

Evaluation of Structured English Immersion and Bilingual Education on the
Reading Skills of Limited English Proficient Students in California and
Texas

by
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Abstract

The purpose of this study is to compare the effectiveness of the structured English immersion program and the bilingual education program on the reading performance of limited English proficient students. The sample of this study is comprised of fourth grade Hispanic Spanish-speaking Limited English Proficiency (LEP) students from six campuses in southern California and six campuses in southern Texas who participated in the 2005 Reading National Assessment of Educational Progress. To determine the impact of these English language acquisition programs on these students' reading skills, a multiple regression analysis was conducted. After controlling for several factors, results of the analysis show that neither structured English immersion nor bilingual education had a significantly greater impact on the reading skills of LEP students. When deciding which program to implement, educators and policymakers may want to compare costs associated with each and determine the priority that a community places on maintaining a student's native language.

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Chapter I: Introduction

Education of Limited English Proficient Students

Juan Gonzalez¹ grew up in an environment where he felt comfortable and secure, living near people who spoke the same language, participated in similar cultural activities, and faced similar economic conditions. When Juan and his family moved to the United States from Mexico in search of a better life, he felt isolated from many of the children in his new school. Not only was there a language barrier that was difficult to break, but the culture and level of academic rigor was much different than what he was used to. Interaction with teachers and other students at his elementary school was hindered as he struggled to learn English. The appropriate instructional tools were not in place to help Juan develop both linguistically and academically. Eventually he began to believe that school was not for him. After struggling academically for several years, Juan dropped out of school in the tenth grade. The better life he and his family had hoped to obtain by coming to the United States was now farther from his grasp.

Depending on where immigrant families settle in the United States, they can experience an array of situations that have an impact on their integration into society. One of the most important factors that contribute to foreign-born students' success, and ultimately their attainment of a good job, is proficiency in the English language. Therefore, it is important to ensure that schools put in place appropriate educational programs to help these students achieve academic success before they are left behind.

¹Note composite student that does not represent an actual child.

Education of today's youth is an important task for public administrators, and it is often the topic of much debate. Educators and policymakers debate which strategies are best for teaching specific subgroups of students and which programs yield the best results for students' academic and social development. One of the most eminent concerns in the academic arena is the education of Hispanic limited English proficient (LEP) students.

As Fashola et al. (1997, 2) state:

There is a crisis in the education of Latino students, and this crisis is not fully explained by recent immigration status or even limited English proficiency...there are many islands of excellence among schools serving many Latino children, but far too many of these children are placed at risk by schools and community institutions unable to build on the cultural, personal, and linguistic strengths these children are likely to bring with them to school.

Most often these students are immigrants, though sometimes they are native to the United States. In 2003 there were 38.8 million Hispanics in America (Perez 2004). In 2000, nearly half of the Latinos in America were under 25 years old (United States Census Bureau 2000). The population of immigrants into the U.S. consists in large part of children: between 1990 and 2001, the number of children in immigrant families who were eligible to enroll in school rose seven times more than the number of school-eligible native U.S. children (Schmid 2001).

“Both the size of the Latino population and its youthfulness mean that the well-being of the Hispanic community—and especially of Latino children—matters to the future economic and social status of the United States as a whole” (Perez 2004, 122). Hispanic children, however, are not as likely as other children to be in preschool programs or to graduate from high school (Perez 2004). Hispanics are less likely to go to college, which will affect their professional achievement and ultimately affect the extent that the Hispanic group overall will succeed in adulthood (Fuligni and Hardway 2004).

With the implementation of the No Child Left Behind Act (NCLB), states are facing strict requirements to ensure all children perform at a high academic achievement level. States with growing Hispanic populations must quickly develop strategies to facilitate academic development for the increasing numbers of LEP students in their schools (Perez 2004). While there is evidence that distinctive programs can lead to academic success for LEP students, no one particular program can be assumed to be more beneficial (Baker and de Kanter 1983).

Texas and California, two large states with significant Hispanic immigrant populations, have different approaches to educating children with limited English proficiency. Texas uses bilingual education and California uses structured English immersion. Which program is better?

Research Purpose

The purpose of this study is to compare the effectiveness of the structured English immersion (SEI) program in southern California and the bilingual education (BE) program in southern Texas on the reading performance of fourth grade Hispanic Spanish-speaking limited English proficient (LEP) students.

Report Organization

Chapter Two provides a historical overview of educational legislation and its impact on limited English proficient students, and then reviews the literature related to bilingual education programs, immersion programs, and factors that contribute to success in school. Arguments for and against bilingual education and immersion programs are

provided. In addition, a hypothesis is developed specifying the relationship between each program type and outcomes on reading skills. The conceptual framework for analysis is presented and discussed. Chapter Three (Setting) describes student demographics, current policy on educational programs for limited English proficient (LEP) students, and an overview of the academic achievement of LEP students in each state. Chapter Four operationalizes the hypothesis and describes the methodology developed to address the research question. Existing National Assessment of Educational Progress (NAEP) data are used to measure the impact of the bilingual education program and the structured English immersion program on the reading skills of LEP students. Chapter Five discusses and interprets the results of the regression analysis. Chapter Six provides a summary of the findings, strengths and weaknesses in the data used, and possibilities for future research in this area.

Chapter II: Literature Review

Chapter Purpose

The purpose of this chapter is to examine and review the scholarly literature on factors that contribute to success in school. More specifically the scholarly literature review first contains information on the history of federal legislation and major Supreme Court decisions that are directed at assisting students to attain high levels of academic excellence. Second, the literature review examines supporting and opposing arguments for bilingual education and immersion programs that assist LEP students acquire the necessary skills to achieve academic success. Third, a description of factors that contribute to success in school overall is developed. Finally, the hypothesis used to evaluate the effectiveness of bilingual and immersion programs is developed.²

Historical Overview

For the purpose of this study, the No Child Left Behind (NCLB) definition of a LEP student is used, because the majority of school districts who have LEP students receive funding from NCLB and identify students based on these criteria. In the No Child Left Behind Act, the United States (USDE 2002b) government uses the following criteria to define students who are of limited English proficiency:

(A) aged 3 through 21;

² For additional Texas State Applied Research Projects dealing with education issues, see Good (2007); McCauley (2007); Vaden (2007); Alston (2006); Bell (2006); Castleberry (2006); Hood (2005); Sallee (2005); Jones (2004); McKinnerney (2004); Palacios (2003); Armstrong (2002); Cruz (2002); Musfeldt (2002); Cordova (2001); Garza (2001); Gonzales (2001); Perez (2000); Pratt (2000); Gute (1999); Luedtke (1999); Durham (1995); Rhoades (1995); Autrey (1994); Goldapp (1993); Michie (1993); Corley (1992); Deming (1992); Mohajer (1992).

- (B) enrolled or preparing to enroll in an elementary school or secondary school;
- (C)(i) not born in the United States or whose native language is a language other than English;
- (ii) (I) is a Native American or Alaska Native, or native resident of the outlying areas; and
- (II) comes from an environment where a language other than English has had a significant impact on the individual's level of English language proficiency; or
- (iii) is migratory, whose native language is a language other than English, and who comes from an environment where a language other than English is dominant; and
- (D) whose difficulties in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual
 - (i) the ability to meet the State's proficient level of achievement on State assessments described in section 111(b) (3);
 - (ii) the ability to successfully achieve in classrooms where the language of instruction is in English; or
 - (iii) the opportunity to participate fully in society.

In addition, Adedi (2004, 7) states that,

Among the most important criteria for identifying LEP students are being speaker of a language other than English and scoring low on the English proficiency tests. The first criterion i.e., being a nonnative English speaker is defined in many areas nationwide based on the information from the Home Language Survey. The second criterion, student's proficiency in English, is obtained based on scores on English proficiency tests and achievement tests.

Special Circumstances of Limited English Proficient Students

When looking at programs for limited English proficient (LEP) students, it is necessary to examine the special circumstances that these students face. There may be many differences in English language proficiency; primary language literacy, writing and reading ability; and home literacy practices of LEP students. Many immigrant students come to America with some prior schooling, although the majority are already a few years behind academically (Olsen 1988).

A strong academic foundation in a student's native language can facilitate learning English (Padilla and Gonzalez 2001). According to Peregoy and Boyle (2000, 237), "Of all school learning, success in literacy, especially reading, is certainly among the most important achievements for all students due to its key role in academic learning and consequent social and economic opportunities." If a child is familiar with books, written words and reading in Spanish, she will have an easier time learning English. Many LEP students, however, are not exposed to school or basic academic skills at all. This limits academic and linguistic development (Padilla and Gonzalez 2001). In addition, the extra barrier of learning a new language adds both linguistic and academic challenges to achieving grade level performance and increases the LEP students' risk of dropping out of school.

Other characteristics of LEP students can also exacerbate or mitigate the influence of limited English proficiency on performance in school. These characteristics include country of birth, age of the person when they immigrated into the U.S., rigor of the school they attended in their native country, English language instruction, Spanish language proficiency, parent's education level, ethnic make-up of their current school,

and difficulty of the coursework that the student is taking (Padilla and Gonzalez 2001; Gibson and Ogbu 1991).

Prior to the 1960s, the federal government traditionally had not been involved in education. Decisions about the best approaches to educating LEP students were left up to state and local governments (Rosenbaum 1981). “The Elementary and Secondary Education Act (ESEA) of 1965...mandated the first direct federal assistance program for elementary and secondary schools....” (Rosenbaum 1981, 442). Following this significant piece of legislation was the Title VII Bilingual Education Act, *Lau v. Nichols*, Improving America’s Schools Act, and the No Child Left Behind Act. A brief description of each follows.

Elementary and Secondary Education Act of 1965

President Lyndon B. Johnson designed the first legislation to completely reform the educational system in the United States. The Elementary and Secondary Education Act of 1965 (ESEA) increased focus on educational programs for low-income and underrepresented students (The University of Texas LBJ Library and Museum). The ESEA encouraged supplementary instruction, emphasizing math and reading, and an assortment of support services to help low-income children overcome the consequences of these conditions (Branz-Spall et al. 2003).

As a part of this reform, federal legislation was expanded in many areas to acknowledge the rights of immigrants, including educational attainment and acquisition of the English language. According to Rosenbaum (1981), a 1967 Senate report indicated that Congress felt there was a direct relationship between low educational

achievement, limited language proficiency, and poverty that had not been addressed in the original version of the ESEA (see Senate Report No. 726, *U.S. Code Cong. and Admin. News* 2780). Therefore, in 1967 the ESEA was amended to include the Title VII Bilingual Education Act.

Title VII Bilingual Education Act

The Bilingual Education Act focused on increasing the academic success of English language learners (ELLs) in schools by developing new strategies for bilingual education programs, collecting data on the services provided to limited English proficient students, evaluating bilingual education program effectiveness, and providing public schools with the results (USDE 1994, *sec. 7102*). The development of specific second-language strategies was left up to state and local governments (Rosenbaum 1981). The Act did not mandate that schools use the students' primary language in instruction (Lucas and Katz 1994), though it did encourage it (Rosenbaum 1981).

According to Danoff (1978), the overall analysis of Title VII showed that the emphasis on bilingual education was not having a significant effect on student achievement. In 1984 Title VII was redesigned to become less of a supplementary language program and instead focus more on students' academic skills while also developing their language skills (Lucas and Katz 1994). In addition, Special Alternative Instructional Programs (SAIPs), that provided instruction to English language learners only in English, were included in the reauthorization. It was thought that bilingual education programs may not be appropriate in schools where students spoke many different languages, and also that there was not a sufficient number of qualified bilingual

teachers available to provide programs for all language-minority students (Lucas and Katz 1994).

Lau v. Nichols (1974)

The Supreme Court decided in *Lau v. Nichols* (1974) that placing LEP students into English-speaking classrooms failed to meet the equal education standards. The Supreme Court offered the opinion that “remedies [would be] left to local discretion,” noting that bilingual education and English as a Second Language (ESL) programs, among others, were options (McGroarty 1992, 7). *Lau v. Nichols* was the first case to establish specific guidelines to address LEP students’ needs and mandate that these guidelines be implemented within a set timeframe (Lucas and Katz 1994).

Around this time, the issue of language instruction in schools became a central political debate. During the 1980s, several constitutional amendments were introduced in the U.S. Congress to make English the national language (Davila and Mora 2000). While none of these amendments were passed by the U.S. Congress, many states at the time did pass “English only” legislation, indicating voters’ increasing intolerance of linguistic pluralism (Davila and Mora 2000). Latin American immigrant workers who came into the United States in the later part of the 1980s appeared to have higher levels of English fluency after five years than similar immigrant workers who came into the United States in the late 1970s (Davila and Mora 2000), suggesting that later immigrants were responding to the newly increased pressure to become proficient in English.

Improving America's Schools Act of 1994

In 1994, President Bill Clinton developed the Improving America's Schools Act (IASA), which reauthorized the Elementary and Secondary Education Act and expanded the role that the government would take in the development of educational programs and strategies. The United States Department of Education (1997, 3) reported that IASA “fundamentally reformed Title I—a \$7 billion program for teaching basic and advanced skills in high poverty schools—to get rid of lower educational expectations for poor children and ensure that disadvantaged students are held to the same standards of other children...” The IASA reform for LEP students focused on systematic change and improvement of current educational programs, development of bilingual skills and understanding other cultures, and the improvement of professional development training provided to teachers who work with LEP students (USDE 1994).

No Child Left Behind Act of 2001

In 2001 President George W. Bush implemented the No Child Left Behind Act (NCLB), which established “challenging standards in reading and mathematics and develop[ed] statewide annual adequate yearly progress (AYP) objectives...[which] must be met by all groups of students, disaggregated by poverty, race and ethnicity, disability, and limited English proficiency” (USDE 2004, 1). Under Title III of NCLB, LEP students are required to “attain English proficiency, develop high levels of academic attainment in English, and meet the same academic achievement standards as all children are expected to meet” (USDE 2002, 40). In addition, NCLB added increased funding and development of educational strategies for LEP students in order to encourage the

participation of parents and community members, hold local education agencies (LEAs) accountable by requiring that programs demonstrate improvement in English proficiency and overall academic achievement, and allow flexibility to states in the use of these funds, as long as strategies are scientifically research based (TEA 2005c). This flexibility has led to states adopting educational approaches that they feel best fit their language-minority population.

Educational Programs for Limited English Proficient Students

Two approaches to teaching Spanish-speaking limited English proficient (LEP) students are bilingual education and English immersion. A discussion of each program's characteristics and arguments for and against each are provided in the following section.

Bilingual Education Programs

According to the National Association of Bilingual Education (2004), bilingual education “refers to approaches in the classroom that use the native languages of English language learners (ELLs) for instruction.” The approaches of BE are classified as *transitional* (uses the primary language in core academic subject areas and slowly moves into English), *developmental* (uses the primary language and the English language in instruction), or *two-way bilingual* (non-native-English speaking and native English-speaking students are placed in the same classroom to fully develop both languages) (USDE 2007a). BE programs may differ across instructional settings. For example, for some students the all-English transition is quick (between one and three years), and sometimes it is more gradual (between five and six years) (NABE 2004).

Most supporters of bilingual education programs claim that the main benefit is that the student will actually become fluently bilingual in both languages, which has been associated with increased academic achievement (Safty 1988). Using insights from a review of the literature, Schmid (2001) theorized that students who are fluently bilingual will perform academically better than those students who are not. For example, Zhou and Bankston (1998) found that Vietnamese children in New Orleans who had both strong native language and English proficiency attained higher grades. Also, McMillen et al. (1997) found almost equal high school completion rates of bilingual students (fluent in both their native language and English) for those whose home language was English (17.5%) and those whose home language was Spanish (20.3%).

Another argument for bilingual education programs is that the approach helps students overall, regardless of whether or not they develop fluency in both languages. Willig (1985) determined, in a follow-up study to Baker and de Kanter (1983; see more description in the following paragraph), that students who participated in bilingual education programs continually scored higher than students in other LEP programs on math, language skills, reading, and overall achievement tests given in English; and social studies, writing, math, language skills, reading, writing, and listening skills tests given in their native language.

Opponents of BE programs claim that there are considerable costs but limited long-term data available on the effects of bilingual education (August and Hakuta 1997; Cziko 1992). After reviewing 28 studies on BE programs using controls consisting of the original study group plus a comparison group of students participating in nonbilingual programs, Baker and de Kanter (1983) determined that there is no conclusive evidence on

the effectiveness of these programs. Their conclusions were based on the findings that children participating in BE did not achieve as much academically as other English speaking students, including educational attainment of reading and math skills, and that it took longer than total immersion programs to acquire a proficient level of English (Baker and de Kanter 1983).

BE programs are closely linked with ESL programs, as “English instruction is a component of bilingual education” (NABE 2004). ESL programs in the U.S. typically provide English instruction for 45-55 minutes per day (Faltis and Arias 1993). The ultimate long-term goal of these programs is to develop dual language abilities, though there is an in-between time when students are only somewhat proficient in two languages.

English Immersion Programs

Another type of English language development program is immersion. “The goal of immersion is to prepare students for life in an increasingly interdependent world that is ethnically and linguistically diverse” (Thomas et al. 1993, 170). Immersion programs are usually implemented for students through grade eight (Genesee 1985) and can differ in the amount of instruction in the second language. *Total immersion* (often associated with the term *structured English immersion*) refers to the entire or nearly entire instruction provided in the second language, while *partial immersion* refers to roughly half of instruction provided in the primary language and half provided in the secondary language (Genesee 1985).

The first second-language immersion courses were developed in Canada in 1965. In a community where French was increasingly becoming the majority language, a group

of parents of English-speaking students in Quebec expressed concerns that French as a second language programs were not sufficient for their children. The parents thought that these programs would not provide their children with the necessary language skills in order to succeed and function in the community (Lambert and Tucker 1972). Thomas et al. (1993, 171) describes these programs:

The term 'total immersion' is used in Canada to refer to starting the immersion experience with all instruction in the minority language. Then, after one to three years, the majority language is gradually introduced as a language of instruction until the two languages are each used for fifty percent of the instruction.

In the Canadian immersion programs, teachers speak only in the target language around students, even though a majority of them are bilingual. This is to encourage students to learn to use the language. Students are not required to use the new language with their peers or the teacher during the first couple months of enrollment (Genesee 1985).

Supporters claim that immersion programs are more effective than BE programs in developing the secondary language. For example, studies have found Canada's immersion program to be effective in second language instruction (Genesee 1985; Lambert and Tucker 1972; Swain and Lapkin 1981). Genesee (1985) finds that immersion programs create an instructional environment that coincides with student's learning about their community, school subjects, one another, and the world overall. Genesee (1985) speculates that immersion students are engaged in more interesting content than basic grammar and respond positively to this by developing language proficiency.

Opponents of immersion programs claim that LEP students are likely to fall behind in their academic growth while the immediate focus is on English language development (Lucas and Katz 1994). Immersion attempts to put the student in a learning

environment that is as close as possible to the natural setting in which the initial language was acquired; however, according to Safty, French immersion students are “plunged into a French environment from the first school day, immersed in linguistic waters and expected to sink or swim” (Safty 1988, 245).

Other opponents are concerned with losing the primary language while developing the second. For example, Swain and Lapkin (1989) believe that the context of the instruction in the Canadian immersion programs was very different than what is often thought of as a traditional “immersion” program today. They argue that French immersion in Canada is very different than English immersion in the U.S. because Canadians immersed students in a minority language, whereas these programs in the U.S. attempt to immerse students in the majority language. The authors claim that “while a likely outcome of immersing a majority language child in a minority language in school is a bilingual individual, a likely outcome of immersing a minority language child in a majority language in school is a unilingual individual (150).” Philips (2003, 583) echoes this sentiment: “As this school generation grows up—and depending upon which nation is our competitor or enemy—we will be wondering where all the proficient speakers have gone in languages neither taught nor maintained in the schools.”

Factors Related to Success in School for Students

There are many factors beyond a student’s drive and willingness to succeed that contribute to academic success in school. The literature reveals that the most common factors are ethnicity, gender, socioeconomic status (SES), primary language spoken at home, and length of time in an English language program. These factors should be

controlled in a program evaluation that assesses differences in reading abilities in students participating in programs designed to help students with limited English proficiency. These factors offer potential alternative explanations to observed differences in program outcomes.

Ethnicity

Ethnicity is one of the most important and frequently used controls in program evaluation studies on factors related to success in school. The effect of ethnicity overall is inconsistent and varies among ethnic groups. For example, studies show that children of Mexican immigrants do consistently poorer. People offer various explanations for the lack of success in schools of Mexican American students, including a belief that the culture may not place a high value on learning, and other barriers, such as limited English proficiency, poverty, discrimination (Gibson and Ogbu 1991). Hence, studies that examine differences in education among LEP students must take into account the ethnicity of the group and control appropriately.³

However, Schmid (2001, 74) found that when all the factors contributing to the possibility of a student dropping out of school (inability to speak English, low SES, lack of family support) “are controlled among racial and ethnic groups, no difference is found in the dropout rates of Latinos and other groups.” The quandary is that these at-risk factors seem to be more present in immigrant students who are of Latino decent. Children of immigrant parents more often will live in poverty (Shields and Behrman 2004). In particular, people emigrating from the Caribbean, Central America, Asia, and

³ See for example Duncan and Magnuson 2005; Fejgin 1995; Fuligni 1997.

Mexico who do not have strong English skills tend to have fewer educational skills and job opportunities (Shields and Behrman 2004). Children in immigrant families “often share the same hardships experienced by other children from [other] low-income families, [though] what is needed to help them overcome these hardships requires a greater understanding of” their unique circumstances (Shields and Behrman 2004, 4). In fact, the difference in SES of native students and Latino immigrants has been linked to the variation in grades and test scores between these two groups (Kao and Tienda 1998).

Gender

Gender is another factor commonly controlled for in studies that gauge academic success. Often there is a significant difference in the manner in which males and females learn, and it can be a significant factor in predicting both success in school and acquisition of language proficiency (Portes and Hao 1998). For example, Portes and Hao (1998) found that male students whose parents are immigrants are less likely than demographically similar female students to become fluent in both their primary language and English. In addition, Schmid (2001) found through a meta review of studies on students from immigrant families that females outperformed males in both urban (see Rumberger and Larson 1998) and rural (see Gibson 1998) school districts in California.

Socioeconomic Status

Socioeconomic status (SES) should be controlled for in a program evaluation study on education because it can have an impact on a student’s likelihood of academic success or risk of dropping out of school. A child’s social and economic status plays a

significant role in his or her development. In particular, low SES has been linked with academic failure, poor health, teenage pregnancy, and drug use, along with other social risks (Perez 2004). Rumberger (1995) found that SES is highly correlated with whether or not a student stays in school.

The National Center for Education Statistics (NCES) (USDE 2007b) defines socioeconomic status as “a measure of an individual or family’s relative economic and social ranking.” Social ranking is constructed based on mother’s education level, father’s education level, mother’s occupation, and father’s occupation (USDE 2007b). Evidence suggests that parents’ education level and occupation choice influence the emphasis that they place on education for their children. Therefore, for the purpose of this study, socioeconomic status is measured in terms of family emphasis on education and economic status.

A child’s lack of educational achievement is partially limited by a lack of parental support and emphasis on academics (USDE 2001; Fuligni 1997). Some ways that parents can emphasize education is to talk to their children about what they are learning in school, provide educational books or other resources at home, and set expectations for high academic achievement. Hernandez (2004) and Shields and Behrman (2004) have found that the less education a parent has, the less likely they are to assist with homework and the less-informed they are about how to help their children gain access to college.

The effect of parent education levels may also explain the discrepancy in academic performance by children of minority parents. For example, the 1998 Early Childhood Longitudinal Study (ECLS-K) collected data on children’s characteristics and their successes, with one specific area focusing on hardships that children face when

growing up, such as residential instability and being born to teen parents. Duncan and Magnuson (2005) found that the incidence of failure to complete high school was highest among Hispanic mothers (35%) as compared with black (18%) and white (7%) mothers. In addition, the ECLS-K study found that Hispanic children often had fewer children's books at home than other children (Duncan and Magnuson 2005), suggesting a lack of supplemental instructional time.

In addition to the lower level of parent's education for minority children in general, immigrants more often have not completed high school. "Among all children with U.S.-born parents, 12% have mothers, and 12% have fathers, who are not high school graduates. In contrast, among children with foreign-born parents, 23% have mothers, and 40% have fathers, who are not high school graduates" (Shields and Behrman 2001, 6). Padilla and Gonzalez (2001) found support for Shields and Behrman's conclusions in a study to determine the possible benefits of bilingual/ESL programs in various school contexts. Through a survey of 2,167 ninth through twelfth grade students of Mexican descent, they found that 34.4% of mothers and 48.1% of fathers born in the U.S. had at least a little college education, compared to 15.4% of mothers and 15.2% of fathers born in Mexico. These findings are troubling because more than 5 million of the children in the United States have immigrant parents from Mexico (Shields and Behrman 2004).

In addition, the higher the education of the parents, the more likely it is that they will have better jobs and higher incomes, which can also positively impact student academic success (Duncan and Magnuson 2005, Hernandez 2004). Students whose families had incomes in the lower 20 percent of the community distribution were six

times more likely than students whose families had incomes in the top 20 percent of the community to not finish high school (USDE 2002a, v).

Primary Language Spoken at Home

The primary language that a student speaks at home is a necessary control in an impact evaluation study on language acquisition programs. Exposure to others speaking English may allow for enhanced school success and language acquisition (Hannah 2003). Nevertheless, Spanish-speaking LEP students tend to enroll in schools with high numbers of minority, low-income, and LEP children more often than non-Spanish speaking LEP students (Van Hook and Balistreri 2002). For example, in Padilla and Gonzalez's (2001) study of the various regions that students lived in (urban, rural, border town, etc.), 44.5% of students who only spoke English at home and school attended an urban high school, 42.2% attended a rural high school, and only 13.3% were enrolled in a U.S.-Mexico border high school, signifying that the language spoken at home and the community that the student resides in are linked. The schools along the border were mostly populated with students who did not speak English at home.

Living in a community where there are shared cultural elements, including language, can be positive for students. Shields and Behrman (2004, 6) find that:

When immigrant families arrive in America, they often settle in communities with others from their same country of origin...the role of a cohesive, culturally-consonant community can make a critical difference in helping youth maintain positive aspirations despite the challenges they face as newcomers to this country.

While speaking two languages might have potential benefits, if none of the family members in the household speak English well then the parents are more likely to have difficulty communicating with teachers, obtaining higher wage employment, and

accessing social services such as healthcare (Shields and Behrman 2004). These are all factors that contribute to the eventual success of their children.

Length of Time Student has Participated in an English Language Program

Impacts from language acquisition programs vary at different periods in a student's language development. Data from early stages of Gersten and Woodward's (1995) study of one school district's English language programs indicated that one program had a larger effect on students' academic achievement than the other program. This finding suggests that one group of students was developing their English language ability more than the other group, and was therefore able to perform better on the academic assessment. However, at the end of the longitudinal evaluation (following students from first through seventh grade), it was determined that there was not a significant difference between the two programs on the assessment. It is expected that there may be "...large increases in English-language achievement test scores for students during their first two years of English-language instruction..." then students eventually reach a plateau (Gersten and Woodward 1995, 235). This can partly be explained by students gaining familiarity with the way questions are asked and the specific vocabulary used (Gersten and Woodward 1995; Baker & de Kanter 1983; Cziko 1992).

Conceptual Framework

This section describes the conceptual framework of the program evaluation study. The goal of this research is explanatory and the conceptual framework utilized is formal hypothesis. "From a [Public Administration] perspective, explanatory research is

important because all impact oriented program evaluation is explanatory. All impact program evaluations use formal hypothesis” (Shields 1998, 217).

Before evaluating the impact of educational programs, it is necessary to examine factors contributing to student success in school. These factors should be controlled in a program evaluation that determines differences in reading skills of students participating in programs designed to increase English language proficiency. These factors offer potential alternative explanations to observed differences in program outcomes.

Hypothesis 1 (H₁) addresses how the controls are linked to the impact evaluation of BE and SEI programs.

Controlling for these variables, the study will evaluate the impact of the structured English immersion (SEI) and bilingual education (BE) programs on the 2005 Reading National Assessment of Educational Progress (NAEP) scores of fourth grade Hispanic Spanish-speaking LEP students. SEI programs immerse students in English at a faster rate than BE programs. For that reason, it is the assumption for the purposes of this study that students participating in SEI will have a better grasp of both English and the reading academic content area. Therefore,

H₁: Controlling for ethnicity, gender, socioeconomic status, primary language spoken at home, and length of time student has participated in an English language program, Hispanic Spanish-speaking limited English proficient students participating in structured English immersion will score higher on the Reading NAEP than Hispanic Spanish-speaking limited English proficient students participating in bilingual education.

The hypothesis is summarized and linked to the supporting literature in Table 2.1.

Table 2.1
Conceptual Framework for Determining the Impact of
Structured English Immersion and Bilingual Education Programs

Formal Hypothesis	Scholarly Support
<p>H₁: Controlling for ethnicity, gender, socioeconomic status, primary language spoken at home, and length of time student has participated in an English language program, Hispanic Spanish-speaking limited English proficient students participating in structured English immersion will score higher on the Reading NAEP than Hispanic Spanish-speaking limited English proficient students participating in bilingual education.</p>	<p>August & Hakuta 1997; Baker & de Kanter 1981; Cziko 1992; Faltis & Arias 1993; Genesee 1985; Lambert & Tucker 1972; Lucas & Katz 1994; McMillen et al. 1997; NABE 2004; Philips 2003; Safty 1988; Schmid 2001; Swain & Lapkin 1989; Thomas et al. 1993; USDE 2007a; Willig 1985; Zhou & Bankston 1998</p>

Chapter Summary

The purpose of this study is to compare the effectiveness of the structured English immersion (SEI) program in southern California and the bilingual education (BE) program in southern Texas on the reading performance of fourth grade Hispanic Spanish-speaking LEP students. Prior to conducting an evaluation of educational language acquisition programs, it is necessary to control for ethnicity, gender, socioeconomic status, primary language spoken at home, and length of time in an English language program. Hypothesis 1 (H₁) illustrates how the controls are linked to the impact evaluation of BE and SEI programs.

Chapter III: Setting

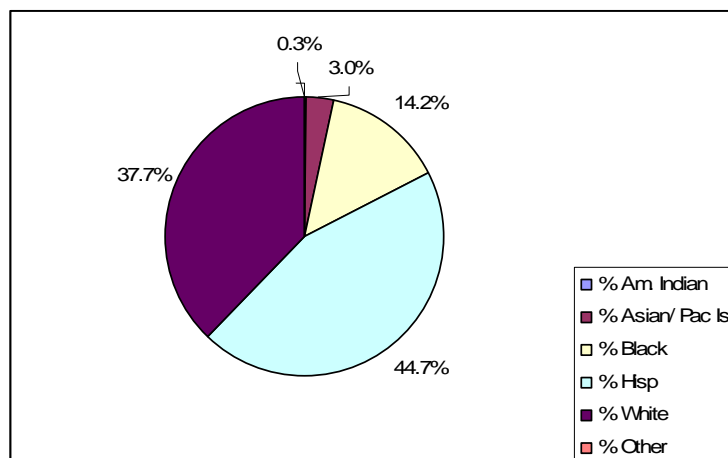
Chapter Purpose

The purpose of this chapter is to provide information on the educational setting in Texas and California. Specifically it focuses on student demographics and current policy on educational programs for limited English proficient (LEP) students, and provides an overview of the academic achievement of LEP students in each state.

Educational Setting in Texas

In the 2004-05 school year, there were close to four and a half million students enrolled in Texas schools (USDE 2006a, 1). As shown in Figure 3.1, Hispanics (44.7%) make up the largest ethnic group of Texas' school-age population enrolled in prekindergarten through twelfth grade.⁴ Whites (37.7%) are the next largest group of enrolled PK-12 students, followed by Blacks (14.2%).

Figure 3.1
2004-05 Texas Distribution of Students Enrolled in PK-12 by Ethnicity



Source: NCES, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education", 2004-05 v.1c

⁴ A comparison of Texas, California, and national demographic data is presented in Appendix A.

In 2003-04 (most current data available), there were 111,423 (2.5%) migrant students in Texas (USDE 2006a). During the 2004-05 school year, 54.6% of students in Texas were eligible for free or reduced price lunch (TEA 2006a) and 684,007 (15.6%) were classified as limited English proficient (LEP) (TEA 2006a). In addition, there were 18,290 (0.9%) dropouts⁵ in grades 7-12 in Texas during the 2004-05 school year (TEA 2006b).

In 2004, 69.4% of LEP students were enrolled in elementary school (K-6) (TEA 2006d). According to the 2000 U.S. Census, 32.4% of Texas students ages 5-17 spoke a language other than English in their homes, and 90.8% of those students list Spanish as their primary language. Fifteen percent of students whose primary language at home was Spanish spoke English "not well" or "not at all" (U.S. Census 2000).

Texas LEP Educational Policy

Texas Education Code (TEC) §29.052 defines a LEP student as “a student whose primary language is other than English and whose English language skills are such that the student has difficulty performing ordinary classwork in English.” The English Language Proficiency (ELP) standards are a part of the state-mandated curriculum in Texas and are designed to ensure students have an adequate chance to achieve academically by incorporating English language development into all subject areas (TEA

⁵ Prior to the 2005-06 school year, the Texas Education Agency (2006b) defined dropout as “A student who left school during the school year without an approved excuse or completed the school year and (a) did not graduate; or (b) did not return to school the following year.” Under this definition, students who entered a private school, college, or home school; and students who met requirements for graduation but did not meet the passing standard on the exit-level state level assessment (Texas Assessment of Knowledge and Skills (TAKS)) were not considered a dropout. In addition, students who dropped out of school but obtained a certificate for General Educational Development (GED) were not counted as dropouts for accountability reasons. Beginning with the 2005-06 school year, TEA (2006b) will use the National Center of Education Statistics’ (NCES) definition of dropout. See http://www.tea.state.tx.us/research/pdfs/2006_comp_annual.pdf, page 73.

2006c). Texas currently has a policy that all LEP students must be taught using bilingual or English as a second language (ESL) strategies as an integrated part of the curriculum (TEC §29.051). The law states that the reason for this is because “experience has shown that public school classes in which instruction is given only in English are often inadequate for the education of those students” (TEC §29.051).

According to Texas Administrative Code (TAC) §89.1205, “each school district which has an enrollment of 20 or more limited English proficient students in any language classification in the same grade level district-wide shall offer a bilingual education program; all limited English proficient students for whom a district is not required to offer a bilingual education program shall be provided an English as a second language program” (TEA 2005b). The TAC §89.1210 (TEA 2005b) further mandates that these programs be developed as follows:

Students participating in the bilingual education program may demonstrate their mastery of the essential knowledge and skills in either their home language or in English for each content area...it shall be a full-time program of instruction in which both the students’ home language and English shall be used in instruction; English as a second language strategies, which may involve the use of the students’ home language, may be provided in any of the courses or electives required for promotion or graduation.

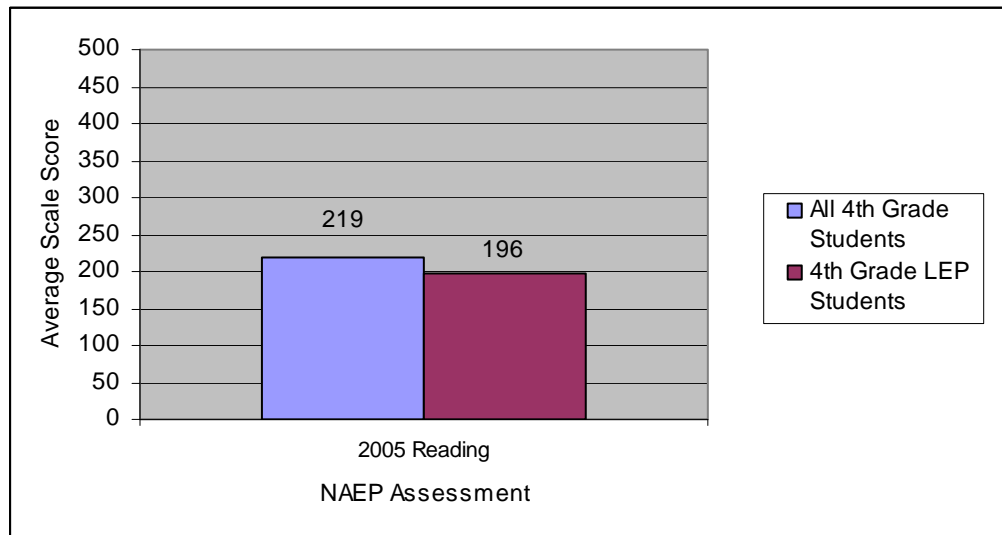
In the 2004-05 school year, 92% of LEP students participated in Bilingual/ ESL instruction, while the remaining students participated in other types of English language instruction or no specific language program at all (TEA 2006a).

Academic Achievement of LEP Students in Texas

The most recent data for the state of Texas suggests that LEP students are far behind their peers in all subject areas (TEA 2005a). For example, in 2005 the average

Reading NAEP scale score for fourth grade students in Texas was 219 (USDE 2006b, 2). This score is considered at a basic proficiency level.⁶ In contrast, LEP Texas fourth graders had an average score of 196 (USDE 2006b, 2), which is considered below basic proficiency. These data are shown in Figure 3.2.

Figure 3.2
Average Scale Scores on the 2005 Reading NAEP for All Fourth Grade Students and Fourth Grade LEP Students in Texas.



Source: United States Department of Education (USDE). 2006b. Office of Educational Research and Improvement, National Center for Educational Statistics, National Assessment of Educational Progress. NAEP 2005 Assessment Results, 2.

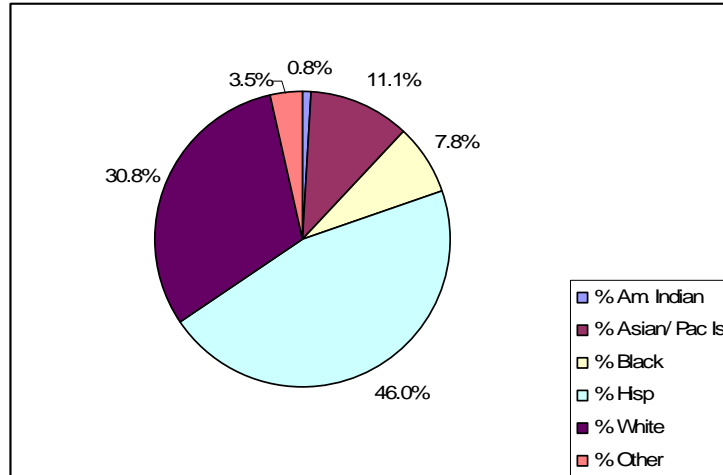
Educational Setting in California

In the 2004-05 school year, there were nearly six and a half million students enrolled in California schools (USDE 2006a). As shown in Figure 3.3, like in Texas, Hispanics (46%) make up the largest ethnic group among California's school-age

⁶ The grade 4 reading NAEP achievement levels are defined as follows (USDE 2006c, 1):
Below Basic (207 or lower);
Basic (208-237), partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade;
Proficient (238-267), solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter; and
Advanced (268 or above), superior performance.

population enrolled in prekindergarten through twelfth grade. Again, like in Texas, Whites (30.8%) make up the next largest group of enrolled PK-12 students, followed by Asians (11.1%).

Figure 3.3
2004-05 California Distribution of Students Enrolled in PK-12 by Ethnicity



Source: NCES, Common Core of Data (CCD), "State Nonfiscal Survey of Public Elementary/Secondary Education", 2004-05 v.1c

In 2003-04 (most current data available), there were 234,299 (3.6%) migrant students in California (USDE 2006a). During the 2004-05 school year, 49.1% of students in California were eligible for free or reduced price lunch (CDE 2005) and 1,591,525 (25.2%) were classified as limited English proficient (LEP) (CDE 2006). In addition, the one-year dropout rate⁷ in California in the 2004-05 school year was 3.1% (CDE 2005).

In 2004 approximately 67.0% of California's LEP students were enrolled in elementary school (K-6) (CDE 2006). The 2000 U.S. Census found that 42.6% of students ages 5-17 spoke a language other than English in their homes, and 76.0% of those students list Spanish as their primary language. Fifteen percent of students whose

⁷ California began using the NCES definition of dropout in the 2002-03 school year. The one-year dropout rate is dropouts divided by enrollment for grades 9-12.

primary language at home was Spanish speak English "not well" or "not at all" (U.S. Census 2000).

California LEP Educational Policy

California Education Code (CEC) §306 defines a LEP student as “a child who does not speak English or whose native language is not English and who is not currently able to perform ordinary classroom work in English.” In June 1998 the state of California passed Proposition 227 mandating that LEP students be placed in classes with rigorous English immersion instruction (Davila and Mora 2000). California Education Code §305 states that:

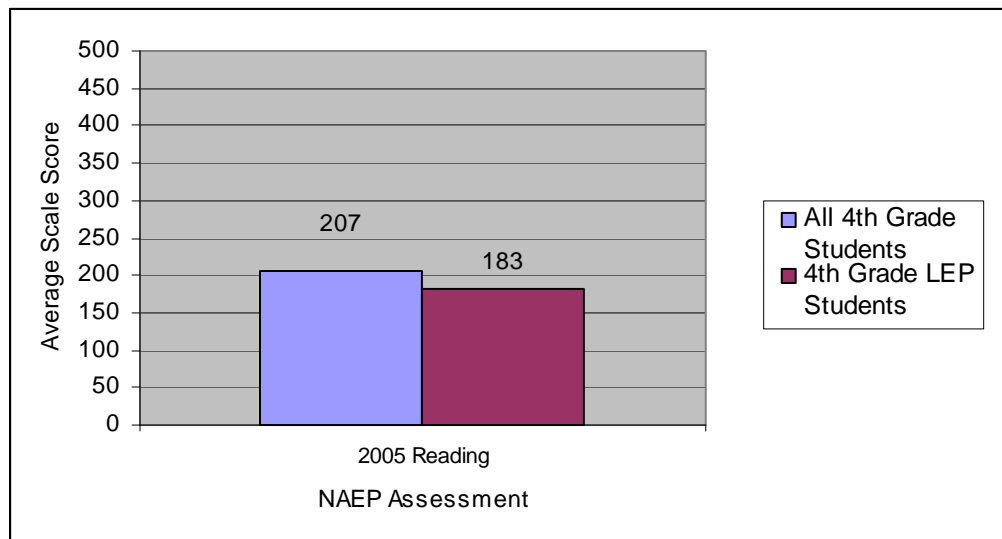
All children in California public schools shall be taught English by being taught in English. In particular, this shall require that all children be placed in English language classrooms. Children who are English learners shall be educated through sheltered English immersion during a temporary transition period not normally intended to exceed one year.

The primary method of instruction of ELLs in California occurs by way of "sheltered English immersion" or "structured English immersion", which is defined as “an English language acquisition process for young children in which nearly all classroom instruction is in English but with the curriculum and presentation designed for children who are learning the language” (CEC §306). In 2006 47% of ELLs were enrolled in structured English immersion (SEI) programs, while the remaining LEP students were either mainstreamed (39%) or participated in other types of English language instruction or no specific language program at all (14%) (CDE 2006).

Academic Achievement of LEP Students in California

Just as in Texas, LEP students in California perform at a lower academic level than English-speaking students. In 2005 the average Reading NAEP scale score for fourth grade students in California was 207 (USDE 2006b, 1). This score is considered below the basic proficiency level. In 2005 the average Reading NAEP scale score for fourth grade LEP students in California was 183 (USDE 2006b, 1), which is well below the basic proficiency level. This information is presented in figure 3.4.

Figure 3.4
Average Scale Scores on the 2005 Reading NAEP for All Fourth Grade Students and Fourth Grade LEP Students in California.



Source: United States Department of Education (USDE). 2006b. Office of Educational Research and Improvement, National Center for Educational Statistics, National Assessment of Educational Progress. NAEP 2005 Assessment Results, 1.

Chapter Summary

California and Texas are similar in several ways, including size, percent economically disadvantaged, percent migrant, ethnic composition, and dropout rate (see Appendix A for a summary of each states' statistics). California and Texas differ slightly

on total enrollment, percent of students that are limited English proficient, primary language spoken at home, and Reading NAEP scores. Although these differences are non-trivial, California and Texas are still more similar to each other than many other states and are appropriate for comparison in a program evaluation study. Further, the evidence provided in this chapter establishes that Texas and California LEP student populations read at levels much below average levels. California addresses the needs of its students with limited English proficiency through a structured English immersion program, while Texas uses a bilingual approach. This paper asks which method (immersion or bilingual education) is most effective at teaching LEP students to read. The next chapter explains the methodology used to make the comparison.

Chapter IV: Methodology

Chapter Purpose

This chapter describes the methods used to evaluate the effectiveness of bilingual education (BE) and structured English immersion (SEI) programs for limited English proficient (LEP) students. The hypothesis is operationalized and the data used in the evaluation are discussed. The study's sample, and the statistical methods used to test the hypothesis, are explained. The purpose of this program evaluation is to compare the effectiveness of two programs for LEP students on the reading performance of fourth grade Hispanic Spanish-speaking LEP students.

Research Technique

This study evaluates the bilingual education (BE) and structured English immersion (SEI) programs using existing data from the 2005 NAEP. The NAEP is a standardized national assessment instrument administered randomly to a nationally representative sample of students every two years at the fourth, eighth, and twelfth grades (USDE 2006d). Multiple regression analysis is used to compare the impact of BE programs in southern Texas and SEI programs in southern California.

Operationalization

The hypothesis was tested using a model that contained one treatment and several control variables associated with the likelihood of student success in school identified in the literature. The hypothesis is operationalized in Table 4.1.

Table 4.1
Operationalization of the Hypothesis

Variables	Hypothesis	Definition/ Measurement	Data Source
<u>Dependent</u>			
Academic performance in Reading		2005 Reading NAEP scale scores	National Center for Education Statistics
<u>Independent</u>			
Campus program type	H ₁ +	0=Texas 1=California	National Center for Education Statistics
<u>Control</u>			
<i>Campus-Level</i>			
Percent migrant		1-100	State education agencies
Percent Hispanic		1-100	National Center for Education Statistics
Percent limited English proficient		0=25% or less 1=26% or more	National Center for Education Statistics
Percent economically disadvantaged		0=50% or less 1=51% or more	National Center for Education Statistics
Campus size		Total enrollment range 432 - 1063	National Center for Education Statistics
<i>Student-Level</i>			
Gender		0=Female 1=Male	National Center for Education Statistics
Economic status		0=Not eligible for free/reduced lunch 1=Eligible for free/reduced lunch	National Center for Education Statistics
Talk about studies at home		0=Less than 2 times a month 1=Once a week or more	National Center for Education Statistics
Number of books in the home		0=0-25 books 1= 26 books or more	National Center for Education Statistics
Language other than English spoken at home		0=Never or once in awhile 1=Half of the time or more	National Center for Education Statistics
Years in English language program		0=Less than 2 years 1=2 years or more	National Center for Education Statistics

Dependent Variable

The dependent variable is the scale score achieved on the 2005 fourth grade Reading NAEP. The NAEP is the only continuous, nationally representative assessment “of what America's students know and can do in various subject areas” (USDE 2007c, 1). The assessment is administered periodically in reading, mathematics, science, writing, civics, the arts, geography, economics, and U.S. history (USDE 2007c).⁸ The scale score on the reading section of the 2005 NAEP defines the student’s academic performance for the purposes of this study. The dependent variable is continuous with values between 0 and 500. In 2005, the national average Reading NAEP scale score for fourth grade students was 219 (USDE 2006b, page 1). For fourth grade LEP students, the 2005 national average Reading NAEP scale score was 187 (USDE 2006b, page 1). This information is shown in Table 4.2.

Table 4.2
2005 National Reading Scale Scores for All Fourth Grade Students and Fourth Grade LEP Students

<i>Group of Students</i>	<i>2005 Reading NAEP</i>
All 4 th Grade Students	219
4 th Grade LEP Students	187

Source: United States Department of Education (USDE). 2006b. Office of Educational Research and Improvement, National Center for Educational Statistics, National Assessment of Educational Progress. NAEP 2005 Assessment Results, 1.

Independent Variables

The treatment variable for this study is campus program type. The treatment variable is dichotomous, with the value of 0 representing that the student attended a

⁸ For additional information about NAEP, visit <http://nationsreportcard.gov>.

campus in Texas that offered a bilingual education (BE) program in the fourth grade, and the value of 1 representing that a student attended a campus in California that offered a structured English immersion (SEI) program in the fourth grade.

Control Variables

The literature identified twelve variables other than type of program that can influence a student's reading ability. The control variables are further classified as campus-level (5) and student-level (7) variables. Campus-level variables should be controlled for because a student's academic achievement can be linked to the type of school they attend. For example, minority students are likely to attend poorer schools with fewer resources, teacher training opportunities, and college-preparation courses—all factors associated with lower reading scores (Gandara 1995). The campus-level control variables examined in this study are percent migrant, percent Hispanic, percent LEP, percent economically disadvantaged, and campus size (see Table 4.1 for measurement and data source information).

Individual student characteristics (student-level variables) also influence a child's ability to read and thus must be controlled for. Often females perform better academically and attain English proficiency faster than males (Schmid 2001; Portes and Hao 1998). Next, socioeconomic status (SES) is controlled. Students with low SES are at a higher risk of dropping out of school (Rumberger 1995). Dropouts usually have weaker reading skills than graduates. The disparity in reading between graduates and dropouts begins in elementary school. For the purpose of this study, socioeconomic status is measured by three variables: 1) economic status, 2) family discussions about

school and studies, and 3) number of books in the home. The importance placed on education in the home and the amount of support offered towards completion of school activities is often associated with parent education levels and family income (Duncan and Magnuson 2005; USDE 2001; Shields and Behrman 2004; Hernandez 2004). Language spoken at home (other than English most of the time) is another student-level control variable. Exposure to English at home reinforces what is learned in school (Hannah 2003). The last control variable used in the model is length of time in an English language program. English language proficiency programs can have varying impacts at different stages in a child's language development (Gersten and Woodward 1995; Baker & de Kanter 1983; Cziko 1992). For example, a student may show a considerable initial gain on an academic assessment, though the results are likely to plateau over time (Gersten and Woodward 1995). All control variables are dichotomous (see table 4.1 for measurement and data source information).

Sample

Although care is taken to control for factors that influence fourth grade reading ability, it is necessary to choose samples of children in California and Texas that are as similar as possible. The sample for this study is comprised of Hispanic Spanish-speaking LEP fourth grade students from six campuses in southern California and six campuses in southern Texas that participated in the 2005 administration of the Reading NAEP.⁹

Special education students were excluded for the purposes of this study. Fourth grade

⁹ The National Center of Education Statistics selects a sample of students to participate in the 2005 Reading NAEP based on an aggregate of public school student samples from each region that participate (USDE 2006d). Next, the aggregate sample is merged with a representative student sample from nonpublic schools around the country (USDE 2006d).

students were used because often there are fewer than 20 LEP students in the higher grades. In many Texas middle schools there are fewer than 20 LEP students per grade level, so English as a Second Language (ESL) or other programs are implemented instead of bilingual education. Also, participating districts are not required to report NAEP results to the National Center of Education Statistics (NCES). NAEP data for twelfth graders are least often reported, so the data at this grade level would possibly be unreliable and biased.

Campuses in the southern region of each state with at least 10% LEP and greater than 0.1% migrant students were selected. An additional criterion for campuses in Texas was that each must have at least 20 Spanish-speaking LEP students in the fourth grade to ensure that bilingual education was part of the required curriculum for these students. Six campuses within each group were then randomly selected for further analysis. Table 4.3 shows the number of students in the sample from each state (see Appendix B for sample descriptives).

Table 4.3
Number of Students in the Sample by State

Texas	California
40	40

Statistical Procedure

Independent Samples T-Test

The first procedure used for this study is an independent samples t-test, which is used to determine if the means of the two groups are similar. This method is an appropriate first step to determine if California and Texas are performing similarly on the

NAEP at baseline. The results of the t-test will indicate whether discrepancies in the sample should be adjusted for in the regression analysis.

Pearson's Correlation

Pearson's Correlation is the second statistical technique that is used for this study. Pearson's Correlation is used to determine strength of a linear relationship between independent or control variables. Two highly correlated independent or control variables may be measuring the same underlying phenomenon (Babbie 2004). If two variables are highly correlated, one of the variables will need to be dropped since "nothing more would be added by including the other item" (Babbie 2004, 156).

Multiple Regression Analysis

Multiple regression analysis reveals the unique independent influence of the type of English instruction program (BE or SEI) while controlling for other possible explanatory factors. The assumptions made for regression analysis are the absence of nonsampling errors, continuous interval data, and simple random sampling (Babbie 2004). Two separate regression analyses are run to determine the impact that the SEI and BE programs have had on the Reading NAEP score. There are two regression models: the first one does not take the difference between Texas and California overall Reading NAEP scores into account (unweighted), and the second one does take into account the difference as determined through the t-test (weighted). The models are detailed below.

Model 1a:

y (2005 **Unweighted** Reading NAEP scale score) = $a + b_1$ (campus program type) + b_2 (campus percent migrant) + b_3 (campus percent Hispanic) + b_4 (campus percent LEP) +

b_5 (campus size) + b_6 (campus percent economically disadvantaged) + b_7 (gender) + b_8 (student economic status) + b_9 (talk about studies at home) + b_{10} (number of books in the home) + b_{11} (language other than English spoken at home) + b_{12} (length of time student has been in an English language program)

Model 2a:

y (2005 **Weighted** Reading NAEP scale score) = $a + b_1$ (campus program type) + b_2 (campus percent migrant) + b_3 (campus percent Hispanic) + b_4 (campus percent LEP) + b_5 (campus size) + b_6 (campus percent economically disadvantaged) + b_7 (gender) + b_8 (student economic status) + b_9 (talk about studies at home) + b_{10} (number of books in the home) + b_{11} (language other than English spoken at home) + b_{12} (length of time student has been in an English language program)

Human Subjects Protection

In order to protect the identities of the children in the study, NCES provided data with individual students identified by number only. The identification numbers representing individual subjects are not included in this paper. Computer security procedures aligned with NCES security standards are in place to protect the confidential records. The confidential data were kept on a secure computer in a locked study carrel in the Alkek Library at Texas State University. Only signatories of the NCES Affidavit of Nondisclosure and the Senior Official at Texas State University have room access. In addition, the following security procedures were in place to protect the data:

- Access is limited to the secure room by locking the office when away from the computer.
- Data are only accessed and used within the secure room.
- A password is required as a part of the computer login process.
- Read-only access has been initiated for the original data.
- An automatic password protected screensaver enables after five minutes of inactivity.
- No routine backups of the restricted data are made.
- Restricted-use data are not placed on a server (network) or laptop computer.
- Project office room keys will be returned and computer login will be disabled within 24 hours after any staff leave the project. The Primary Project Officer at Texas State University will notify NCES of any staff changes.

- The data will be removed from the project computer and overwritten at the end of the project.

Chapter Summary

This chapter presented the methodology used to test for the effect of bilingual education versus structured English immersion on fourth graders' reading ability. An independent samples t-test, Pearson's correlation, and multiple regression analysis are used to compare the impact of BE programs in southern Texas and SEI programs in southern California. The next chapter discusses the results of each statistical procedure.

Chapter V: Results

The purpose of this study is to compare the effectiveness of the structured English immersion (SEI) program in southern California and the bilingual education (BE) program in southern Texas on the reading performance of fourth grade Hispanic Spanish-speaking LEP students. This chapter provides the results of the multiple regression analysis that tested the impact that the SEI and BE programs have had on the Reading National Assessment of Educational Progress (NAEP) score. Table 5.1 presents the results of an independent samples t-test between the 2005 Reading NAEP score of fourth grade students in Texas overall and fourth grade students in California overall. Table 5.2 shows the results of a correlation analysis between the continuous independent variables. Table 5.3 and Table 5.4 show the results of the regression analysis.

Independent Samples T-Test

An independent samples t-test was conducted to determine if California and Texas are performing similarly on the Reading NAEP at baseline.

Table 5.1
Fourth Grade Student performance on the 2005 Reading NAEP in Texas
California¹⁰

Texas (N = 7740)		California (N = 10560)	
Mean	SD	Mean	SD
216.8751(**)	31.17458	205.3677	36.00524

** $t(17795.881) = 23.089, P < .01$

¹⁰ Analyses that may contain personally identifiable data have been adjusted to ensure confidentiality.

Fourth grade students in Texas had significantly higher scores on the 2005 Reading NAEP than fourth grade students in California (see Appendix C for detailed results of the independent samples t-test). On average, fourth grade students in Texas scored 11.5074 points more than fourth grade students in California (1.056 times higher). The samples are not equivalent. The lack of equivalence is further controlled by using a weighted regression analysis.

Pearson’s Correlation

Pearson’s Correlation is used to determine strength of linear relationships between control variables. Only the continuous control variables, percent Hispanic, percent migrant, and campus size, were tested for correlation. Table 5.2 shows there are positive and relatively weak relationships between campus size and both percent migrant and percent Hispanic. The strongest and most positive relationship is between percent migrant and percent Hispanic (.740).

Table 5.2
Pearson’s Correlation Results

	Percent Hispanic	Percent Migrant	Campus size
Percent Hispanic	1.00	.740(**)	-.160
Percent Migrant		1.00	-.140
Campus size			1.00

** Correlation is significant at the 0.01 level (2-tailed).

This correlation is strong enough to indicate that one of these variables needs to be dropped in order for the regression to provide unbiased estimates. Percent migrant was dropped from the analysis due to the high correlation.

Multiple Regression Analysis

The campus-level variables campus percent economically disadvantaged and percent enrollment identified as LEP, and the student-level variable economic status were dropped because there was not enough variation in the responses to accurately measure the variables' impact. Based on the results of the Pearson's Correlation matrix and the small variation in responses of three variables above, Models 1a and 2a have been reconstructed as follows:

Model 1b:

y (2005 **Unweighted** Reading NAEP scale score) = $a + b_1$ (campus program type) + b_2 (campus percent Hispanic) + b_3 (campus size) + b_4 (gender) + b_5 (talk about studies at home) + b_6 (number of books in the home) + b_7 (language other than English spoken at home) + b_8 (length of time student has been in an English language program)

Model 2b:

y (2005 **Weighted** Reading NAEP scale score) = $a + b_1$ (campus program type) + b_2 (campus percent Hispanic) + b_3 (campus size) + b_4 (gender) + b_5 (talk about studies at home) + b_6 (number of books in the home) + b_7 (language other than English spoken at home) + b_8 (length of time student has been in an English language program)

Table 5.3 displays the multiple regression analysis results that test the impact of the SEI and BE programs on the 2005 unweighted and weighted Reading NAEP scale scores (see Appendix D for detailed results of the multiple regression analyses). In Model 1b, the adjusted R square shows that none of the 2005 Reading NAEP results are explained by the model. The F statistic is not significant, which indicates that the coefficient as a whole is not significantly different than zero. None of the variables contribute to explaining NAEP scores.

Table 5.3
Impact on 2005 Reading NAEP Scale Scores

Independent Variable	Coefficient	
	Model 1b	Model 2b
Percent Hispanic	.039	.039
Campus program type	-15.946	-5.494
Campus size	-.003	-.001
Number of books in home	-9.568	-9.158
Talk about studies at home	-2.850	-2.374
Language other than English spoken at home	4.396	4.250
Length of time student has been in English language program	4.423	4.352
Gender	4.008	4.033
Constant	180.075	168.576
Adjusted R Square	-.099	-.163
F Statistic	.515	.248

In Model 1b, the campus program type value is not significant. Therefore, the unweighted 2005 Reading NAEP scale score is not affected by the type of English language curriculum implemented in each state.

In Model 2b, the adjusted R square shows that none of the 2005 Reading NAEP results are explained by the model. The F statistic and the campus program type are not significant. As demonstrated in Table 5.3, none of the variables contribute to explaining NAEP scores. Therefore, there was no significant relationship between the weighted 2005 Reading NAEP scale score and the type of English language curriculum implemented in each state.

Chapter Summary

This chapter discussed the results of the independent samples t-test, the Pearson's correlation, and the multiple regression analysis. The results show that neither the structured English immersion nor the bilingual education program affected the 2005

Reading NAEP scale score of fourth grade LEP students in California or Texas. The next chapter discusses conclusions of this study. The chapter summarizes the research findings, strengths and weaknesses in the data examined, and possibilities for future research in this area.

Chapter VI: Conclusions

Education of limited English proficient (LEP) children is a vital concern in America. In order to ensure these students perform at a high academic level, it is important to closely examine the effectiveness of language development programs that are offered in elementary schools. Programs such as bilingual education (BE) and structured English immersion (SEI) lay the groundwork for developing literacy skills that will help LEP children develop their academic abilities.

The unweighted (Model 1b) and the weighted results (Model 2b) of students participating in SEI in California and BE in Texas presented in Chapter Five do not support the hypothesis that, controlling for ethnicity, gender, socioeconomic status, primary language spoken at home, and length of time student has participated in an English language program, Hispanic Spanish-speaking LEP students participating in SEI will score higher on the 2005 Reading National Assessment of Educational Progress (NAEP) than Hispanic Spanish-speaking LEP students participating in BE. The results indicate that neither of the English language acquisition programs had a significantly greater impact on the reading skills of LEP students. Without a clear distinction that one program is more effective than the other, policymakers and school administrators may want to instead compare costs associated with each when determining which program to implement. In addition, the priority that one may place on retaining a child's native language should be considered.

Strengths and Weaknesses of Data

The National Assessment of Education Progress (NAEP) is a federally designed test that is regarded as a sound assessment of student academic ability in the core subjects (Carnoy and Loeb 2002; Lutkus et al. 2003). The assessment serves as a standard measure of students' progress across the United States (Haertel 2003; Lutkus et al. 2003).

The NAEP data are limited in that LEP students are exempt from participating in the NAEP "if they have received instruction in English for less than three years and are judged by school staff to be incapable of participating in the assessment in English" (Haertel 2003, 8). This exception may reduce the number of LEP students that have taken the NAEP. However, this may not necessarily be negative since it lessens the degree that students will have taken a test that is not appropriate for their level of language ability.

Suggestions for Future Research

This research examines factors affecting limited English proficient (LEP) students' academic achievement in reading. One of the variables controlled for in this program evaluation study was the length of time that students participated in an English language program, with the maximum year category as three years or more. As Gersten and Woodward (1995) found, language acquisition programs may require varying amounts of time in order to see their full impact. Future research may look at LEP students in structured English immersion (SEI) and bilingual education (BE) programs longitudinally in order to determine if results differ at various stages of a students' development.

Reading skills are an important foundation for looking at student achievement because often these skills carry over into other subject areas (such as reading a science book or answering math problems). In learning new subjects, LEP students must use a variety of skills to first comprehend the question and then to understand how to determine the answer. Future studies may expand the focus to determine if SEI or BE influences academic achievement in other subject areas.

The attitudes and behaviors of principals, teachers, and other students regarding LEP students can have an impact on how motivated a student is to learn the majority language. Therefore it would be interesting to determine if school climate has an impact on the academic performance of LEP students. In addition, the priority that a school community places on maintaining a student's native language should be considered.

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Appendix A

Summary of Educational Settings in Texas, California, and the United States

	Total # Students*	Ethnicity*						Migrant*	Free/ Reduced Price Lunch*	Limited English Proficient *	Dropout Rate**	LEP in Grades K-6	Lang. Other than English at Home*		2005 4 th Gr. Reading NAEP *	
		His %	Whi %	Asi/ Pac %	Bla %	Am Ind %	Oth %						Total	Spanish Primary Lang.	All	LEP
Texas	4.4 million	44.7	37.7	3.0	14.2	0.3	0.0	2.5%	54.6%	15.6%	0.9%	69.4%	32.4%	90.8%	219	196
California	6.4 million	46.0	30.8	11.1	7.8	3.5	0.8	3.6%	49.1%	25.2%	3.1%	67.0%	42.6%	76.0%	207	183
United States	50 million	20.0	58.0	4.2	16.0	0.7	0.0	***	17.0%	2.9%	3.8%	***	20.0%	71.7%	219	187

*Demographic and National Assessment of Educational Progress (NAEP) data for the United States can be found at United States Department of Education (USDE). 2007d. Office of Educational Research and Improvement, National Center for Educational Statistics. *The Condition of Education 2007*.

**Dropout rate for the United States can be found at United States Department of Education (USDE). 2002a. Office of Educational Research and Improvement, National Center for Educational Statistics. *Dropout Rates in the United States—2000*.

***Data not available.

Appendix B

Sample Descriptive Statistics

	Campus size	Percent Hispanic	Campus Program type	Unweighted Reading (Plausible composite avg)	Books in home	Talk about studies at home	Language other than English spoken at home	Length of time student has been in English language program	Weighted_Reading	Gender
N Valid	70	80	80	60	60	60	60	70	60	80
Missing	10	0	0	20	20	20	20	10	20	0
Mean	658.22	80.92	.47	181.2730	.41	.67	.62	.85	177.5755	.55
Std. Deviation	197.181	23.414	.502	28.16728	.496	.474	.490	.364	28.55297	.501

Appendix C

Group Statistics

State	N	Mean	Std. Deviation	Std. Error Mean
Texas	7740	216.8751	31.17458	.35437
California	10560	205.3677	36.00524	.35044

Independent Samples T-Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	226.783	.000	22.586	18298	.000	11.50741	.50949	10.50877	12.50606
Equal variances not assumed			23.089	17800.881	.000	11.50741	.49839	10.53053	12.48430

Appendix D

Unweighted regression results (Model 1b)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325(a)	.105	-.099	29.56044

a Predictors: (Constant), Gender, Campus size, Talk about studies at home, Campus program type, Language other than English spoken at home, Length of time student has been in English language program, books in home, Percent Hispanic

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3603.557	8	450.445	.515	.837(a)
	Residual	30583.690	35	873.820		
	Total	34187.246	43			

a Predictors: (Constant), Gender, Campus size, Talk about studies at home, Campus program type, Language other than English spoken at home, Length of time student has been in English language program, Books in home, Percent Hispanic

b Dependent Variable: NAEP Reading scale score (Plausible composite avg)

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	180.075	35.263		5.107	.000
	Percent Hispanic	.039	.312	.026	.125	.901
	Campus program type	-15.946	12.217	-.283	-1.305	.200
	Campus size	-.003	.027	-.016	-.096	.924
	Books in home	-9.568	10.548	-.167	-.907	.371
	Talk about studies at home	-2.850	10.755	-.048	-.265	.793
	Language other than English spoken at home	4.396	9.902	.078	.444	.660
	Length of time student has been in English language program	4.423	17.056	.046	.259	.797
	Gender	4.008	9.328	.070	.430	.670

a Dependent Variable: NAEP Reading scale score (Plausible composite avg)

Weighted regression results (Model 2b)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.232(a)	.054	-.163	28.55297

a Predictors: (Constant), Gender, Campus size, Talk about studies at home, Campus program type, Language other than English spoken at home, Length of time student has been in English language program, books in home, Percent Hispanic

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1616.612	8	202.077	.248	.978(a)
	Residual	28534.525	35	815.272		
	Total	30151.137	43			

a Predictors: (Constant), Gender, Campus size, Talk about studies at home, Campus program type, Language other than English spoken at home, Length of time student has been in English language program, Books in home, Percent Hispanic

b Dependent Variable: Weighted_Read

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	168.576	34.061		4.949	.000
	Percent Hispanic	.039	.302	.028	.130	.898
	Campus program type	-5.494	11.801	-.104	-.466	.644
	Campus size	-.001	.026	-.009	-.051	.959
	Books in home	-9.158	10.189	-.170	-.899	.375
	Talk about studies at home	-2.374	10.389	-.042	-.229	.821
	Language other than English spoken at home	4.250	9.565	.080	.444	.660
	Length of time student has been in English language program	4.352	16.475	.048	.264	.793
	Gender	4.033	9.011	.075	.448	.657

a Dependent Variable: Weighted_Read