected by following the procedures described in the previous section. The data request included specific instructions to ensure that the sample of students selected was chosen in the manner intended. All students were identified using only archival copies of HISD's PEIMS data files for the years 2006-2007 through 2010-2011. This file, along with student demographic and performance data, were provided to the researcher with all individual student identifying information removed. Specifically, this file included the following student items: (a) student grade level, ELL status, and ELL program for every year between 2006-2007 and 2010-2011,

and (b) student G/T and special education status for the 2007-2008 and 2010-2011 school years.

### **Data Collection**

The data request to HISD, besides specifying the sample of students, also included instructions concerning additional demographic and performance variables required for this study. For TAKS, data was requested for all students taking the Spanish language TAKS in 2011. Data for all students taking the regular, accommodated, or Linguistically Accommodated (LAT) versions of the TAKS was provided, and, furthermore, included the vertical scale score and whether or not the student had achieved the Met Standard or Commended levels. This information was provided for both the reading and mathematics TAKS tests.

School attendance and student disciplinary data were provided as follows. For each student, HISD was asked to provide their average daily attendance, expressed as a percentage, during the 2010-2011 school year. The district was also asked to provide the total number of disciplinary incidents for each student. All data was provided as a single table with student identifying information removed.

### **Data Analysis**

This study involves comparing the performance of two different groups of students, one of which participated in a pre-K program and one of which did not. Performance comparisons were made on ten different outcome measures, some of which were categorical in nature (e.g. retained or not retained, passed or did not pass TAKS). In addition, other comparison items were continuous in nature (e.g. student attendance rate,



TAKS scale scores). The following describes the methods used to analyze data on the various outcomes measures included in this study.

Independent-sample t-tests were conducted to compare group performance on each of the following variables: TAKS reading scale score, TAKS mathematics scale score, and student attendance rate. For the latter variable, since attendance is expressed as a percentage, data were first subjected to an arcsine transformation before being analyzed.

### **Summary**

The present study utilized archival data to compare third-grade performance of Hispanic, economically disadvantaged, ELL students who either had or who had not participated in a pre-kindergarten program in the Houston Independent School District. Multiple possible outcome measures were used to determine whether academic performance of students was affected by pre-kindergarten program participation.

## CHAPTER FOUR

### FINDINGS OF THE STUDY

#### **Introduction**

The purpose of the study was to determine if the intervention of attending pre-kindergarten program impacted the academic achievement of low socioeconomic Hispanic English Language Learners as measured by the third grade Texas Assessment of Knowledge and Skills (TAKS) test . To establish this impact, the performance of third grade students who attended pre-kindergarten in a large urban school district in Houston was compared to students who did not attend pre-kindergarten. Other indicators noted in the analysis were retention, special education referrals, discipline, TELPAS scores, Gifted and Talented status, and attendance. This chapter will present and analyze the data compiled from different sources and answers each question in chapter one.

#### **Research Question One**

What percentage of English language Learners students eligible for pre-kindergarten are actually enrolled in pre-kindergarten programs?

The first set of analyses to be discussed concerns the overall enrollment figures for the pre-kindergarten (PK) and non-PK (NPK) groups. During the 2007-2008 academic year, the total enrollment of LEP students in kindergarten in HISD was 7,466. Subsequently, within these particular categories, there were 159 students who had been in kindergarten (KG) (i.e., they repeated kinder in 2007-2008) or early childhood programs (e.g., private schools, Head Start, etc.). in the previous year. If this student sub-group is excluded, then 7,307 LEP students in kindergarten in 2007-2008, of whom 5,740 had

been in PK in the previous year (78.6%), with 1,567 not attending PK (21.4%). When the sample was limited to those students who met the additional selection criteria for the study (i.e., Hispanic, economically disadvantaged, continuously enrolled in the district in 2007-2008 through 2010-2011, in a bilingual program in 2007-2008), the total sample was reduced to 4,643, of whom 3,876 had been in PK (83.8%) and 767 were NPK (16.5%). Summary data shown in Table 4.1 below illustrates that most LEP students attended PK, and that the sample used in the present study (Hispanic, economically disadvantaged, etc.) was slightly more likely to have participated in PK.

Table 4.1

*Number and Percentage of LEP students in Kindergarten (2007-2008)*

Student Group	All LEPs	Study Sample
PK	5740 (78.6%)	3876 (83.5%)
NPK	1567 (21.4%)	767 (16.5%)
TOTAL	7307 (100%)	4643 (100%)

*Note:* Data was drawn in 2007-2008, yet reflects program participation from the previous year; PK = Pre-Kindergarten Participation; NPK = No Pre-Kindergarten Participation.

## **Research Question Two**

Were there any notable trends which distinguished those ELL students who participated in Pre-K and those who did not?

Given the available data provided, the analyses within this section compared the PK and NPK groups in order to determine whether there were any systematic differences between them. The researcher began by comparing those programs students had been

enrolled in during the 2007-2008 school year. This comparison included all students in the final study sample, but also included students who had been in either an ESL program, or who had received a program waiver while in kindergarten. The following table illustrates the resultant findings of this particular comparison:

Table 4.2

*Number and Percentage of LEP Students in Kindergarten by Program Type (2007-2008)*

LEP Program	PK	NPK
Bilingual	3876 (92.1%)	767 (91.0%)
ESL	116 (2.8%)	19 (2.3%)
Waived	217 (5.2%)	57 (6.8%)

*Note:* PK = Pre-Kindergarten Participation; NPK = No Pre-Kindergarten Participation.

These findings specifically demonstrate that the majority of LEP students in the original study sample were enrolled in a bilingual program during KG. Furthermore, the percentages of students in the various programs did not differ between the PK and NPK groups ( $\chi^2 = 4.10$ ,  $p > .12$ , n.s.). Therefore, for each of the subsequent analyses in this study, students who had been in an ESL program, or who had been waived from LEP program services, were excluded. These two category samples accounted for 8.0% (PK) and 9.0% (NPK), respectively.

The final student sample ( $N = 4,643$ ) was then further analyzed to determine whether other notable demographic characteristics differed between the PK and the NPK

groups. The demographic variables included gender, immigrant status, and migrant student status as of the 2007-2008 academic year. In addition, the two primary sample groups were compared using student LEP status as of 2010-2011(i.e., when most were in the third grade). The results for these analyses are shown in the following table:

Table 4.3

*Comparison of Pre-Kindergarten & Non Pre-Kindergarten LEP Status (2010-2011)*

	Category			<i>p</i>
	PK	NPK		
Still LEP (2010-11)	3808 (98.2%)	754 (98.3%)	< 1.0	n.s.
Male (2007-08)	2015 (52%)	406 (52.9%)	< 1.0	n.s.
Immigrant (2007-08)	218 (5.6%)	86 (11.2%)	32.68	< .000001
Migrant (2007-08)	19 (0.5%)	5 (0.7%)	< 1.0	n.s.

Table 4.3 shows that very few students in the sample had exited LEP status by third grade in 2010-2011. For instance, only 1.8% of students in the PK group had exited; and, comparatively, only 1.7% of those in the NPK group had exited. This difference was not significant ( $\chi^2 < 1.0$ , n.s.). Similarly, there were no differences between the PK and NPK group in terms of their gender composition. Fifty-two percent of the PK group was male, as compared to 52.9% of the NPK group. Once again, this was not a significant difference ( $\chi^2 < 1.0$ , n.s.). Additionally, there was no difference between the groups in the percentage of students with migrant status ( $\chi^2 < 1.0$ , n.s.). For

both groups, less than one percent were migrant students at the time they were in kindergarten.

The only demographic variable that did, in fact, differ between the PK and NPK groups was immigrant status. Very few students in either group were considered to be an immigrant (5.6% for PK and 11.2% for the NPK group); nevertheless, the difference in percentages was significant ( $\chi^2 = 32.68$ ,  $p < .000001$ ). Thus, a student's status as a recent immigrant may have contributed to their likelihood of not having participated in a pre-kindergarten program. It is important to note, however, that most students in the NPK group (88.8%) were not immigrants, which means that this should not be a factor for the sample majority.

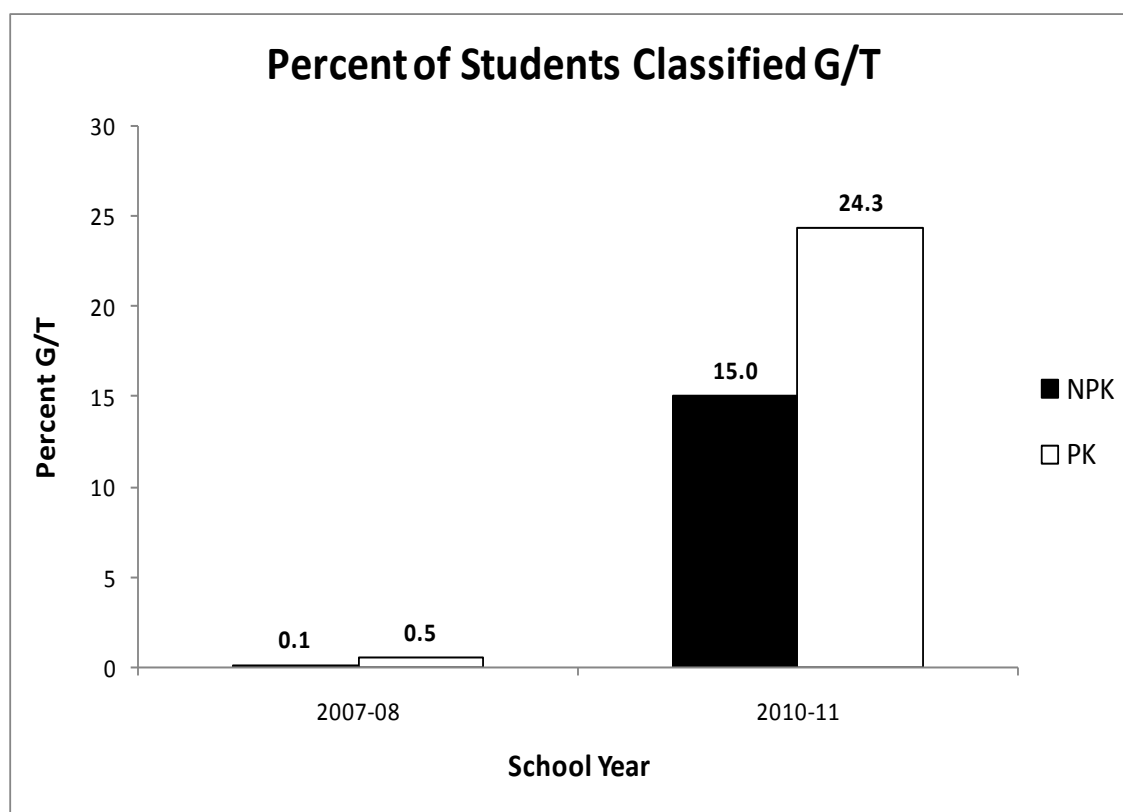
### **Question Number Three**

Did pre-K participation have an increase on the number of students qualifying for gifted and talented?

Gifted and talented status for all students was available for both 2007-08 (i.e., when they were all in KG) and for 2010-2011. The comparison of the number and percentage of students in the PK and NPK groups who were coded as G/T. (see Table 4.4).

The first analysis of G/T data compared G/T status for the PK and NPK groups in 2007-2008 (i.e., when all students were in KG), which is displayed in the top two rows of Table 4.4. Very few students in the sample were coded G/T when in KG ( $< 1.0\%$  for both groups). This difference did not reach statistical significance ( $\chi^2 = 1.03$ ,  $p = .155$ ).

Secondly, the data concerning G/T status during 2010-2011 are shown in the bottom two rows of Table 4.4. The PK statistics within this section revealed a higher percentage of students coded as G/T (24.3%) than did the NPK group (15.0%). By comparison with the previous years, this difference was significant ( $\chi^2 = 31.12$ ,  $p < .000001$ ). Summary data for Gifted and Talented status are also in Figure 9.



*Figure 9.* Effect of preschool program on Gifted/Talented status. This figure shows the percentage of students in the PK and NPK groups classified as G/T, when students were in kindergarten (2007-2008) and when they had reached grade 3 (2010-2011).

Table 4.4

*Comparison of Pre-Kindergarten & No Pre-Kindergarten on Gifted and Talented Status*

	Category			<i>p</i> (1-tailed)
	G/T	Not G/T		
PK (2007-08)	18 (0.5%)	3,858 (99.5%)	1.03	0.155
NPK (2007-08)	1 (0.1%)	766 (99.9%)		
PK (2010-11)	936 (24.39%)	2922 (75.79)	31.12	0.0000001
NPK (2010-11)	115 (15.0)	651 (85.01)		

*Note:* Data are shown for both the 2007-2008 and the 2010-2011 academic school years.

#### Question Number Four

Did Pre-kindergarten participation have an increase on student achievement as measure by the Spanish and English-language TAKS tests?

This section reports on the analyses conducted using student TAKS data that were collected from student responses in 2010-2011. Of 4,643 students in the final sample, 3,355 completed the TAKS reading test in Spanish, while 770 completed the same test in English. In sum, these test administrations accounted for 88.8% of students in the sample. In addition, 3,338 students completed the TAKS mathematics test in Spanish, and 786 completed it in English, which also accounted for the 88.8% of students in the sample.



### Spanish TAKS Reading

A total of 2,816 students from the PK group and 539 from the NPK group completed the Spanish TAKS reading test. For these two groups, the students' reading assessment results are displayed in the top two rows of Table 4.5. Specifically, each group section illustrates the average scale score on the TAKS reading test, as well as the percentage of students who achieved the "met standard" level of performance. In addition, the research utilized a t-test for independent groups to compare average scale scores for the two groups, which is also shown in Table 4.5 below. The results of this analysis reveal that the PK group had a higher average scale score than did the NPK group (642 vs. 631). Also, using the adjusted  $\alpha$ -levels employed here, the difference was marginally and statistically significant ( $t_{3,353} = 2.438$ ,  $p = .0075$ , n.s.). Details of the statistical analysis are shown in Appendix A.

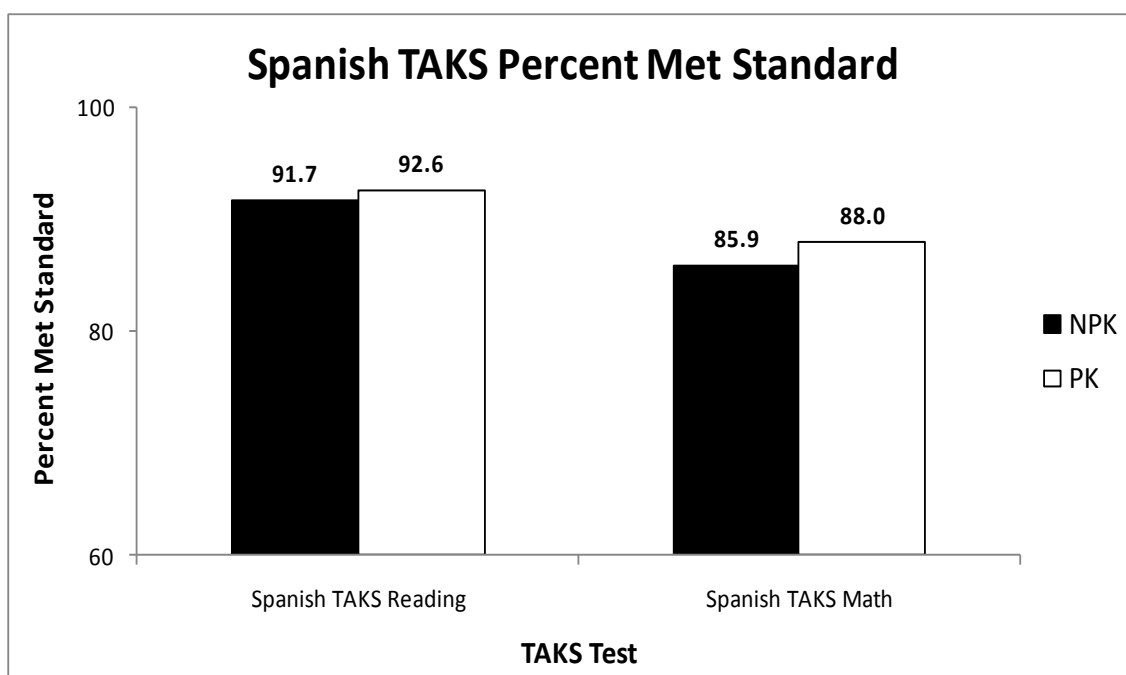
Table 4.5

*PK and NPK Spanish Language TAKS Results for Reading and Mathematics (2011)*

	Scale Score	Met Standard	t-test	$p$ (1-tailed)
PK Reading (Span)	642	92.6%	$t_{3,353} = 2.438$	0.0075
NPK Reading (Span)	631	91.7%		
PK Math (Span)	620	88.0%	$t_{3,336} = 2.966$	0.0015
NPK Math (Span)	605	85.9%		

### Spanish TAKS Mathematics

A total of 2,799 students from the PK group and 539 from the NPK group completed the Spanish TAKS mathematics test (see Table 4.5). Within this analysis, the average scale score on the TAKS mathematics test are shown for each group. Once again, Table 4.5 shows the percentage of students who achieved the “met standard” level of performance. A t-test for independent groups was again used to compare average scale scores for the two groups. Subsequently, the results showed that the PK group had a higher average scale score than did the NPK group (620 vs. 605), and that this difference was significant, ( $t_{3,336} = 2.966, p = .0015$ ). Details of the statistical analysis are shown in Appendix B, and summary results for Spanish TAKS tests are also shown in Figure 10.



*Figure 10.* Effect of preschool program on Spanish TAKS passing rate. This figure shows the percentage of students in the PK and NPK groups meeting the TAKS passing standard in 2011, for the reading and mathematics tests.

### **English TAKS Reading**

In the second TAKS content analysis, a total of 678 students from the PK group and 92 NPK students took the English TAKS reading test. In similar fashion, the results are displayed in the top two rows of the table (see Table 4.6). The average scale score on the TAKS reading test are displayed for each group, as well as the percentage of students who achieved the “met standard” level of performance.

A t-test for independent groups was employed to compare average scale scores for the two groups. Subsequently, the results showed that there was no evidence for a performance advantage for the PK group on scale score ( $t_{768} = 0.166$ ,  $p = .454$ ). In fact, this reported “lack of performance advantage” was evident even though the PK group had an advantage in percent passing the TAKS reading test. Details of the statistical analysis are shown in Appendix C.

### **English TAKS Mathematics**

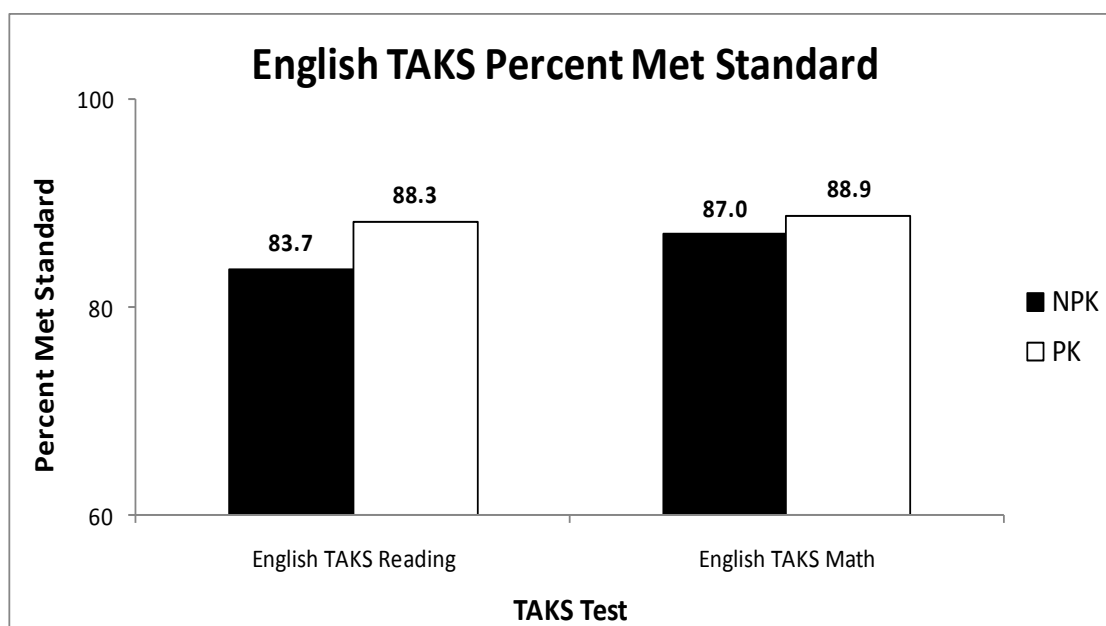
Finally, in the final portion of the second TAKS analysis, a total of 694 students from the PK group and 92 students from the NPK group completed the English TAKS mathematics test. The results are shown in the bottom two rows of Table 4.6. Again, the average scale score on the TAKS reading test are shown for each group, as well as the percentage of students who achieved the “met standard” level of performance. As in previous sections, the researcher employed a t-test for independent groups in order to

compare average scale scores of the two groups. And, while the PK group had a slight advantage over the NPK group in average scale score (600 vs. 590), this difference was not significant,  $t_{784} = 0.966$ ,  $p = .167$ . Details of the statistical analysis are shown in Appendix D.

Table 4.6

*PK and NPK English Language TAKS Results for Reading and Mathematics (2011)*

	Scale Score	Met Standard	t-test	$p$ (1-tailed)
PK Reading (Eng)	599	88.3%	$t_{768} = 0.116$	0.454
NPK Reading (Eng)	600	83.7%		
PK Math (Eng)	600	88.9%	$t_{784} = 0.966$	0.167
NPK Math (Eng)	590	87.0%		



*Figure 11.* Effect of preschool program on English TAKS passing rate. This figure shows the percentage of students in the PK and NPK groups meeting the TAKS passing standard in 2011, for the reading and mathematics tests.

### Question Number Five

Did Pre-kindergarten participation have an increase on school attendance, disciplinary incidents, special education referrals or retentions? This section of the study explores the possible connections between students' pre-K participation and other education-related outcomes.

### School Attendance

Pre-K participation showed an effect on school-level attendance data patterns. In particular, the raw data received were the total number of days students either attended or missed school during the 2010-2011 school year. These data were used to calculate percent attendance rates (i.e., Days Attended / [Days Attended + Days Missed]). The following table denotes the results of these analysis calculations:

Table 4.7

#### *PK and NPK School Attendance Data for 2010-2011*

Group	Attendance (Days Attended/Enrolled)	t-test	p (1-tailed)
PK	98.5%	t 4,629 = 7.554	< .000001
NPK	97.8%		

Although the difference in attendance rates between the PK and NPK groups was small, it was significant,  $t_{4,629} = 7.554$ ,  $p < .000001$ . Students in the PK group had a higher attendance rate than did those in the NPK group. Details of the statistical analysis are shown in Appendix E.

### Student Discipline

Student discipline data for 2010-2011 was obtained from the district's Chancery database, and results of the analysis are shown below (see Table 4.8). A Chi-square test was used to compare the number of students in the PK and NPK groups who either had been reported for a disciplinary incident, or who had not had any disciplinary incidents recorded in Chancery. Note that for the purposes of this analysis, it did not matter how many separate incidents were reported for a given student. Students were simply coded as having received disciplinary action, or as not having been disciplined.

Table 4.8

*Number and Percentage of LEP Students in PK and NPK with Recorded Disciplinary Incidents (2010-2011)*

Group	Disciplined	No Incidents	$\chi^2$	$p$ (1-tailed)
PK	64 (1.4%)	3812 (98.3%)	7.52	0.003
NPK	24 (3.1%)	743 (96.9%)		

The results of this analysis showed that slightly more students in the NPK group (3.1%) had disciplinary incidents recorded in 2010-2011 than was the case for PK students (1.7%). Yet, despite the small overall percentage of students who were

disciplined according to district data, this difference was significant ( $\chi^2 = 7.52$ ,  $p = .0030$ ).

### Special Education Referrals

Special education status for all students was available for both 2007-2008 (i.e., when all students were in KG) and for 2010-2011. The comparison of the number and percentage of students in the PK and NPK groups who were coded as special education. The results of this analysis are shown in the following table:

Table 4.9

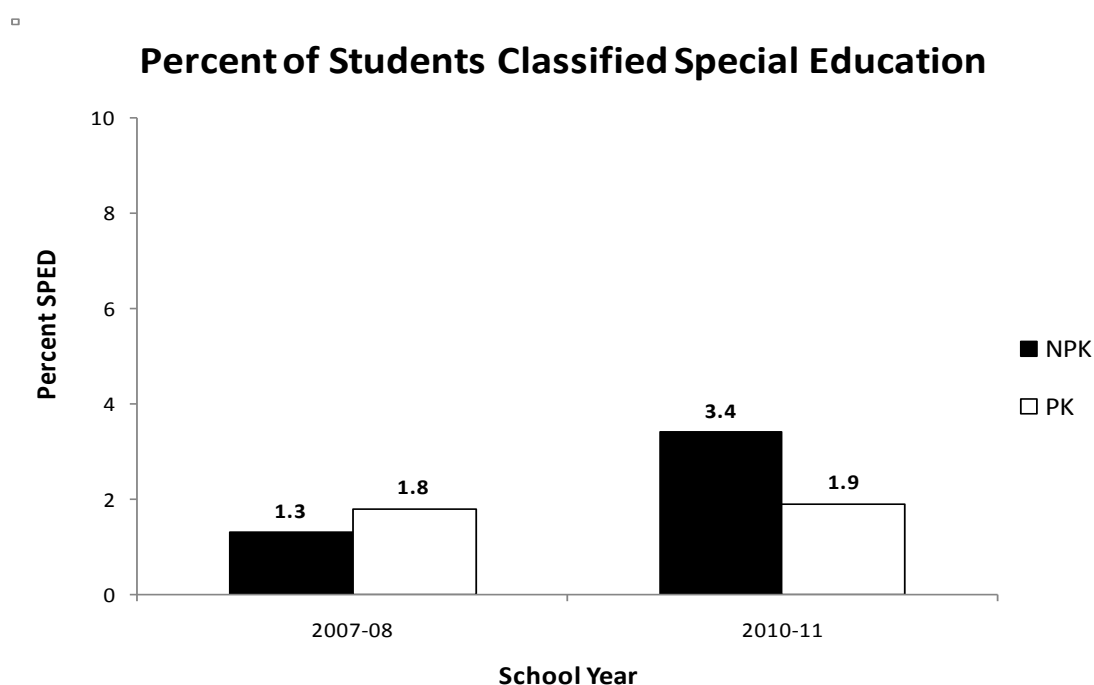
*Comparison of Pre-Kindergarten & No Pre-Kindergarten for Special Education Status*

	Category			$p$ (1-tailed)
	Special Ed.	Not Special Ed.		
PK (2007-08)	71 (1.8%)	3805 (98.2%)	1.04	0.154
NPK (2007-08)	10 (1.3%)	757 (98.7%)		
PK (2007-08)	71 (1.9%)	3734 (98.1%)	7.47	0.0031
NPK (2010-11)	26 (3.4%)	731 (96.6%)		

This initial analysis compared special education status for the PK and NPK groups in 2007-2008 (i.e., when all students were in KG), which is represented in the top two rows in the above table (Table 4.9). In reference to this particular comparison, there was no significant difference between the percentage of students coded as special education in the NPK (1.3%) and PK groups (1.8%;  $\chi^2 = 1.04$ ,  $p = .154$ ).

Special education data for 2010-2011 are shown in the bottom two rows of the table above (see Table 4.9). Unlike the 2007-2008 special education data, a student

group difference had appeared by the time they had entered into third-grade. However, by 2010-2011, students in the NPK group were more likely to have been coded as special education than were students in the PK group (3.4% vs. 1.9%). It is important to note that this resultant difference was statistically significant ( $\chi^2 = 7.47$ ,  $p = .0031$ ). Special education data are also summarized in Figure 12, which includes results for both 2007-2008 and 2010-2011.



*Figure 12.* Effect of preschool program on special education status. This figure shows the percentage of students in the PK and NPK groups classified as special education, when students were in kindergarten (2007-2008) and when they had reached grade 3 (2010-2011).

### **Student Retentions**

The entire sample of students who were included in these analyses were in KG during the 2007-2008 school year, and they should have been in the third-grade by 2010-



2011. The next set of analyses examined whether students were, in fact, on grade level by comparing the number and percentage of students who were in the third-grade (or higher) in 2010-2011 to the number and percentage of students who were in second-grade (or lower) (see Table 4.10).

As Table 4.10 illustrates, retention rates for the NPK group were approximately twice as high as those in the PK group. Specifically, for the NPK group, 15.0% had been retained by 2010-2011. With regard to the PK group, however, only 7.7% had been retained. In addition, this difference between groups was found to be significant ( $\chi^2 = 41.78, p < .000001$ ).

Table 4.10

*Number and Percentage of PK and NPK Student Retention Rates (2010-2011)*

	Category		$\chi^2$	$p$ (1-tailed)
	Retained	Not Retained		
PK	299 (7.7%)	3577 (92.3%)	41.78	< .000001
NPK	115 (15.0%)	653 (85.0%)		

### Question Number Six

Did pre-kindergarten participation have an increase on student achievement as measured by the TELPAS test?

LEP students in Texas are required to complete the TELPAS – that is, until they reach English language proficiency standards that allow them to exit LEP status.

TELPAS results for students in this study sample were available for both 2007-2008 (i.e.,

when they were in KG) and for 2010-2011. Subsequently, the data for each of these years were analyzed. For each year, the researcher compared the number and percentage of students from the PK and NPK groups scoring at the Advanced or Advanced High level to the number and percentage of students scoring at the Beginning or Intermediate levels.

Table 4.11 below displays the 2007-2008 data in the top two rows. These results show that even when students were still in KG, more students in the PK group were at the Advanced or Advanced High levels of English language proficiency than those students in the NPK group (3.7% vs. 1.6%). Although small, this particular difference was found to be statistically significant ( $\chi^2 = 8.48$ ,  $p = .0018$ ).

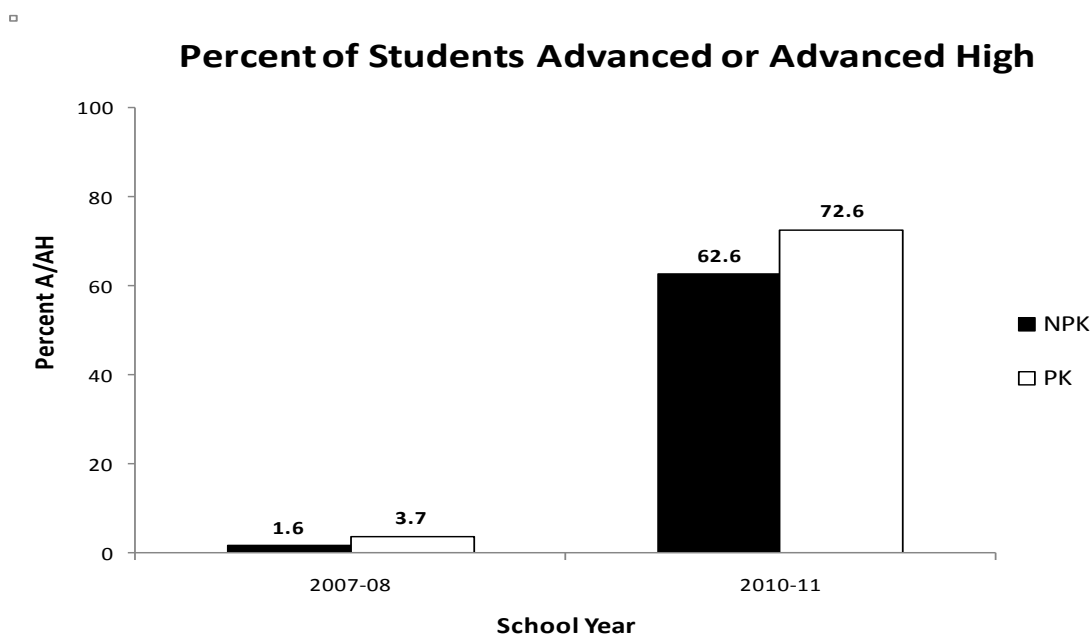
Table 4.11

*2011 TELPAS Results for PK and NPK Groups*

	Category		$\chi^2$	$p$ (1-tailed)
	$\geq$ Advanced	$\leq$ Intermediate		
PK (2007-08)	142 (3.7%)	3690 (96.3%)	8.48	0.0018
NPK (2007-2008)	12 (1.6%)	735 (98.4%)		
PK (2010-1011)	2708 (72.6%)	1024 (27.4%)	29.64	< .000001
NPK (2010-11)	456 (62.6%)	273 (37.4%)		

*Note:* The above table illustrates both the number and percentage of students scoring Advanced or Advanced High vs. Beginning or Intermediate.

Table 4.11 displays the data for 2010-2011 in the lower two rows. This section shows that the performance advantage for PK students over NPK students (72.6% vs. 62.6% Advanced or Advanced High) was even larger than it had been in KG. Moreover, this difference was found to be highly significant ( $\chi^2 = 29.64$ ,  $p < .000001$ ).



*Figure 13.* Effect of preschool program on English-language proficiency. This figure shows the percentage of students in the PK and NPK groups who received TELPAS composite proficiency ratings of either Advanced or Advanced High, when students were in kindergarten (2007-2008) and when they had reached grade 3 (2010-2011).

It may seem particularly surprising that a performance advantage for PK students would occur even while students were still in KG. Yet, this does not necessarily mean that the two groups began with different levels of English language proficiency and are, therefore, not comparable. Rather, it is important to note that the PK group received an extra year of schooling. Hence, it is logical to conclude that this extra year might produce an advantage over the NPK group. Moreover, by the time students were administered the TELPAS in spring of 2008, the PK group would have received almost two full years of schooling, as compared to only one year for the NPK group. Therefore,

it is not surprising to see a performance advantage on the TELPAS for the PK group while students were still in KG. Rather, this type of advantage is, indeed, what we could expect to see.

### **Summary**

Table 4.12 below displays a summary of the ten comparisons made between the Pre-kindergarten group and the NPK group. The summary statistics are shown for each comparison (e.g., percent of students, scale score, etc.), as well as the significance level for the individual comparison in question. Since there were ten different comparisons to make, it should be noted that a Bonferroni correction was employed. Hence, instead of using a significance level of  $\alpha = .05$  this report uses  $\alpha/10$  or .005 as the probability level required for significance. Using this specific criterion, Table 12 shows that seven of the comparisons made were statistically significant. Furthermore, all of these comparisons indicated a superior performance for students in the Pre-kindergarten group relative to those in the NPK group. In addition, students who had attended Pre-kindergarten were more likely to be Gifted and Talented, had a higher attendance rate, had higher scale scores on the Spanish TAKS math test, and were more likely to be at the Advanced or Advanced High levels on the TELPAS. In contrast, students in the NPK group were more likely to have been retained, had more discipline incidents reported, and were more likely to be referred for special education services.

Table 4.12

*Summary Results of Analyses Comparing PK and NPK Groups*

Comparison	PK	NPK	p
G/T Status	24.3%	15.0%	.0000001
Retentions	7.7%	15.0%	.0000001
Attendance	98.5%	97.8%	.0000001
TAKS Math (Spanish)	620	605	.0015
TELPAS 2007-2008 (2010-2011)	3.7% (72.6%)	1.6% (62.6)	.0018 (.0000001)
Discipline	1.7%	3.1%	.0030
Special Ed. Status	1.9%	3.40%	.0031
TAKS Reading (Spanish)	642	631	.0075
TAKS Math (English)	600	590	.167
TAKS Reading (English)	599	600	.454

*Note:* Each of the 10 different comparisons is ranked from most significant to least significant.

Lastly, one additional comparison namely, with regard to the Spanish TAKS reading test, Pre-kindergarten students did have a higher scale score than did those in the NPK group. This difference was just short of significant using the adjusted  $\alpha$  level adopted for this study ( $p = .0075$ ). And, while only signaling a marginal effect, this particular finding can also be taken as evidence for the superior performance of students in the PK group.

## CHAPTER FIVE

### CONCLUSION

Since 1985, the Houston Independent School District has continuously provided pre-kindergarten classes for four-year old students (HISD, 2011). Evaluation reports for the district's pre-kindergarten program reveal a number of facts. First, there is evidence across a number of these studies that early language development is facilitated and supported by pre-kindergarten enrollment. Student scores on both the Texas Primary Reading Inventory (TPRI) and the El Inventario de Lectura en Español de Tejas (Tejas LEE) are higher for students who have attended pre-kindergarten programs than for those who did not (HISD, 2009; 2010; 2011). Secondly, both reading and mathematics Aprenda scores are higher for students who have attended pre-kindergarten programs than for those who did not (HISD, 2008; 2009; 2010; 2011). Third, performance on the Stanford 10 reading and mathematics tests is usually (HISD, 2009; 2010; 2011) – yet, not always (HISD, 2008) – superior for students who have attended pre-kindergarten.

Finally, there is also evidence indicating better retention and promotion rates for pre-kindergarten students in comparison with peers (HISD, 2008). Thus, there is ample evidence from previous evaluations of HISD's pre-kindergarten programs that, overall, students appear to show at least short-term benefits from program participation.

The rationale of this study was to determine whether Hispanic English Language Learners (ELL) students who have attended pre-kindergarten programs achieved academic benefits by the time they reached grade three. The study chose to focus on low socio-economic, Hispanic Limited English Proficient (LEP) students. As reported by the

Texas Education Agency (2011), Hispanics are the largest and fastest growing segment of elementary school students in Texas. Additionally, significant portions of these students are also ELLs, and they also tend to fall into the low socio-economic section of the demographic. Given both the prominence of this population, as well as the continued push for accountability and data-driven decision making, it is important to determine whether Hispanic ELL students in Texas benefit from attending pre-kindergarten programs. For these reasons, archival data was analyzed from a large urban school district in Houston, Texas, to determine whether participation in pre-kindergarten programs had benefits for economically disadvantaged, Hispanic ELL students. Performance of this group was compared to that of a similar population of students who did not participate in a pre-kindergarten program.

In an effort to measure the impact of pre-kindergarten participation, six different measures were compared using these two groups. More specifically, five of the measures were focused on student performance on statewide-standardized tests. Results from the 2011 TAKS reading and mathematics tests were analyzed, for both Spanish and English language administrations. In addition, ELL student English language proficiency was assessed by analyzing data from the 2011 administration of the Texas English Language Proficiency Assessment System (TELPAS). Moreover, in addition to standardized test performance, results from five other measures were compared for pre-kindergarten and non-pre-kindergarten groups. These measures included student retention, student attendance rate, disciplinary incidents, and whether a student was qualified for either special education or gifted and talented status.

Results were analyzed using a combination of t-tests and Chi-Squared, depending on the specific data being compared. Of the ten different possible comparisons between students in the pre-kindergarten and non-pre-kindergarten groups, seven were found to be statistically significant. In each case, furthermore, students who had attended pre-kindergarten had superior performance compared to those who had not. Students who had attended pre-kindergarten had a higher passing rate on the Spanish TAKS mathematics test (88.0% vs. 85.9%), as well as a higher average scale score (620 vs. 605). Although not quite statistically significant, the results also showed that students who attended pre-kindergarten programs had higher passing rates (92.6% vs. 91.7%) and scale scores (642 vs. 631) than their peers that did not attend pre-kindergarten programs. Therefore, when these results are considered all together they are consistent with the hypothesis that pre-kindergarten enrollment leads to superior academic performance for student.

In addition to the Spanish TAKS data, results showed that students who had attended pre-kindergarten programs had higher levels of English language proficiency, as measured by the TELPAS. Interestingly, results on the TELPAS showed that, even while students were still in kindergarten, the pre-kindergarten group exceeded performance of the non-pre-kindergarten group, with 3.7% of students scoring at the Advanced level or higher, compared to 1.6% for the non-pre-kindergarten group. This finding suggests that pre-kindergarten participation can lead to small, but statistically significant, performance advantages in English language skills for ELL students as soon as kindergarten. By the time students reached third-grade, differences between the two groups were even more



apparent, with 72.6% of pre-kindergarten students scoring at the Advanced level or higher, as compared to 62.6% of students in the non-pre-kindergarten group.

Analysis of data from other measures also showed advantages for students who had attended pre-kindergarten. Students in the pre-kindergarten group had better attendance than those students in the non-pre-kindergarten group (98.5% vs. 97.8%), and more of them were considered gifted and talented (24.3% vs. 15.0%). In addition, fewer students in the pre-kindergarten group had been retained (7.7% vs. 15.0%), fewer of them had recorded disciplinary incidents (1.4% vs. 3.1%), and fewer of them were in special education (1.9% vs. 3.4%) than was the case for students in the non-pre-kindergarten group.

Conversely, English TAKS assessment data did not show any significant evidence for students who had attended pre-kindergarten programs. Neither the reading nor the mathematics results showed differences between the pre-kindergarten and non-pre-kindergarten groups that were close to being statistically significant. However, it is unclear why the English TAKS results turned out this way. One possible conclusion might be that there were simply more ELL students tested on the Spanish TAKS than on the English TAKS; thus, there was more statistical power for analyses involving Spanish TAKS data. For reading, there were 3,355 students tested in Spanish, but only 770 tested in English. On the mathematics test, there were 3,338 students tested in Spanish, and only 786 tested in English. If we examine the size of the performance advantage for students in the pre-kindergarten group for the mathematics test, they are comparable for the Spanish ( $88.0\% - 85.9\% = +2.1\%$ ) and English versions of the TAKS ( $88.9\% - 87.0\%$

= 1.9%). If the sample size for the English TAKS reading had been comparable to that of the Spanish test (approximately 3,300), results for the English TAKS may well have also been significant. For the reading test, the performance advantage for pre-kindergarten students tested in English ( $88.3\% - 83.7\% = 4.6\%$ ) is actually larger than that seen for students tested in Spanish ( $92.6\% - 91.7\% = 0.9\%$ ). Hence, this same argument may hold for the TAKS reading test. In conclusion, it might be reasonable to identify why only English TAKS data failed to show a significant performance advantage for pre-kindergarten students is that these comparisons involved far fewer students than any other, and did not have enough statistical power to demonstrate group differences.

It is also generally true that performance on all versions of the TAKS were rather high, with passing rates ranging from 84% to 93%. Consequently, there might have been a ceiling effect that included the TAKS data. This effect would have reduced the size of any observed between-group differences; thus, making it more difficult to demonstrate statistical significance. One way around this possibility might have been to use results from the new State of Texas Assessments of Academic Readiness (STAAR) tests, which are expected to be more rigorous than the TAKS. However, given that this assessment is being administered for the first time in spring of 2012, subsequent data were not yet available at the time this study was conducted. Nonetheless, one might predict that using a test like the STAAR that is expected to be more difficult for students overall; that it could prevent ceiling effects like the ones observed here; and that it might make it easier to observe and account for differences between pre-kindergarten and non-pre-kindergarten students on both English and Spanish language state assessments.

## **Implications**

This study found that participation in a pre-kindergarten program had numerous beneficial effects for a group of third-grade, economically disadvantaged, Hispanic ELL students. The results support the literature presented in Chapter Two, which demonstrate that early childhood plays a significant role on the academic achievement of Hispanic English language learners. The research concludes that English language learners who attend pre-kindergarten programs are more likely to have a higher rate of literacy that enables children to demonstrate high academic achievement and higher graduation rates while being less likely to be retained (Denton & West, 2002).

Since the implementation of the No Child Left Behind Act of 2001 (NCLB), all children are expected to perform on statewide-standardized assessments regardless of socio-economic status and background. Within this accountability system, schools and school districts must demonstrate adequate yearly progress (AYP). Moreover, by the year 2014, all students are expected to meet the goals in reading and math on state assessments. All states are required to submit data on all subgroups to ensure students are reaching proficient levels. NCLB focuses on high standards of learning and instruction with the goal of increasing academic achievement in reading and math within all subgroups in the K-12 population. With the increased awareness of NCLB, academic needs have shifted to the academic achievement of ELLs as schools, districts, and states are held accountable for teaching English and content knowledge to this special subgroup (Francis et al., 2006.).

In Texas, Hispanic English language learners are the fastest growing groups of students (Texas Education Agency, 2011). And, along with the challenges of learning a second language, many of the students are living near poverty. As reviewed in the literature, pre-kindergarten programs were initially created with purpose of exposing children with specific needs to the routines and structures their environment may not afford them; to promoting/exposing them to much-needed social and oral language development skills that are needed to enter kindergarten; and to be successful as they grow in the elementary grades.

This study was intended to ensure teachers, school leaders, and policy makers understand that an early childhood program can make a difference in the academic achievement of Hispanic English language learners. Ainsworth and Laosa (2007) noted that Hispanic children are less likely to enroll in a pre-kindergarten program; therefore, making Hispanics less likely to begin school with the readiness skills needed for reading and writing and math. Due to lack of enrollment in programs, Hispanics attend preschool and early learning programs in much lower proportions than do their whites and African American peers (Ainsworth and Laosa, 2007). This is important for the learning community since there should be more high quality programs that are suitable to the needs of English language learners and the Hispanic community. With school community building and communication in mind, it is imperative that schools create a welcoming environment to receive Hispanic families and build relationships that will encourage academic success. Moreover, in an effort for all children to have an opportunity for academic success, it is imperative for early childhood programs to

actively recruit and encourage families to enroll their children in an early childhood program and promoting early childhood programs.

According to Garcia and Gonzales (2006), a significant number of Hispanic families live in poverty with parents who have not had *any* type of formal education. The challenges of living in poverty make it more difficult for many families to attend quality pre-kindergarten programs. For these reasons, it is important that school districts and school leaders reach out to these families encouraging them to become involved in the educational setting, as well as being prepared to address the needs of the Hispanic community. Schools should make the greatest efforts to not allow language barriers to impede communication in any way. All school personnel should find a way to communicate with parents of English language learners in their dominant language or try to hire personnel that will speak the language of the community. Schools should include a parenting component to their early childhood program to educate parents on the importance of effective parenting skills. According to Ainsworth and Laosa (2007), programs that are designed to provide meals, medical services and parent trainings are more responsive to each child's ethnic, cultural, and linguistic heritage.

The need to create an effective pre-kindergarten program is critical to the success of all children. With the inception of NCLB, pre-kindergarten programs have provided opportunities for improving school readiness and academic performance (Barnett, 2002). It is critical for a program to have quality certified teachers, well trained teachers, financial resources to maintain programming, active parenting component, and expanding half days to full days. Barnett (2002) identified that quality programming begins with a

strong pre-kindergarten program that prevents disparities and allows children established in poverty areas to be successful.

### **Areas for Future Research**

A substantial body of research has demonstrated the beneficial effects of early childhood education on subsequent student outcomes. The present study also found results consistent with this general pattern – showing that a group of third-grade, Hispanic ELL students who had attended a pre-kindergarten program had a series of positive outcomes by the time they reached third-grade, in comparison with students who did not attend pre-kindergarten programs. In order to keep the investigation manageable, it was decided that the study should involve a specific student population – namely, the students involved were economically disadvantaged, Hispanic ELL students from a single large urban school district in Houston, Texas. Furthermore, data from one cohort of students was examined (i.e., students who had been in kindergarten during the 2007-2008 school year and who should have been in grade 3 in 2010-2011). At this point, based not only on recent findings, but also on results seen in the wider literature, it is worth considering what future avenues for research might be pursued.

One possible research study to be pursued should focus more specifically on this student population while including data from different cohorts of students. If we were interested in examining student performance in grade three, students who were in kindergarten during 2007-2008 simply represent the most recently available cohort. However, since this study involved only archival data, it would be comparatively effective to complete similar sets of analyses through a longitudinal study. Assuming

that similar results were to be obtained, this would greatly strengthen the present study's main conclusion regarding the benefits of pre-kindergarten for Hispanic ELLs.

Another future study worth conducting might involve a close variation over time. While the present study found a number of significant benefits for students who had attended pre-kindergarten, these effects might be considered short-term. Nearly all of the data concerning student performance were utilized while students were only in third-grade. While there was evidence that pre-kindergarten participation does affect student performance three years later, it might be more useful to confirm that these programs have long-term benefits. Furthermore, although the effects might be smaller compared to those seen in the short-term, and may diminish over time, many studies have examined the long-term effects of early childhood education, and evidence suggests that the beneficial effects of these programs are retained as a student moves through elementary, into their adolescence, and then into adulthood (Barnett, 1995).

As discussed earlier, there have been evaluations of HISD's pre-kindergarten programs; yet, most of these studies have suffered from one limitation. In particular, most of them focus on short-term effects of pre-kindergarten participation, and analyzed data from students in elementary school only – perhaps as young as first grade. Only the 2008 evaluation analyzed any data for secondary students. HISD (2008) did find that graduation rates for students were higher for those who had attended pre-kindergarten programs than for those who had not. Therefore, it would be useful if there were additional studies of the long-term effect of pre-kindergarten participation.

Accordingly, one study that should be attempted would be to study a similar group of students (i.e., economically disadvantaged, Hispanic, ELLs) but to use archival data to study their performance in middle school or even high school. Besides analyzing the same set of performance measures used in the present study (i.e., TAKS, TELPAS, retention, discipline, GT and special education status, etc.), one could also examine other measures unavailable for students in grade-three. One could study, for example, whether students who had attended pre-kindergarten with an exited LEP status more easily than did those who did not attend pre-kindergarten, or whether they exited sooner. One could also, in theory, begin to see the effect of pre-kindergarten participation on student dropouts or graduation. Yet, there would be a number of difficulties in conducting a study such as this. The most prominent difficulty would be the problems created by the loss of data from students who leave the district. However, the design of such a study would be very similar to that employed here, and it should not prove much more difficult to conduct than the present one.

Another avenue that should be explored in future research is the influence of pre-kindergarten participation on student performance by evaluating performance on other standardized tests. In particular, as was mentioned earlier, the previous Texas Assessment of Knowledge and Skills (TAKS) assessment system is being replaced with the new State of Texas Assessment of Academic Readiness (STAAR) assessment system in 2012. Students in grades 3 through 8 will take the STAAR, while those in high school will eventually take STAAR End of Course (EOC) tests. It is expected that all tests in the STAAR system will be more rigorous than those included under TAKS. Thus, it is



possible that the improved student performance on some of the TAKS tests reported here could be either magnified or diminished under the implementation of the new assessment system. One possible method might be to evaluate archival data from students who began in kindergarten in 2008-2009 (and who should have been in grade 3 in 2011-2012) to determine whether the TAKS results reported here are replicated or not.

It would have benefited the present study greatly if there would had been a way to determine the enrollment status of all students in the study who were included in the non-pre-kindergarten group. The basis for assignment of students to this group was that (a) they had been enrolled in kindergarten during the 2007-2008 school year, and (b) there was no record of them having been enrolled in any grade in the district during the previous year. It was assumed that these students were eligible to enroll in pre-kindergarten, but that they were not enrolled. However, it is entirely possible that some of them were enrolled in a pre-kindergarten program outside the chosen district, but that they transferred in before beginning kindergarten. Available student data did not allow any determination of whether this was the case, or how much of an affect it might have had on the present study. To address this problem, it might be possible to gain access to statewide records under the Public Education Information Management System (PEIMS) for students who are included in the non-pre-kindergarten group, in order to verify their previous school enrollment status. Another alternative might be to select a random sample of students in the non-pre-kindergarten group, and attempt to collect data via some sort of parent interview or survey. Such a survey would not need to be exhaustive and involve every student and parent. Rather, it would likely be sufficient to select a

representative sample so that it could be gauged how many students in the non-pre-kindergarten group might have been erroneously placed there. The objective of such an analysis would be to verify that this particular problem was actually not that large – thus, reinforcing the conclusions of the main portion of the study.

Future research would benefit from including observations of classroom experiences in studies of pre-kindergarten programs so that hypotheses regarding classroom-level contributions to group differences, such as those found in this study, can be examined. Such observations need to include assessments of traditional curricular features and aspects of the classroom social climate – both of which might be found to make independent contributions to young children’s school readiness. Other pressing issues raised by this study concern whether the heterogeneous grouping of children in the classroom influences the successes of pre-kindergarten programs, the relative merits of stand-alone school-base, or collaborative programs, and the reasons for the lack of socioemotional outcomes attributable to the pre-kindergarten program.

Finally, an issue concerns the factors that affect whether a parent chooses to enroll their child in a pre-kindergarten program for which they are eligible. What are the factors addressing why *any* eligible students would not be enrolled in a pre-kindergarten program? This topic is well beyond the scope of the present study. However, it represents an important avenue for future research. Such a study could not be conducted as the present one was, via the use of archival student data. Instead, a systematic survey or series of interviews of parents and caregivers would need to be conducted.

## **Limitations**

The present study does suffer from a number of limitations that restrict the generalizability of any conclusions reached. The most obvious limitation is that the study was restricted to a very specific student group. More specifically, the study focused on economically disadvantaged, Hispanic ELL students from a single large urban school district in Texas. Limiting the study to this group had the advantage that it made the research investigation more manageable; yet, it limited the ability to extrapolate findings related to other socioeconomic or ethnic groups, or to other geographical regions of the United States. Further investigation would be required to verify the success of the HISD's pre-kindergarten programs with respect to other groups, such as non-Hispanic students or non-LEP students.

A second limitation was that the study involved only a single cohort of students, those who attended kindergarten during the 2007-2008 school year. A more intensive study utilizing data from cohorts across multiple years might have been preferable, but this would have required much more time and effort. In addition, the present study only looked at relatively short-term effects of pre-kindergarten participation, and used student performance data from 2010-2011 (i.e., when students should have been in third-grade). Although research into HISD's own pre-kindergarten programs has traditionally only looked at short-term effects, there exists a great deal of evidence in the literature that longer-term benefits can be observed (HISD, 2009; 2010; 2011). In an effort to identify additional effects of pre-kindergarten participation, a full investigation would need to examine data over a longer period of time.

Another limitation of the present study is that it represents an ex-post facto design, since students had been pre-assigned to the pre-kindergarten or non-pre-kindergarten groups by virtue of the fact that they either were or were not enrolled in a pre-kindergarten program in 2006-2007. There may have been many reasons why a student would not have attended pre-kindergarten, and any of these factors might have been related to subsequent student performance. To equate the pre-kindergarten and non-pre-kindergarten groups, random assignment of students to either condition would have been necessary, but this is not possible when dealing with real world data. The present study attempted to verify that students did not differ systematically at the outset, by comparing them on factors such as special education status, gifted and talented status, and by limiting the study to students with a specific set of demographic characteristics. However, there are likely many things about our student sample that we do not know, and any of these could have potentially influenced how students performed during later school years.

In a related vein, another limitation that does not appear to have a solution at present is the lack of knowledge concerning the status of students in the non-pre-kindergarten group. Specifically, students in the non-pre-kindergarten group were those who had been enrolled in kindergarten in 2007-2008, and were not enrolled at all in 2006-2007 according to district records. However, an unknown number of these students may have attended school elsewhere during 2006-2007; hence, meaning that they should not have been included in the non-pre-kindergarten group. This situation creates a difficult problem, but is perhaps not as important as it would be if the study showed no

differences between the pre-kindergarten and non-pre-kindergarten groups. Since there was, in fact, substantial evidence that the pre-kindergarten group performed better, the fact that we really had no explicit knowledge of the status of non-pre-kindergarten students during the 2006-2007 school year is an inconvenience rather than a major issue.

Furthermore, there are two additional limitations to the present findings. One major limitation involved is that many of the effects observed were statistically significant, yet very small. For example, there was less than a one percentage point difference between the pre-kindergarten and non-pre-kindergarten groups in overall school attendance rates. Similarly, the percentages of pre-kindergarten and non-pre-kindergarten students classified as either special education (1.9% vs. 3.4%) or as having been disciplined (1.4% vs. 3.1%) were all respectively very small in terms of absolute terms. Thus, it might be advisable to not attempt to read too much into these results.

Additionally, one area that the present study completely ignored is that of the relative performance of students who attended different types of pre-kindergarten programs. HISD's own evaluation reports on pre-kindergarten programs cover this issue quite extensively (HISD, 2008; 2009; 2010; 2011) but it was not addressed in the present study. Future studies might assess the impact of various models of pre-kindergarten programming and early grade indicators and outcomes. Models for evaluation of pre-kindergarten programs could be developed, ensuring the impact on a broad variety of indicators including but far beyond third grade test scores.

## Summary

Throughout the United States, there is a growing interest in pre-kindergarten programs that might enhance the school readiness of young children. The benefits of early education programs, and pre-kindergarten in particular, are well-documented. In recent years, evidence from evaluations of state pre-kindergarten programs demonstrate that children who have participated in such programs show better academic readiness skills (Lamy, Barnett, & Jung, 2005), as well as improved school attendance and performance, and reduced grade retention (Gilliam & Zigler, 2000).

The Houston Independent School District pre-kindergarten program offers an example of the success with which systematic, school-based initiatives can launch four-year-olds on a promising trajectory into elementary education. These effects were evident in full-day pre-kindergarten programs with Hispanic students that came from low-socioeconomic backgrounds and were classified as English language learners (ELLs). However, future research that employs a different testing instrument would be better suited to capturing the effects of pre-kindergarten across the full spectrum of students.

As with any major education decisions, and especially one that affects young children and their families, school leaders should work in close collaboration with communities, especially parents, Head Start, and other early childhood providers, in order to develop programs that best meet the community's needs.

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## APPENDICES

APPENDIX A  
SPANISH TAKS READING SCALE SCORE ANALYSIS

### Appendix A: Spanish TAKS Reading Scale Score Analysis

Group Statistics

	Group	N	Mean	Std Deviation	Std Error Mean
Reading Scale Score	NPK	539	630.53	97.463	4.198
	PK	2,816	641.81	98.629	1.859

Independent Samples t-test

t	df	Sig (2- tailed)	Mean Difference	Std Error of Difference	95% Confidence Interval of the Difference	
-2.438	3,353	.015	-11.282	4.628	-20.357	-2.208

APPENDIX B  
SPANISH TAKS MATHEMATICS SCALE SCORE ANALYSIS



## Appendix B: Spanish TAKS Mathematics Scale Score Analysis

Group Statistics

	Group	N	Mean	Std Deviation	Std Error Mean
Math Scale Score	NPK	539	604.72	105.237	4.533
	PK	2,799	619.95	109.860	2.077

Independent Samples t-test

t	df	Sig (2- tailed)	Mean Difference	Std Error of Difference	95% Confidence Interval of the Difference	
-2.966	3,336	.003	-15.224	5.133	-25.288	-5.160

APPENDIX C  
ENGLISH TAKS READING SCALE SCORE ANALYSIS

### Appendix C: English TAKS Reading Scale Score Analysis

Group Statistics

	Group	N	Mean	Std Deviation	Std Error Mean
Reading Scale Score	NPK	92	600.47	116.772	12.174
	PK	678	599.09	105.187	4.040

Independent Samples t-test

t	df	Sig (2- tailed)	Mean Difference	Std Error of Difference	95% Confidence Interval of the Difference	
0.116	768	.908	1.373	11.847	-21.883	24.629

APPENDIX D  
ENGLISH TAKS MATHEMATICS SCALE SCORE ANALYSIS

### Appendix D: English TAKS Mathematics Scale Score Analysis

Group Statistics

	Group	N	Mean	Std Deviation	Std Error Mean
Math Scale Score	NPK	92	590.30	86.522	9.021
	PK	694	600.30	94.157	3.574

Independent Samples t-test

t	df	Sig (2-tailed)	Mean Difference	Std Error of Difference	95% Confidence Interval of the Difference	
-0.966	784	.334	-10.000	10.352	-30.321	10.322

APPENDIX E  
STUDENT ATTENDANCE PERCENTAGE ANALYSIS

### Appendix E: Student Attendance Percentage Analysis

Group Statistics

	Group	N	Mean	Std Deviation	Std Error Mean
Attendance Percentage	NPK	763	97.841854	2.7267006	.0987132
	PK	3,868	98.508302	2.1150165	.0340072

Independent Samples t-test

t	df	Sig (2- tailed)	Mean Difference	Std Error of Difference	95% Confidence Interval of the Difference	
-7.554	4,629	.000	-.6664476	.0882284	-.8394173	-.4934778

APPENDIX F  
HISD APPROVAL TO CONDUCT RESEARCH



