

A STUDY OF THE PREDICTORS OF ACADEMIC SUCCESS OF HIGH SCHOOL  
ENGLISH LANGUAGE LEARNERS IN ONE  
TENNESSEE URBAN SCHOOL DISTRICT

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To the Graduate School:

We are submitting a dissertation by Sharada Sekar entitled "A Study of the Predictors of Academic Success of High School English Language Learners in One Tennessee Urban School District." We recommend that it be accepted in partial fulfillment of the requirements for the degree, Doctor of Education in Curriculum and Instruction.

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## ABSTRACT

SHARADA SEKAR. A Study of the Predictors of Academic Success of High School English Language Learners in One Tennessee Urban School District (under the direction of DR. DAVID F. MCCARGAR).

In consideration of the widening achievement gap between native English speaking and non-English speaking students, the purpose of this study was to determine whether a predictable relationship exists between the academic achievement of English language learners (ELLs) and their background variables. Specifically, this study examined differences in gender, SES (based on free and reduced lunch), ethnicity, length of residence in the USA, and first language, and studied whether any associations existed between these factors and the ELLs' academic performance, as measured by Gateway scores in English II and Algebra I. Intermediate ELL students, grades nine through twelve, who attended schools in a Tennessee Metropolitan School District were the subjects of this study. The study used the archival data of Gateway scores from 2004 – 2007. Simple linear regression analyses and Analyses of Variance were conducted to test whether there was any association between the variables and the English language learners' performance on the Gateway exams. There were no significant associations between gender and academic achievement or between length of residence in the USA and academic achievement. However, significant differences were found based on the first language and ethnicity of the English language learners.

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## CHAPTER I

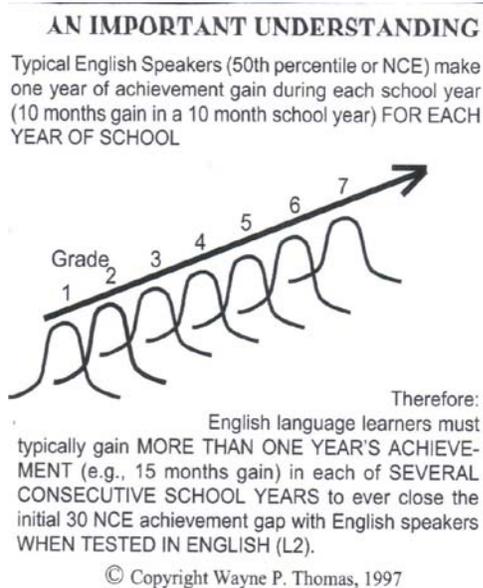
### INTRODUCTION

The numbers of English Language Learners (ELLs) in United States schools continue to grow rapidly (Genessee et al., 2005). From 1991–1992 through 2001–2002, the number of identified ELLs in public schools (K–12) grew 95%, while total enrollment increased by only 12%; in 2002–2003, more than 5 million school-age children were identified as ELLs, 10.2% of the K–12 public school student population. These students speak more than 400 languages, but nearly 80% are native Spanish speakers (Genessee et al., 2005; Kindler, 2002). The U.S. Census Bureau estimates that between 1999 and 2050, the total number of foreign-born Americans will increase from 26 million to 53.8 million (Schmid, 2001).

#### Widening Achievement Gap Between ELL and Non-ELL Student Population

The term achievement gap is used to denote differences in the academic achievement of particular groups of students (Reynolds, 2002). According to Reynolds, the National Assessment of Educational Progress (NAEP) statistics indicate that the imbalance in achievement between the minority and majority population continues past high school. For example, by the age of 29, African Americans were half as likely as Whites to earn a bachelor's degree, and Latinos were only one-third as likely.

Research reports show that non-English language background (NELB) students receive lower grades, are judged by their teachers to have poorer academic abilities, and score below their classmates on standardized tests of reading and Math (Echaverria & Graves, 2003; Short & Echaverria, 1999). Not only are large numbers of these students limited English proficient, but they also come from a variety of divergent language backgrounds (<https://waldo.library.nashville.org/patroninfobackgrounds>) (Echaverria & Graves, 2003). For example, the number of Americans speaking a language other than English at home has doubled since 1979 (NCES, 2004). While the number of NELB students has grown exponentially over the years across the United States, their level of academic achievement has remained significantly low, and these students have high dropout rates (Short & Echaverria, 1999). According to Collier (1987), native English speakers typically make one year of achievement gain during each school year for each year of school, which means that ELLs must gain more than this in order to close the ever widening achievement gap. Collier's idea is represented in Figure 1.



*Figure 1. Collier's ELL gain required to close achievement gap.*

This widening achievement gap between the ELL and non-ELL population is indeed a great concern. Studies (e.g., Hakuta et al, 2003; NCES, 2004) have revealed a continuing and widening gap between the English language learners and their English speaking peers. This gap, according to the researchers, indicates the daunting task facing students who have to acquire oral and academic English while also keeping pace with native English speaking peers. According to Reynolds (2002), the factors that cause this widening achievement gap can be broadly categorized into “in-school” and “out-of-school factors.” While schools have control over the former, they have little or no control over the latter. In-school factors include teacher quality, school culture, teacher expectations, availability of resources, tracking, and availability of upper level courses (e.g., Advanced Placement, Honors, etc.). Out-of-school factors include socio-economic status (SES), ethnicity, parental influences, previous formal schooling, length of

residence in U.S.A., age upon arrival in U.S.A., social distance, gender, first language, and first language proficiency.

Federal law (Equal Education Opportunities Act, 1974; No Child Left Behind Act, 2001) requires that schools provide services to speakers of languages other than English who need instructional assistance. The Supreme Court decision following the case of *Lau v. Nichols* held that providing identical education is not equal education under Title VI, that doing so forecloses NELB students from any meaningful education, and that districts must take affirmative steps to help non-English speakers overcome education barriers (*Lau v. Nichols*, 414 US 563 (1974)). Schools usually offer a variety of services and instructional strategies to help NELB students. Even with such additional support, research studies (e.g., NCES, 2004) have shown that the students who have difficulty speaking English suffer academically, falling behind their English-speaking peers. Language minority students and those with limited English proficiency have lower performance results in achievement tests for reading and mathematics and have lower aspirations for continuing education after high school (NCES, 2004).

### English Language Learners in Tennessee

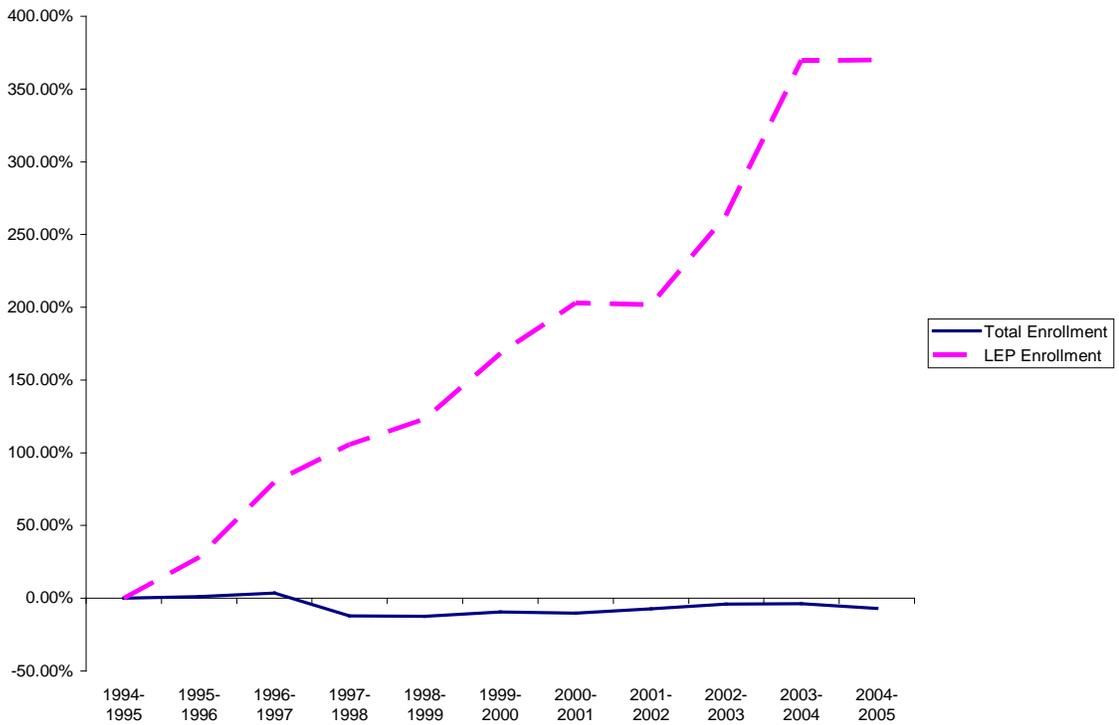
The number of ELLs in the State of Tennessee has dramatically increased in recent years (Humbles, 2008). In the school year 2004-2005, one of Tennessee's largest urban school districts served 4,996 students from 84 countries, representing 77 languages (Blackwood, 2005). The enrolled ESL students belonged to a wide range of nationalities and spoke several different languages including Spanish, Kurdish, Arabic, Amharic,

Vietnamese, Cambodian, Laotian, Hindi, Gujarati, Wolof, Tigrinya, Farsi, Dari, French, Kirundi, Grebo, Krahn, and Chinese. The percentage of increase in the number of limited English proficient (LEP) students in Tennessee from 1994-2005 released by the U.S. Department of Education (2006) is shown in Table 1. The same data are represented in the graph in Figure 2.

Table 1

*Rate of LEP Growth in Tennessee*

| School Year | Total Enrollment | % of Growth from 94-95 | LEP Enrollment | % of Growth from 94-95 |
|-------------|------------------|------------------------|----------------|------------------------|
| 1994-1995   | 1,012,318        | 0.0                    | 4,119          | 0.0                    |
| 1995-1996   | 1,023,195        | 1.1                    | 5,278          | 28.1                   |
| 1996-1997   | 1,047,966        | 3.5                    | 7,413          | 80                     |
| 1997-1998   | 890,805          | -12                    | 8,465          | 105.5                  |
| 1998-1999   | 885,848          | -12.5                  | 9,191          | 123.1                  |
| 1999-2000   | 916,202          | -9.5                   | 11,039         | 168.0                  |
| 2000-2001   | 909,388          | -10.2                  | 12,475         | 202.9                  |
| 2001-2002   | 938,162          | -7.3                   | 12,422         | 201.6                  |
| 2002-2003   | 973,170          | -3.9                   | 14,953         | 263.0                  |
| 2003-2004   | 974,133          | -3.8                   | 19,352         | 369.8                  |
| 2004-2005   | 941,097          | -7.0                   | 19,355         | 369.9                  |



*Figure 2.* Rate of LEP growth in Tennessee.

Every student who entered the school system completed a home language survey to determine his or her first language. Title III of the No Child Left Behind Act (PL 107-110, 115 Stat. 2002) mandates the State Educational Agency (SEA) to establish standards and objectives for raising the level of English proficiency. It also mandates testing for all limited English proficient (NELB) children participating in a program funded by Title III and requires the SEA to describe how each local educational agency (LEA) is held accountable for ensuring adequate yearly progress (AYP) for NELB children.

Currently, the state of Tennessee, in which this study was conducted, uses the English Language Development Assessment (ELDA), developed by the Council of Chief

State School Officers (CCSSO), as their assessment for ELL students. The ELDA cut scores are based on standard setting carried out by Measurement Incorporated for the CCSSO (Bunch, 2006). All levels of the test (K-2, 3-5, 6-8, 9-12) have five identified levels, from pre-functional to fully English proficient. The ELDA represents these levels using a proficiency scale of one to five. A student who receives a composite score of four or five on the ELDA is exited from the ELL program. A student's composite score is derived from the domain scores for reading, writing, speaking, and listening. Reading and writing, being the more academic skills, carry more weight in the derivation of the composite score.

### Purpose of the Study

The purpose of this study was to determine whether an association existed between the academic achievement of high school ELL students and certain background variables. In this study, the term academic achievement referred to successful performance on the Gateway exams mandated by the State of Tennessee. Passing the Gateway exams is required for graduation. While the number of ELLs increases in the schools, their achievement lags behind that of their native English-speaking peers. As with ELLs nationwide, Tennessee's ELLs have low test scores, high drop-out rates, and struggle to keep up with the rigors of the standardized tests like the Gateway. In this study associations were examined between Gateway scores of high school ELLs in English and Algebra and the following background variables: Gender, SES (based on free

and reduced lunch), ethnicity, length of residence in USA, and first language. The study used Gateway scores in English II and Algebra I.

### Statement of the Problem

The English Language Learner (ELL) population in United States schools continues to grow more rapidly than overall student growth (Genessee et al., 2005). One area of concern is the widening achievement gap between the non-English speaking students and their English speaking peers since, in addition to being limited English proficient, a large number of these students also come from a variety of divergent language backgrounds (Echaverria & Graves, 2003). *No Child Left Behind*, the 2001 reauthorization of the Elementary and Secondary Education Act, calls for annual tests of reading and mathematics for all students at certain grade levels (in schools receiving Title I and Title III funds) and deliberately includes ELLs in state accountability systems. There is a strong call for high standards and accountability on the part of the school systems. As a result, even ELL students with limited English proficiency are not exempt from the standardized tests that are a part of the exit criteria in most school systems. Test norms may be inappropriate because of differences between ELLs and students in the norming samples, and language proficiency and other background factors may influence test performance (e.g., Abedi, Lord, & Hofstetter, 1998) and academic achievement. There is limited comprehensive research on the variables that relates to ELL students' performance and their achievement on standardized tests at the high school level. The

research examined the association between ELL students' background variables and their academic achievement.

### Significance of the Study

This study sought to identify the factors, and the combination of factors, associated with ELL student performance, especially on state-mandated exit examinations. Educators and administrators alike need to be cognizant of the factors that lead to a widening achievement gap between the majority English speaking students and the minority ELL students. This knowledge will be beneficial in designing programs in the future or re-structuring existing programs to take into account the influence of these factors, and to develop strategies to counter their influence and make academic achievement highly attainable to the struggling ELL population.

### Research Questions

The following research questions were addressed in this study.

1. What is the association, if any, between the gender of English language learners and their Algebra I and English II Gateway scores?
2. What is the association, if any, between the SES of English language learners and their Algebra I and English II Gateway scores?
3. What is the association, if any, between the first language of English language learners and their Algebra I and English II Gateway scores?

4. What is the association, if any, between the ethnicity of English language learners and their Algebra I and English II Gateway scores?
5. What is the association, if any, between the length of residence of English language learners in the U.S.A., and their Algebra I and English II Gateway scores?

#### Limitations of the Study

This study may be limited by the following conditions:

1. The study used archival data from a Tennessee metropolitan school district. The study does not account for any differences in instructional set up among schools.
2. This study did not account for endogenous variables that affect second language acquisition, such as motivation, psycho-social integration with the second language culture, aptitude, learning styles and strategies.

#### Definition of Terms

Many specialized terms were used throughout this study. These terms are an inextricable part of any study related to the ELL population. A list of these terms, as well as a brief definition of the terms, is given below.

*Academic Success or Academic Achievement* - was used in this study to indicate successful performance on the Gateway Exams.

*Achievement Gap* - the quantified difference in academic achievement between two groups of students (Reynolds, 2002).

*BICS* - Basic Interpersonal Communication Skills refers to conversational ability, or the use of language for everyday communication (Cummins, 1981a).

*CALP*- Cognitive Academic Language Proficiency refers to the language ability needed to be academically successful (Cummins, 1981a).

*ELL* - English Language Learner (Tennessee State Department of Education, n.d.).

*ESL* - English as a Second Language (Cummins, 1981a).

*Gateway Examinations* - exit exams in the State of Tennessee; students are expected to pass these exams in Algebra I, English II, and Biology (Tennessee State Department of Education, n.d.).

*NELB* - an acronym for Non-English Language Background students. The terms *ELL* and *NELB* are used interchangeably in the present study (NCLB, 2000).

*SES* - an acronym for Socio-Economic Status (Coleman, 1966). In this study, free or reduced lunch was used as an index of SES.

The following chapter provides a review of existing literature on the factors or combination of factors that correlate with the academic success of English language learners.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Introduction

The literature concerning the predictors of academic success of high school ELL students discussed three areas of concern that will be addressed independently as well as in relation to each other. These areas were the explosive growth of non-native English speaking students in schools; the widening achievement gap between majority and minority students; and the difference between spoken language (BICS) and academic language (CALP), and how this BICS/CALP difference directly affects ELL students. These three sections will also discuss the inter-relationship of the following background variables to each of the concerns addressed, and most importantly, to ELL student achievement: SES or socioeconomic status, gender, age on arrival in U.S.A., length of residence in U.S.A., first language, ethnicity, and the number of years in an ELL program. The final section of this chapter will offer a detailed discussion of the literature regarding the relationship of these variables to ELL student achievement.

#### Explosive Growth of ELL Population

The number of students from non-English speaking backgrounds continues to rise across the country. From 1991–1992 through 2001–2002, the number of identified ELLs in public schools (K–12) grew 95%, while total enrollment increased by only 12%. In

2002–2003, more than 5 million school-age children were identified as ELLs, 10.2% of the K–12 public school student population. These students speak more than 400 languages, but nearly 80% are native Spanish speakers (Genessee et al., 2005). This increase is particularly significant for educators now that the No Child Left Behind Act, the 2001 reauthorization of the Elementary and Secondary Education Act of 1965, calls for high standards and strong accountability for schools and students, and does not exclude the ELLs because of their limited English proficiency.

#### Widening Achievement Gap between ELL and Non-ELL Student Populations

According to Kindler (2002), compilation of reports from 41 state education agencies reveals that only 18.7% of students classified as limited English proficient met state norms for reading in English. Students from language minority backgrounds also have higher dropout rates and are more frequently placed in lower ability groups than English-background students (Genessee et al., 2005; Short & Echaverria, 1999). In its 2004 report, the National Center for Education Statistics compared language minority youth and young adults with native English speakers on several education and economic indicators: elementary/secondary school enrollment, grade retention, high school completion, postsecondary enrollment, and highest educational level attained. The study showed that language minority students and those with limited proficiency had lower performance results on achievement tests for reading and mathematics and had lower aspirations for continuing education after high school.

## Basic Interpersonal Communication Skills and Cognitive Academic

### Language Proficiency

Cummins (1981a) articulated the difference between social and academic language acquisition. Basic Interpersonal Communication Skills (BICS) are language skills needed in social situations. Social interactions are usually context embedded and occur in a meaningful social context. They are not very demanding cognitively and the language required is not specialized. According to Cummins, these language skills usually develop within six months to two years after arrival in the U.S.A. Problems arise when teachers and administrators think that a child is proficient in a language when they demonstrate good social English. CALP refers to formal academic learning which includes listening, speaking, reading, and writing about subject area content material. This level of language learning is essential for students to succeed in school. Students need time and support to become proficient in academic areas, and according to Cummins, this usually takes from five to seven years.

Recent research (Thomas & Collier, 1995) has shown that if a child has no prior schooling or has no support in native language development, it may take seven to ten years for ELLs to catch up with their peers. The research included findings from five large urban and suburban school districts in various regions of the United States where large numbers of language minority students attended public schools, with over 700,000 language minority student records collected from 1982-1996. The researchers limited their analyses to only those newly arriving immigrant students who were assessed when they arrived in this country who had received schooling in their home country at or above

grade level in their native language. They found a 5-7 year pattern similar to that found by Cummins (1981). Students who arrived between ages 8 and 11 who had received at least 2-5 years of schooling taught through their primary language (L1) in their home country were the ones who took only 5-7 years. The children who arrived before age 8 required 7-10 years or more, even though they had the same background characteristics as the 8-11 year-old arrivals. The only difference between the two groups was that the younger children had received little or no formal schooling in their first language, and this factor appeared to be significant in their studies.

#### Correlates to English Language Learners' Academic Achievement

According to Garcia and Gopal (2003), research on correlates to the academic achievement of English language learners has often focused on student background variables such as gender, SES, ethnicity, and immigrant experience. They warn that most of these studies tend to oversimplify the effects of many of these variables because, even among the larger framework of these overarching variables, the experiences and situations are different for every individual learner. This section discusses the relationship of the following seven variables to the academic achievement of students: socio-economic status, gender, age, length of residence, first language, ethnicity, and ELL program models.

##### *Socio-Economic Status*

SES has been found to have a high correlation with student's achievement (Gonzalez, 2001). The Coleman report which, in 1966, established the relationship of

SES to educational outcomes was an extensive study of schools and schooling under the direction of James Coleman and Ernest Campbell. The researchers found that the social composition of a school impacted student achievement through the student body's educational background and aspirations rather than the racial composition.

Extensive research has demonstrated that children from lower SES backgrounds are more likely to have difficulty in reading and writing when compared to children of a higher status, especially during the elementary school years (Torgesen, 2000; White, 1982). The Coleman report (1966) confirmed for educators what they thought they already knew: "... [T]hat a strong relationship exists between all kinds of achievement variables and what has come to be known as socioeconomic status (SES)" (p. 46). According to Boocock (1972), the family characteristic that is the most powerful predictor of school performance is socioeconomic status (SES): the higher the SES of the student's family, the higher his/her academic achievement. According to Charters (1963), SES predicts grades, achievement and intelligence test scores, grade level retentions, course failure, truancy, suspension from school, high school dropout, plan for college attendance, and total amount of formal schooling. Poorer home literacy, including limited access to reading materials or modeling of reading by adults in the home, has been cited as a main causal variable leading to reduced academic performance in low SES children (Torgesen, 2000; White, 1982). Most of the immigrant students come from highly impoverished backgrounds, with both parents working two or more jobs to maintain the family. Families who arrive from countries such as Somalia are refugees, and the children

were never sent to a formal educational institution. They have little or no literacy in their first language, and thus have no repertoire of skills of any kind to fall back on.

In a longitudinal study of minority students' long-term academic achievement, Thomas and Collier (2002) found that SES typically influenced from 3-6% of the minority students' readiness and achievement as measured by standardized tests. They used three socioeconomic measures - middle income (pay for lunch), low-to-middle income (reduced lunch), and low income (free lunch). They found that the free lunch groups performed the lowest. On all measures, the language minority group that paid for their lunch, an indicator of middle-income background, performed at or above grade level. The researchers concluded that socioeconomic status as measured by paid, reduced price, or free lunch may have some considerable influence on student achievement. They also stated that when students are schooled only in English in U.S. schools, proficiency in English upon entry has a stronger influence than socioeconomic status.

### *Gender*

According to Oxford (1990), foreign language learning strategies are specific actions, behaviors, steps, or techniques students use to improve their progress in comprehending, internalizing and using the foreign language. In a research report on gender differences in language learning styles, Oxford elaborated on what research suggests about the relationship between gender and learning styles- that women and girls have different learning styles than that of men and boys. As gender is an issue with important theoretical and pedagogical implications in second language learning, substantial research has been conducted regarding the relationship of gender and

language learning strategy (Oxford, 1993; Oxford, 1995; Oxford, Young, Ito, & Sumrall, 1993; Young & Oxford, 1997). These studies have found that gender can have a significant impact on how students learn a language.

An emerging theory for this gender difference proposes that although sometimes males surpassed females in the use of a particular strategy, females employ more learning strategies or employ strategies more effectively (Erhman & Oxford, 1989; Oxford, 1994). Studies relating to gender and second language reading comprehension have concluded that males scored better than females on topics that they were able to relate to, such as cars, machines, laser thermometers, sports, etc. However, the females scored better than the males on topics related to family, a frustrated housewife, etc.

The Educational Testing Service's review (Coley, 2001) of gender differences in elementary and secondary education within racial and ethnic groups covered student results on the various tests of the National Assessment of Educational Progress (NAEP), in several years over the last decade, administered to a nationally representative sample of students at three grade or age levels. The gender gap varied only slightly across the three years reviewed.

A number of studies have tried to explain math and science gender gaps (Lauzon, 2001). Biological explanations have been advanced suggesting that there are innate differences between the sexes that imply differential performance on assessments (Benbow & Stanley, 1980, 1983). Socialization or environmental factors receive more attention in the literature. According to Oakes (1990), individual factors can be loosely grouped into "cognitive" and "affective" classes. With respect to cognitive differences,

much has been written about gender differences in spatial ability in particular. Though there is debate about the extent of these cognitive differences and whether they translate into differences on standardized achievement tests, there is evidence that they can be overcome by training. Affective factors involve the attitude, motivation and self perception of students. Affective factors often studied, include differences between the genders in the relative interest in “people” and “things,” enjoyment of math, perceived utility of math, stereotyping of math as the domain of males, and confidence in one’s own ability. While the existence of cognitive difference is inconclusive, it does seem clear that girls exhibit more negative attitudes toward math and science. However, there is little conclusive evidence that these negative attitudes cause lower achievement for girls (Oakes, 1990).

School factors might also underlie gender differences and include such things as access to resources, individual guidance and encouragement, the presence of role models, teacher expectations, teaching practices and teacher-student interactions. Lastly, societal factors that can lead to gender differences in math achievement have been widely studied. The disadvantages associated with low socioeconomic status (SES) lead to lower than average test scores for low SES students. There is some evidence that SES impacts women more than men (Ware, Steckler, & Lesserman, 1985). When considering differences in standardized tests, some suggest that differences are related more to test-taking strategy than to actual differences in knowledge (Gallagher et al., 2000).

### *Age at Second Language Acquisition*

The critical period hypothesis of Lenneberg (1967) focused on child-adult differences in language learning and claimed that younger learners were the better learners. Later studies however have helped bust the myth that in language learning, younger is better. Studies of oral language skill acquisition by children of different ages have led to the conclusion that, initially, older children acquire language faster than younger children. These results focused on oral language proficiency, which is not the same as acquiring language for academic purposes. For academic purposes, students need an entire range of skills. Short-term studies comparing students of different ages on different language tasks revealed an initial advantage for the older learner. Furthermore, long-term studies, according to Collier (1988), showed a continuing advantage for the older student. Collier (1987) analyzed the length of time required for 1,548 immigrants to gain proficiency in English. She found that students who were eight to twelve years old on arrival were the first to reach the 50<sup>th</sup> percentile or normal curve equivalent on all content area tests, and they did so within four to five years. Students who were five to seven years old on arrival fell significantly behind the older children in achievement. The students who were between the ages of 12 and 15 on their arrival to the United States struggled the most to reach grade and age norms. Collier concluded that age and age related factors such as age on arrival was a major variable in the study of second language acquisition. This advantage for the older learner is attributed to the fact that older learners have already acquired a repertoire of language learning skills while mastering their first language. These skills are available for use in mastering a second

language. However, younger children are still in the process of attaining mastery of their first language, and hence have no available skills to transfer to second language learning.

According to Stevens (2006), the three variables “age on arrival,” “length of residence,” and “chronological age” are linearly dependent. Age on arrival is, in other words, the age of onset of second language acquisition. Age at onset of L2 acquisition is usually measured by age on arrival in the destination country. It is often considered a better measure of the age at onset of learning an L2 than the age at which lessons began, because age at immigration marks the respondent’s beginning of participation in social settings effectively dominated by the L2 (Stevens, 2006). Also, according to Stevens, research studies demonstrate a negative correlation between age on arrival and test scores, suggesting a decline in language learning skills over childhood into adolescence, which, in turn, supported the idea of maturational constraints.

#### *Length of Residence in the USA*

The term “length of residence (LOR)” refers to the amount of time spent immersed in an L2 context. It was first used by Jim Cummins (1981a) when he published one of the most often-cited studies in this field. In this study, Cummins analyzed immigrants' school achievement data, focusing on two main variables: length of residence and age on arrival in Canada. He found that Canadian school-age immigrants took five to seven years after their arrival in Canadian schools to reach the grade-level achievement in English of their native-English-speaking peer group. Thomas and Collier (2002) have conducted studies similar to that of Cummins and have found the same general data patterns. The researchers found length of residence of immigrant students to

be an important background variable that influenced language learning along with years of previous formal schooling. Length of residence worked in conjunction with the students' previous formal schooling in English or in their home language to influence the language outcomes of the learners. The researchers also found that the powerful variables in their datasets were the number of years of schooling in students' primary language, age on arrival in the U.S., and the number of years of development of academic English. They found that the three variables were interrelated, because students needed a significant number of years of both primary language schooling and English schooling to do well in school in their second language. According to the researchers, students who arrived in the U.S. at a young age (between birth and age 8) and thus did not receive enough years of primary or first language (L1) schooling in their home country, did less well than those who arrived when they were older and had received at least four to five years of grade level L1 schooling.

### *First Language*

Literature regarding first language being a predictor of successful second language learning focuses on what Cummins (1981) called the linguistic interdependence hypothesis- that success in learning a second language depended on skills learned in the native language. There are also studies that focus on the relationship of foreign language aptitude to success in learning a foreign language (Sparks et al., 2006). There is no extant literature on first language being a predictor of academic success at the secondary or post-secondary levels.

According to literature, literacy in the first language is considered an essential factor in successful second language learning (e.g., Cummins, 1981a). Both cognitive development and academic development in the first language have been found to have positive effects on second-language learning (Collier, 1989, 1992; Thomas & Collier, 2002). Thomas and Collier found that the particular first language that a student spoke was not a powerful variable in long-term academic achievement; they found that Spanish speakers made the same rate of progress in learning the second language as did speakers of Arabic, Mandarin Chinese, Amharic, Korean, Russian or Vietnamese. But they discovered a relationship between the first and second languages. The true predictor, according to them, was not which first language the student spoke but how much cognitive and academic development in his or her first language the student had experienced. Academic skills, literacy development, concept formation, subject knowledge, and strategy development learned in the first language, transfer to the second language. Students whose first language has English cognates, like in Spanish, may be at a greater advantage than students whose first language is Chinese, or Japanese, for example.

A theory of second language acquisition that informs literacy instruction for teachers of bilingual learners is the Cross-Linguistic Transfer Hypothesis (Odlin, 1989). This theory posits that knowledge is transferred from the learners' first language into the performance of cognitive and linguistic tasks in the second language. The Cross-Linguistic Transfer Hypothesis suggests that the greater the similarity in the writing systems of the two languages, the greater the degree of transfer, thus reducing the time

and difficulties involved in learning to read and write the second language (Odlin, 1989). Both English and Spanish have a common ancestral bond, namely, Latin. As a result, they share many cognates, which can be very beneficial to the Spanish learner of English. Learning to read and write in the first language supports success with reading and writing in the second language (August & Hakuta, 1997). Also, literacy skills related to decoding tasks of reading have been found to transfer between languages (Bialystok, Luk, & Kwan, 2005). English vocabulary is a primary determinant of reading comprehension for second-language readers. Those students whose first language has many cognates with English have an advantage in English vocabulary recognition, but they often require explicit instruction to optimize transfer for comprehension (Garcia & Nagy, 1993). It is important for educators to find a potential for reciprocity between the two languages.

### *Ethnicity*

Studies on the relationship of ethnicity to students' academic success have found that ethnicity and income are interrelated (Abbott & Joireman, 2001; Coleman, 1966; Epstein, 1972). Mostly, all of these studies indicate that income provides the greatest impact on student achievement when the effects of ethnicity are taken into account. Studies relating to the impact of ethnicity are often intertwined with those related to social class. According to Epstein (1972), the results often show significant effects for both class and ethnicity, which is not very surprising because of their close association. Also, Epstein mentions several studies that found a positive relationship in the United States between class standing and both amount and quality of schooling. He also mentions the Coleman Report (1966) as the most comprehensive study on ethnic

differences in achievement. The results showed that the minority children scored significantly lower on every level of the administered tests, and this deficiency progressively increased with grade level.

There were also interesting results with regard to attitudes toward educational attainment. The oriental-American students outperformed the white students on every variable of intellectual value, aspiration, and achievement. There were not many differences in the attitudes towards academic work between the Black and White children. However, the Blacks were less inclined to take concrete steps towards implementing their educational aspirations. Puerto-Rican children in the study had even lower aspirations than the Blacks and little or no inclination for reading, writing, or higher education. While discussing the independent effects of ethnicity, Epstein cites several studies which found significant differences in the academic achievement of students from different ethnicities but were from the same social class. In his review he discusses the factors that have been attributed to these differences among ethnicities.

There have been controversial arguments that the racial differences may be a direct result of genetic differences. Studies have also focused on the fact that certain ethnic groups have a legacy of varying degrees of deprivation, not totally evident in their social class position, which in turn affect their achievement (Kao & Thompson, 2003). The researchers, in their comprehensive study of the relationship between ethnic factors and academic achievement, also found patterns of ethnic and racial disadvantage in tracking. According to them, both tracking and differential course taking in schools had significant effects on the educational outcomes of the students. Minority students were

more likely to be placed in the general or vocational track than the Whites. Moreover, school track placements were based on students' level of English language ability. This resulted in otherwise talented non-English speaking children being placed in lower ability, remedial, or vocational classes. This in turn had an effect on students' choice of courses. Those placed in the remedial tracks had the lowest credits in Math and Language. Students placed in the higher academic tracks were found to have more academic motivation and were more inclined to go to college. Researchers have noted that Blacks, and especially Hispanics and Native Americans, are significantly more likely than white or other minority students to drop out of school (Kao & Thompson, 2003). Over representation of minorities in vocational tracks has a detrimental effect on the achievement of lower track students. Further, these students develop negative attitudes and behaviors related to learning. Among the minorities, however, disparities emerge even within the tracks. Kao and Thompson also refer to research that indicates there are substantial ethnic differences in school performance and expectations that lead to differences in dropping out of high school.

Parental education and family income is closely related to ethnicity and is the best predictor of eventual academic outcomes among youth (Kao & Thompson, 2003). Hispanics are most disadvantaged in terms of parental education levels. The researchers also found that racial and ethnic variation in grades and test scores are more likely to be influenced by parental background. They found that grades especially were highly correlated with parental SES. Kao and Thompson broadly categorize the arguments about differences in educational attainment between different ethnic groups into two groups.

The first argument is that the cultural orientation and beliefs of an ethnic group, which in turn influence the attitude towards educational attainment, play a major role. These cultural orientations can impact the odds at economic success negatively or positively. The second argument traces the structural position of the ethnic group focusing on their time of arrival, the skills that they brought with them, the needs of the local economy, and their ability to fulfill particular economic niches. Thus, this has a direct bearing on parental education, income, and SES.

### *ELL Program Models*

Research on the academic achievement of ELLs focuses greatly on the program models. According to a study by Genesse et al. (2005), there was strong evidence that the educational success of ELLs was positively related to the length of time in a specialized program. The need for appropriate and effective program models for non-English speaking students in U.S. public schools has been acknowledged by almost all school systems throughout the country. Title VI of the Civil Rights Act of 1964, which was a landmark legislation in the United States, outlawed segregation in the U.S. schools and public places. It also started the Equal Employment Opportunity Commission which prohibits discrimination on the basis of national origin (Civil Rights Act of 1964, P. L. 88 353, 78 Stat. 241 (1964)). The U.S. Supreme Court case, *Lau v. Nichols* (*Lau et al. v. Nichols et al.* 414 U.S. 563 (1974)), established the legal basis mandating both appropriate instruction and access to curriculum for ESL students. Subsequently, the Equal Education Opportunities Act of 1974 required schools to take appropriate steps to assure equal access as stipulated in the *Lau v. Nichols* case. The No Child Left Behind

(NCLB) Act of 2001 provides for strong accountability for the education of all children and for certain provisions specific to ELL students, especially under Titles I and III of the Act. The ultimate objective was to close the achievement gaps between the ESL and non-ESL students.

Thomas and Collier (1995), in their national study of school effectiveness for language minority students' long-term academic achievement, observed that ELL students made the most instructional gains in an enrichment program, and not in a remedial program. Also, they observed that the highest quality ESL content programs closed about half of the total achievement gap for the ELL students. The researchers present this information in a graph, as shown in Figure 3.

Program 1: Two-way developmental bilingual education (BE)  
 Program 2: One-way developmental BE, including ESL taught through academic content  
 Program 3: Transitional BE, including ESL taught through academic content  
 Program 4: Transitional BE, including ESL, both taught traditionally  
 Program 5: ESL taught through academic content using current approaches  
 Program 6: ESL pullout--taught traditionally

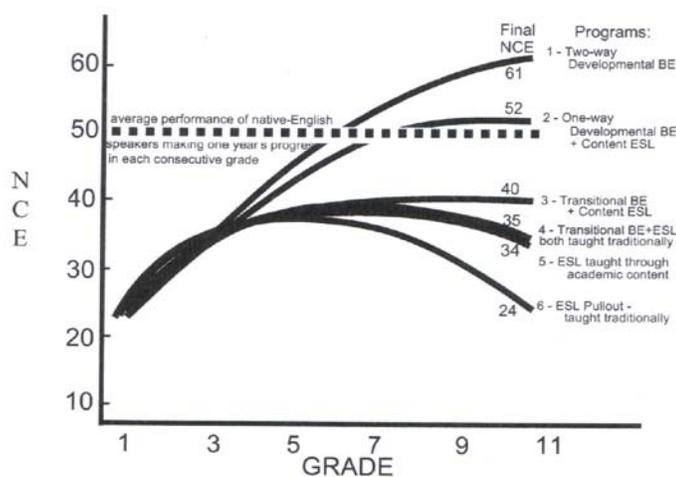


Figure 3. ELL program effects on achievement.

According to Thomas and Collier (1995), an enrichment ESL program must meet the students' linguistic, emotional, social, physical, cognitive, and academic needs, for which the schools need to create a natural learning environment with lots of natural, rich, oral and written language, with all students working together on challenging thematic units across the curriculum. There is no extant literature in the field that discusses the relationship of the amount of time spent in a specialized ESL program to the ESL students' academic achievement or performance on exit exams. However, literature (e.g., Thomas & Collier, 1995) does focus on the importance of such specialized programs in narrowing the achievement gap between the native and non-native speakers of English.

### Summary and Conclusions

The number of limited English proficient students continues to grow in U.S. schools. However, these students lag behind their native English speaking peers in academic achievement. They have higher drop-out rates, lower graduation rates, and are struggling to keep up with the rigors of the state-mandated standardized exit exams. The No Child Left Behind (NCLB) Act of 2001 provides for strong accountability for the education of all children and for certain provisions specific to ELL students, especially under Titles I and III of the Act. At the high school level, these students are burdened with the double load of having to acquire a second language and the cognitive academic language proficiency to be successful in all their content area subjects. Thomas and Collier (1995) found that students who had some formal education in their primary language prior to their arrival in the U.S.A. had a much better chance of performing well

academically. They also found age on arrival, socio-economic status, and proficiency in first language to be strong predictors of academic success for the ELL students.

There is not much extant literature that explains a correlation between gender and academic achievement of ELLs, ethnicity and ELL academic success, or the relationship of the time spent in a specialized ELL program to high school achievement. Also, there is a dearth of comprehensive literature that addresses the relationship of the variables discussed earlier to high school ELLs' academic success. The present study investigated the relationship of these variables to the academic success of high school English language learners.

The following chapter details the methodology used in this research. The chapter elaborates on the hypotheses, the subjects, data, and research design used in the present study.

## CHAPTER III

### METHODOLOGY

This study was conducted in a Tennessee urban school district which is the 49th largest urban school district in the nation. The consolidated city-county district covers an area of approximately 525 square miles. There are 133 schools, including 74 elementary schools, 35 middle schools, 15 high schools, four alternative and non-traditional learning centers, three special education schools, and two charter schools. The school district serves 74,155 students and employs 5,710 teachers and certificated staff, as well as 4,159 support staff. The students represent 84 countries and speak languages from more than 77 language groups. According to the information on the district's website, there are currently 8,270 English language learners enrolled in the district. The ethnic composition of the student body is as follows: Asian - 3.16%; Black - 48.18%; Hispanic - 14.35%; Indian - 0.16%; Pacific Islander - 0.10%; White - 34.06% .

#### Design of the Study

The present study examined associations between certain English language learner background variables and the students' performance on the state mandated Gateway tests for English II and Algebra I. At the high school level the learners do not have a lot of time to become proficient in a second language. This is important because research (Cummins, 1981a) has shown that CALP, or Cognitive Academic Language

Proficiency, can take up to seven years to acquire. As a result, the achievement gap between the native speakers and the non-native speakers of English is ever widening. This study examined whether an association existed between factors such as SES (socio-economic status), gender, ethnicity, first language, and length of residence in USA and the achievement of the ELL students on the Algebra I and English II Gateway examinations.

### Data Collection

This study used archival data from the school district's central database management system. This database system is called Chancery Student Management System developed and distributed by Pearsons School Systems. This system allows the individual teacher to open the student information system on the computer desktop. Teachers can post attendance and grades directly into the system and view test scores, attendance, and other student information relevant to instruction. They can also review yearly absences of their students to determine trends that may impact student performance, as well as have immediate access to parent contact numbers to communicate effectively about student progress. Administrators are able to monitor student test results online, report disciplinary issues, and submit required student and school information to federal, state, and local agencies.

This study used the Gateway scores of the students for the school years 2004-2007. As a first step in getting access to this information, an application/request letter was sent to the Research and Evaluation department of the school district explaining the

rationale of the study. On gaining approval from the central office, data were received in an Excel file, by email.

### Participants

The present study collected data on English language learners from seven high schools that served as ELL centers for the school district, and who took the Gateway Exams in Algebra and English as part of their graduation requirement during the school years 2004-2007. The students in this study were in 9th through 12<sup>th</sup> grades. These students represented the following ethnicities: White, Black, Hispanic, and Asian. Arabic speakers from Egypt and the Middle-East, and Kurdish speakers fell under the “White” category. Students from Africa, who were not Egyptian, were designated as “Black.” All Spanish speakers were designated Hispanic; students under the category of “Asian” included students from any part of Asia, such as India, Pakistan, Sri Lanka, Laos, Bangladesh, Thailand, Vietnam, China, Korea, and Japan. The analysis involved approximately 5,287 ELL students. The student body was representative of over 50 languages, among which the following languages were chosen for the study: Amharic, Arabic, Kurdish, Somali, Spanish, and Vietnamese. The reason for this is that only those languages that were represented by at least 25 students or more were retained for the analysis. For example, among the African languages, Amharic and Somali had maximum representation with 33 and 93 students, respectively. There were several other African languages represented in the data, but they did not account for a large number: Igbo ( $n = 3$ ), Ibo ( $n = 6$ ), Kinyarwanda ( $n = 1$ ), Kurundi ( $n = 5$ ), Swahili ( $n = 11$ ), Tigrinya

( $n = 14$ ). The same was also true for Asian languages. There were several Asian languages represented; however, Vietnamese, with a count of 27, was chosen. This selection process was based on practical reasons; with data that were spread so wide and thin, the results had a potential to be skewed or reveal a statistically significant association when none existed.

### Instrumentation

This study used the Gateway Scores for the subjects Algebra I and English II for each school year from 2004-2007. The Gateway Exams are roughly equivalent to a 10th-grade level. The State Board of Education's High School Examinations Policy outlined the rationale for Gateway testing in Tennessee, including: (a) improvement of school learning in core content areas; (b) preparation for further learning; (c) diagnostic information on students' performance; (d) school and program improvements; and (e) accountability for students, teachers, schools, and school systems (Tennessee State Board of Education, 2002). Students who started high school in the fall of 2001 or later must score as proficient or advanced on all the Gateway tests in order to receive a diploma. The Gateway Exit Exams are Algebra I, Biology I, and English II. Each test has 62 questions and is not timed. The law requires that these tests count as 15% of the student's course grade. The State Department of Education has proficient and advanced cut scores for each test. The Tennessee Department of Education (2002) lists the number of questions that must be answered correctly to score proficient and advanced; this information has undergone slight changes from year to year.

### Data Collection Procedures

There were several steps involved in the data collection. The first step was to submit a copy of the research proposal to the Research and Evaluation department of the school district in order to get clearance to use their data for the present study. As soon as a letter of cooperation was received from the school district, the outline of this study was submitted to the Human Subjects Committee for approval. On receiving clearance from the Human Subjects committee, the data for this study were received from the central office of the school district in an Excel file, through email. The school district had assigned a statistician to work with the researcher. Interactions were chiefly via email or over the telephone. The researcher had to clearly indicate the information that needed to be included in the data. The data that were received included information about intermediate/advanced ELL students in grades 9-12 for the school years 2004-2007. This was then imported into Statview statistical software for data analysis. The data that were received were not complete. There was a lot of missing information, and the data set was too unwieldy for manipulation. The file contained data including free/reduced lunch information; gender; ethnicity; first language; date of entry into a U.S. school (only available for 2006 and 2007); Algebra I scale scores for fall, spring, and summer of each academic year; Algebra I placement level for fall, spring, and summer of each academic year; English II scale scores for fall, spring and summer of each academic year; and English II placement levels for fall, spring, and summer of each academic year. The first step was to eliminate rows with insufficient data. It was decided that the spring scale scores alone would be retained for analysis. There were two reasons for this. The first

reason was to keep the data analysis from becoming too complicated due to the unwieldy nature of the data. Secondly, the spring scores were included because all eligible students first took their Gateway exam in spring, and the researcher believed that these spring scores were the true representation of the students' readiness for the test, prior to any intervention. The fall and summer scores represented subsequent attempts by those students who had failed to pass the Gateway exams the first time. With this end in view, any rows that did not have information on the spring scale scores for both Algebra I and English II Gateway exams were eliminated from the analysis.

The original dataset had information for 6,918 students. After editing out the rows with insufficient data, the dataset had 5,287 subjects. Next, the data were reclassified according to language groups. There were over 50 languages represented in the data set. For the purposes of this analysis, only 6 major language groups were considered (for reasons explained earlier): Spanish, Arabic, Kurdish, Somali, Vietnamese, and Amharic. As a result, the number of subjects in the dataset was now reduced to 3,143. Information regarding length of residence in the USA was only available for 2006 and 2007. This information was therefore retained in a separate file for data analysis and contained 1714 subjects. Lastly, only the spring scale scores for Algebra I and English II were retained for each academic year for reasons explained earlier.

Initially, the research questions included a study of the association of the following variables to ELL academic success: age on arrival in USA and number of years spent in an ELL program. However, these questions had to be eliminated from the study

due to insufficient information regarding the following: each student's date of entry into the USA, date of birth and length of participation in ELL services.

### Statistical Treatment

The data file consisted of two types of data – continuous and nominal. Initially, it was the researcher's intention to do a stepwise regression of all the variables. However, the presence of nominal data in the data set imposed restrictions on proceeding in this direction. As a result, a regression was conducted to analyze the correlation between independent variables such as gender, and months in the USA and the dependent variables, namely, the spring Algebra I and English II Gateway scores, which were all continuous variables. On the other hand, an ANOVA was conducted involving the following nominal variables: ethnicity, SES (free/reduced lunch status), and first language. An alpha level of 0.01 was used because the dataset was large (over 300) and therefore called for a lower significance level. At the 0.05 level, almost all differences would have become significant, though not important. Fisher's PLSD was chosen as the post-hoc test for all the analyses because no interaction effects were expected between subjects or between variables.

## Research Questions

### *Research Question 1*

*What is the association, if any, between English language learners' gender and their Algebra I and English II Gateway scores?*

A regression analysis was conducted using the Algebra I scale scores for the years 2004-2007 and the two independent variables of gender and number of months of residence in the USA. A regression analysis was also conducted for the English II scale scores for 2004-2007, using gender and number of months in the USA as independent variables. A Fisher's post-hoc test was then performed to establish the least significant difference.

### *Research Question 2*

*What is the association, if any, between English language learners' SES and their Algebra I and English II Gateway scores?*

An ANOVA was performed to examine any differences in the Gateway scores between students with free lunch and students with reduced lunch. There were 1,019 cases with no information about free/reduced lunch. It was unsure whether these fields represented failure to record information or the paid lunch category; therefore, they were not considered while interpreting the results of the analysis.

### *Research Question 3*

*What is the association, if any, between English language learners' first language and their Algebra I and English II Gateway scores?*

An ANOVA was conducted to examine if any significant differences existed among the following language groups in relation to the English and Algebra gateway scores: Amharic, Arabic, Kurdish, Somali, Spanish, and Vietnamese. There were over 50 languages represented in the data. For reasons mentioned earlier, these six languages were chosen for the study. Vietnamese was spoken by a considerably lesser number of students compared to the other five languages; however, it was added to the analysis in order to have a representative Asian language.

*Research Question 4*

*What is the association, if any, between English language learners' ethnicity and their Algebra I and English II Gateway scores?*

An ANOVA was performed to investigate any significant differences in the English II and Algebra I scores among the four major ethnic groups: Asian, Black, Hispanic, and White. An ANCOVA was then conducted with the variable months of residence in the USA as the covariate. This was done in order to examine any association between the variables ethnicity and the length of time spent in USA for both English and Algebra scores.

*Research Question 5*

*What is the association, if any, between English language learners' length of residence in U.S.A., and their Algebra I and English II Gateway scores?*

The length of residence was calculated using the date of entry into the USA information. This information was only available for 2006 and 2007. A simple linear regression analysis was performed to examine a relationship between the number of

months of residence of English Language Learners in the USA and their Gateway scores in English and Algebra.

### Null Hypotheses

The following null hypotheses were tested in the study.

1. There will be no statistically significant relationship, at the  $p \leq .01$  level, between the gender and the Algebra I and English II Gateway scores of the English language learners.
2. There will be no statistically significant difference, at the  $p \leq .01$  level, between the SES and the Algebra I and English II Gateway scores of the English language learners.
3. There will be no statistically significant difference, at the  $p \leq .01$  level, between the first languages and the Algebra I and English II Gateway scores of the English language learners.
4. There will be no statistically significant difference, at the  $p \leq .01$  level, between the ethnicity and the Algebra I and English II Gateway scores of the English language learners.
5. There will be no statistically significant difference, at the  $p \leq .01$  level, between the number of years of English language learners' length of residence in the USA and their Algebra I and English II Gateway scores.

Tables were produced showing the  $r$  values between gender and length of residence in the USA for each of the two Gateway exams. The significant values were checked in order to retain or reject Null Hypotheses 1 and 5.

A Fisher's post-hoc test was then performed to identify the least significant difference in the level of performance between ELLs on free lunch and ELLs on reduced lunch on each of the two Gateway exams. The significant values were checked in order to retain or reject Null Hypothesis 2.

A Fisher's post-hoc test was then performed to study the least significant difference in the level of performance among ELLs speaking different first languages on each of the two Gateway exams. The significant values were checked in order to retain or reject Null Hypothesis 2.

A Fisher's post-hoc test was then performed to study the least significant difference in the level of performance among ELLs from the four different ethnic backgrounds on each of the two Gateway exams. The significant values were checked in order to retain or reject Null Hypothesis 4.

Fisher's  $r$ - $z$  was conducted to study the least significant difference in the performance of ELLs on each of the two Gateway exams, based on their length of stay in the USA. The significant values were checked in order to determine retention or rejection of Null Hypothesis 5. The following chapter provides details of the data analyses performed to test the five null hypotheses.

## CHAPTER IV

### ANALYSIS OF DATA

This chapter provides the data analysis for the tests that were performed to examine whether any of the five variables had an association with the Gateway scores in Algebra I and English II. The five variables examined were gender, SES (based on free or reduced lunch), ethnicity, first language, and length of residence in the USA. There were over 50 languages represented in the data; out of these, six of the languages that had an  $n$  greater than 25 were chosen for the analysis. The four major ethnic groups that were included in the analysis are Asian, Black, Hispanic, and White. Chapter III explained the demographics of the students under each of the racial categories mentioned above.

#### Demographics

The analysis involved 5,287 ELL students from seven high schools in the Tennessee school district under study. These seven high schools serve as the ELL centers for this district. The student body represented over 50 languages from which the following languages were chosen for the study: Amharic, Arabic, Kurdish, Somali, Spanish, and Vietnamese. Only those languages that were represented by at least 25 students or more were retained for the analysis. For example, among the African languages, Amharic and Somali had maximum representation with 33 and 93 students, respectively. There were several other African languages represented in the data, but they

did not account for a large number: Igbo ( $n = 3$ ), Ibo ( $n = 6$ ), Kinyarwanda ( $n = 1$ ), Kurundi ( $n = 5$ ), Swahili ( $n = 11$ ), Tigrinya ( $n = 14$ ). The same was also true for Asian languages. There were several Asian languages represented; however, Vietnamese, with a count of 27 was chosen. This selection process was based on practical reasons; with data that were spread so wide and thin, the results had a potential to be skewed or reveal a statistically significant association when there was not one.

Next, Gateway scores for Algebra I and English II were used as outcome measures for this study. Although the original data file included these scores for fall, summer and spring, only the spring scores were used because all eligible students take the Gateway exams for the first time in spring, which is usually during the first week of May. Students who fail to pass during their first attempt are given subsequent chances in the fall and summer (upon successful completion of summer school for the subject). For the purposes of this study, only the spring scores were taken into account as they were considered the true representation of the students' readiness in the subject, prior to any subsequent intervention.

A detailed analysis of the data follows, with an explanation of why the hypotheses in question were retained or rejected.

### Research Question 1

*What is the association, if any, between English language learners' gender and their Algebra I and English II Gateway scores?*

Table 2 displays the descriptive statistics of the simple regression analysis performed with gender as the independent variable.

Table 2

*Regression for Gender and Gateway Exams*

|            | <i>N</i> | <i>R</i> | <i>R</i> <sup>2</sup> | <i>SE</i> | <i>p</i> |
|------------|----------|----------|-----------------------|-----------|----------|
| Algebra I  | 2588     | .012     | 1.363E-4              | 2.2       | 0.55     |
| English II | 1973     | .034     | .001                  | 2.3       | 0.13     |

Initially, a simple linear regression was conducted for the gender. The analysis revealed no significant correlation between gender and the Gateway scores in Algebra I ( $R^2 = 1.363E-4$ ) and English II ( $R^2 = .001$ ). Next, a simple linear regression analysis was conducted using gender and length of residence in the USA as the two independent variables for each of the two Gateway exams. Length of residence was termed “months in the USA” in the analysis. There was no particular underlying reason for the order in which these two variables were included in the analysis. This was because order of variable inclusion had no significant impact on the outcome of the analysis, in a simple regression. As explained in Chapter III, only these two variables could be included in the analysis as these were continuous variables. The rest of the variables could not be included in the regression analysis as they were all nominal variables. These two predictors accounted for less than a tenth of one percent of the variation in the two gateway scores ( $R^2 = .001$ ). Both gender and months in the USA did not demonstrate any significant effect on the Gateway scores. There was no significant correlation between

gender and the Gateway scores at the 0.01 level ( $p = .9342$ ) for Algebra I. There was also no significant correlation between months in the USA and Algebra I ( $p = .4131$ ). For English II, there was no significant correlation between gender ( $p = .5339$ ) nor months in the USA ( $p = .5608$ ) and English II scores, at the 0.01 level.

### Null Hypothesis 1

*There will be no statistically significant relationship at the  $p \leq .01$  level between the gender, and the Algebra I and English II Gateway scores of the English language learners.*

The  $p$ -value for gender in the correlations with Algebra I as the dependent variable was .2180, a value much higher than the significant value of 0.01. Gender was also negatively correlated with length of residence in the USA. Next, a regression analysis revealed no statistically significant difference at the 0.01 level for each of the Gateway exams with gender and months in the USA as independent variables. Based on the results of the regression, Null Hypothesis 1 was retained. Table 3 displays the results of the ANOVA generated in the regression analysis for gender and months in the USA.

Table 3

*ANOVA for Gender and Months in the USA on Gateway Scores*

| Dependent Variables | <i>df</i> | <i>SS</i> | <i>F</i> | <i>p</i> |
|---------------------|-----------|-----------|----------|----------|
| Algebra I           | 2         | 1996.77   | 0.34     | 0.71     |
| English II          | 2         | 1546.52   | 0.38     | 0.69     |

### Research Question 2

*What is the association, if any, between English language learners' SES and their Algebra I and English II Gateway scores?*

Table 4 gives the mean and standard deviation for the percentage of English language learners with free or reduced lunch who passed each of the two Gateway exams in the seven Tennessee high schools.

Table 4

*Descriptives for English Language Learners by Lunch Status and Passing Gateway Exams*

| Gateway    | Lunch Status | <i>n</i> | <i>M</i> | <i>SD</i> |
|------------|--------------|----------|----------|-----------|
| Algebra I  | Free         | 916      | 495.79   | 52.83     |
| Algebra I  | Reduced      | 58       | 512.29   | 42.74     |
| English II | Free         | 541      | 490.54   | 47.32     |
| English II | Reduced      | 60       | 513.87   | 33.58     |

An ANOVA was performed to test for any significant difference in the two Gateway exam scores based on free or reduced lunch. For Algebra I, there was no significant difference in the scores between students on free and reduced lunch at the 0.01 level. For English II, there was a significant difference between students on free and reduced lunch, at the 0.01 level ( $p = .0007$ ). Students on reduced lunch scored significantly higher than the students on free lunch.

#### Null Hypothesis 2

*There will be no statistically significant difference, at the  $p \leq .01$  level, between the SES of the English language learners and their Algebra I and English II Gateway scores.*

The two-tailed ANOVA tests conducted with Algebra and English II Gateway scores as the dependent variables, and free/reduced lunch as the independent variables, revealed a  $p$ -value less than 0.0001 and a power of 1.000, indicating that the test had a 100% ability to detect a significant difference. In English II, the students on reduced lunch performed significantly higher than those on free lunch. Based on these findings, Null Hypothesis 2 was rejected. Table 5 displays the results of the ANOVA for free/reduced lunch.

Table 5

*ANOVA for Gateway Scores by SES*

| Lunch Category   | <i>p</i>  |            |
|------------------|-----------|------------|
|                  | Algebra I | English II |
| No data, free    | < .0001*  | < .0001*   |
| No data, reduced | .4654     | .3730      |
| Free, reduced    | .0291     | .0007*     |

\* Significant at the 0.01 level

### Research Question 3

*What is the association, if any, between English language learners' first language and their Algebra I and English II Gateway scores?*

Table 6 gives the mean and standard deviation for ELL students with different first languages who passed the Algebra I Gateway exam in the seven Tennessee high schools.

Table 6

*Descriptives for English Language Learners with Different First Language Passing Algebra I Gateway Exam*

| Algebra I Proficient/Advanced | <i>n</i> | <i>M</i> | <i>SD</i> |
|-------------------------------|----------|----------|-----------|
| Amharic                       | 33       | 509.91   | 44.02     |
| Arabic                        | 178      | 506.88   | 52.76     |
| Kurdish                       | 137      | 480.38   | 53.83     |
| Somali                        | 93       | 480.08   | 53.68     |
| Spanish                       | 966      | 492.21   | 51.74     |
| Vietnamese                    | 27       | 543.19   | 56.76     |

Table 7 gives the mean and standard deviation for ELL students with different first languages who passed the English II Gateway exam.

Table 7

*Descriptives for English Language Learners with Different First Language Passing English II Gateway Exam*

| English II Proficient/Advanced | <i>n</i> | <i>M</i> | <i>SD</i> |
|--------------------------------|----------|----------|-----------|
| Amharic                        | 31       | 493.48   | 43.04     |
| Arabic                         | 166      | 498.85   | 48.79     |
| Kurdish                        | 170      | 494.34   | 51.38     |
| Somali                         | 61       | 470.54   | 60.18     |
| Spanish                        | 649      | 495.19   | 44.71     |
| Vietnamese                     | 49       | 515.84   | 38.64     |

An ANOVA was performed to test for any significant differences in the two Gateway exam scores based on first language. For Algebra I, there were significant differences between Amharic and Kurdish students and Amharic and Somali students at the 0.01 level. The Amharic students performed better than the Kurdish students ( $p = .0035$ ) and Somali students ( $p = .0048$ ). There were also significant differences between Arabic and Kurdish, Arabic and Somali, Arabic and Spanish, and Arabic and Vietnamese students, at the 0.01 level. The Arabic students performed higher than the Kurdish ( $p < .0001$ ), Somali ( $p < .0001$ ), and Spanish ( $p = .0006$ ) students, but lower than the Vietnamese ( $p = .0008$ ) students. There was a significant difference, at the 0.01 level, between the Kurdish and Vietnamese students. The Vietnamese students outperformed

the Kurdish ( $p < .0001$ ), Arabic ( $p = .0008$ ), Spanish ( $p < .0001$ ), and Somali ( $p < .0001$ ) students.

For English II, there was a significant difference, at the 0.01 level, between Arabic and Somali students. The Arabic students scored higher than the Somali students ( $p < .0001$ ). There were significant differences, at the 0.01 level, between Kurdish and Somali, and Kurdish and Vietnamese students. The Kurdish students scored higher than the Somali students ( $p = .0007$ ), but lower than the Vietnamese ( $p = .0049$ ). There were also significant differences between Somali and Spanish students, and between Somali and Vietnamese students. The Somali students scored lower than both the Spanish ( $p < .0001$ ) and Vietnamese ( $p < .0001$ ) students. Finally, there was a significant difference between the Spanish and the Vietnamese students, with the Vietnamese scoring higher than the Spanish ( $p = .0031$ ).

### Null Hypothesis 3

*There will be no statistically significant difference, at the  $p \leq .01$  level, between the first languages and the Algebra I and English II Gateway scores of the English language learners.*

The results of the ANOVA for Algebra I and English II scores revealed a  $p$ -value less than .0001 and a power of 1.000, indicating that the test had a 100% ability to detect a significant difference. In the Fisher's post-hoc test, a significant difference was found in the Gateway scores between languages. The table in Appendix A displays the results of

Fisher's PLSD for both Algebra and English. Based on the findings of this analysis, Null Hypothesis 3 was rejected.

#### Research Question 4

*What is the association, if any, between English language learners' ethnicity and their Algebra I and English II Gateway scores?*

Table 8 gives the means and standard deviations for the students of four different races who passed the Algebra I Gateway exam.

Table 8

*Descriptives for English Language Learners of Different Ethnicities Passing Algebra I Gateway Exam*

| Algebra I Proficient/Advanced | <i>n</i> | <i>M</i> | <i>SD</i> |
|-------------------------------|----------|----------|-----------|
| Asian                         | 275      | 536.27   | 53.27     |
| Black                         | 312      | 492.37   | 53.46     |
| Hispanic                      | 1097     | 496.57   | 52.79     |
| White                         | 484      | 507.68   | 54.70     |

An ANOVA was performed to examine whether there was any significant differences in the Algebra I Gateway scores of the English Language Learners based on ethnicity or race. The school district categorized its student body into four major ethnic groups: They were Asian, Black, Hispanic, and White. The Asian group included students from Vietnam, Korea, China, Philippines, Laos, Thailand, India, and Pakistan.

The Black students were from different parts of the African continent such as Ethiopia, Somalia, Ghana, Eritrea, to name a few. Students from different parts of Europe, Egypt, Iran, Iraq, and Kurdistan were designated as White. Students from all the Spanish speaking countries fell under the Hispanic group.

The ANOVA revealed a statistically significant difference in Algebra I Gateway scores, at the 0.01 level, between the following groups: Asian students performed significantly higher than Black ( $p < .0001$ ), Hispanic ( $p < .0001$ ), and White ( $p < .0001$ ) students, and White students performed significantly higher than Black ( $p < .0001$ ) and Hispanic ( $p = .0001$ ) students. Table 9 gives the means and standard deviations for students of four different races who passed the English II Gateway exam.

Table 9

*Descriptives for English Language Learners of Different Ethnicities Passing English II Gateway Exam*

| English II Proficient/Advanced | <i>n</i> | <i>M</i> | <i>SD</i> |
|--------------------------------|----------|----------|-----------|
| Asian                          | 206      | 514.29   | 49.61     |
| Black                          | 220      | 494.00   | 53.77     |
| Hispanic                       | 655      | 496.70   | 44.17     |
| White                          | 424      | 505.72   | 50.00     |

An ANOVA was performed to investigate whether there was any statistically significant difference in the English II Gateway scores among the four major ethnic groups. It was found that there was a statistically significant difference on the English II

Gateway exam, at the 0.01 level, among the following groups: Asian students performed significantly higher than Black ( $p < .0001$ ) and Hispanic ( $p < .0001$ ) students, and the White students performed significantly higher than Black ( $p = .0034$ ) and Hispanic ( $p = .0027$ ) students.

An ANCOVA was conducted to determine if there was a significant difference in the performance of the four major ethnic groups based on the length of residence in the USA. However, when length of residence was introduced as a covariate, there was no statistically significant difference, at the 0.01 level, in the performance among the four ethnic groups.

#### Null Hypothesis 4

*There will be no statistically significant difference, at the  $p \leq .01$  level, between the ethnicity and the Algebra I and English II Gateway scores of the English language learners.*

The ANOVA with race as the independent variable revealed a  $p < .0001$  and a power of 1.000, indicating that the test had a 100% ability to detect a significant difference. Fisher's post-hoc test revealed that, overall, Asian and White ethnic groups performed significantly better than their Hispanic and Black counterparts on both the Algebra I and English II Gateway exams. Based on the findings of this analysis, Null Hypothesis 4 was rejected. The table in Appendix B displays the results of the ANOVA.

### Research Question 5

*What is the association, if any, between English language learners' length of residence in the U.S.A. and their Algebra I and English II Gateway scores?*

A simple linear regression analysis was performed to test for any statistically significant relationship between the Algebra I and English II Gateway exam scores and the number of months the English Language Learners had resided in the USA. The analysis revealed no statistically significant relationship, at the 0.01 level, between the English language learners' Gateway scores and their length of residence (in months) in the USA.

### Null Hypothesis 5

*There will be no statistically significant difference, at the  $p \leq .01$  level, between the length of residence in the USA and the Algebra I and English II Gateway scores of the English language learners.*

A simple linear regression analysis was performed using gender and length of residence in the USA as the two independent variables for each of the two Gateway exams. For the analysis, length of residence was measured as months in the USA. There was no particular underlying reason for the order in which these two variables were included in the analysis. This was because order of variable inclusion had no significant impact on the outcome of the analysis, in a simple regression. As explained in Chapter III, only these two variables could be included in the analysis as these were continuous variables. The rest of the variables could not be included in the regression analysis as

they were all nominal variables. These two predictors accounted for less than a tenth of one percent of the variation in the two Gateway scores ( $R^2 = .001$ ). Both gender and months in the USA did not demonstrate any significant effect on the Gateway scores. There was no significant correlation between months in the USA and Algebra I. The  $p$ -values for Algebra I and English II were .07 and .41, respectively, which were much higher than the significance level of 0.01. Based on the findings of this analysis, Null Hypothesis 5 was retained. Table 10 displays the results of the linear regression for months in the USA in the analysis.

Table 10

*Linear Regression with Months in the USA as Independent Variable*

| Exam       | Correlation | $p$ |
|------------|-------------|-----|
| Algebra I  | -.14        | .07 |
| English II | -.06        | .41 |

Chapter V will offer conclusions and recommendations for future research.

## CHAPTER V

### SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to analyze whether there were any significant associations between the academic achievement of English Language Learners, as measured by the Gateway exams in Algebra I and English II, and certain background variables: gender; ethnicity; first language; length of residence in USA; and SES, based on free or reduced lunch. Regression analyses and analyses of variance were conducted to determine any significant relationships or differences.

#### Summary of Findings

The analyses focused on five research questions and five corresponding null hypotheses. Seven high schools which offered ELL programs that were located in a Tennessee Metropolitan school district were chosen for the study. The data for 5,000 students were included in the study. The data were received in a large comma delimited file. The data included information for the years 2004-2007. This data were imported into Statview for analysis.

*Research Question 1*

*What is the association, if any, between English language learners' gender and their Algebra I and English II Gateway scores?*

An initial simple regression revealed that there was no significant relationship between gender and either of the two Gateway scores. The  $R^2$  for Algebra I was 1.363E-4 and that for English II was .001. Next, a regression analysis was conducted using gender and length of residence in the USA as the two independent variables for each of the two Gateway exams. Gender did not have a significant association independently, or in combination, with the length of residence to the academic achievement of the English language learners.

*Research Question 2*

*What is the association, if any, between English language learners' SES and their Algebra I and English II Gateway scores?*

An ANOVA was performed to test for significant differences in the Gateway exam scores between students getting free lunch and students getting reduced lunch. For Algebra I, there was no significant difference in the performance of students on free or reduced lunch at the 0.01 level. For the English II scores, there was a significant difference in the scores between students on free and reduced lunch, at the 0.01 level. Students on reduced lunch scored significantly higher than the students on free lunch ( $p = .0007$ ).

*Research Question 3*

*What is the association, if any, between English language learners' first language and their Algebra I and English II Gateway scores?*

An ANOVA was performed to test any significant differences in the two Gateway exam scores based on first language. For Algebra I, there were significant differences between Amharic and Kurdish students and Amharic and Somali students, at the 0.01 level. The Amharic students performed better than the Kurdish ( $p = .0035$ ) and Somali students ( $p = .0048$ ). Next, the Arabic students performed higher than the Kurdish ( $p < .0001$ ), Somali ( $p < .0001$ ), and Spanish ( $p = .0006$ ) students, but lower than the Vietnamese ( $p = .0008$ ) students. The Vietnamese students outperformed the Kurdish ( $p < .0001$ ), Arabic ( $p = .0008$ ), Spanish ( $p < .0001$ ), and Somali ( $p < .0001$ ) students.

For English II, there was a significant difference, at the 0.01 level, between Arabic and Somali students. The Arabic students scored higher than the Somali students ( $p < .0001$ ). Next, the Kurdish students scored higher than the Somali students ( $p = .0007$ ), but lower than the Vietnamese students ( $p = .0049$ ). Also, the Somali students scored lower than both the Spanish ( $p < .0001$ ) and Vietnamese ( $p < .0001$ ) students. Finally, there was a significant difference between the Spanish and the Vietnamese students, with the Vietnamese students scoring higher than the Spanish students ( $p = .0031$ ).

*Research Question 4*

*What is the association, if any, between English language learners' ethnicity and their Algebra I and English II Gateway scores?*

The school district categorized its student body into four major ethnic groups: Asian, Black, Hispanic, and White. There were significant differences in performance among these ethnic groups. The ANOVA revealed a statistically significant difference, at the 0.01 level, between the following groups: On the Algebra I Gateway exam, the Asian students performed significantly higher than Black ( $p < .0001$ ), Hispanic ( $p < .0001$ ), and White ( $p < .0001$ ) students, and the White students performed significantly higher than Black ( $p < .0001$ ) and Hispanic ( $p = .0001$ ) students. On the English II Gateway exam there was a statistically significant difference, at the 0.01 level, among the following groups: Asian students performed significantly higher than Black ( $p < .0001$ ) and Hispanic ( $p < .0001$ ) students, and White students performed significantly higher than Black ( $p = .0034$ ) and Hispanic ( $p = .0027$ ) students. An ANCOVA with length of residence as covariate revealed no statistically significant difference, at the 0.01 level, in performance among the four ethnic groups.

*Research Question 5*

*What is the association, if any, between English language learners' length of residence in U.S.A., and their Algebra I and English II Gateway scores?*

A simple linear regression analysis with gender and months in the USA revealed no statistically significant relationship at the 0.01 levels between the English language learners' Gateway scores and their length of residence (in months) in USA. The *p-values*

for Algebra I and English II were *.07* and *.41* respectively, which were much higher than the significance level of 0.01.

### Conclusions

1. Gender was not significantly associated with the English language learners' academic success.
2. Students on reduced lunch scored significantly higher than students on free lunch. Poorer home literacy, including limited access to reading materials or modeling of reading by adults in the home, has been cited as a main causal variable leading to reduced academic performance in low SES children (Torgesen, 2000; White, 1982). Most of the immigrant students come from highly impoverished backgrounds, with both parents working two or more jobs to maintain the family. A vast majority of the English language learners fall in the free or reduced lunch category.
3. There were significant differences in the academic success of the speakers of different languages. The Vietnamese students outperformed all other language speakers. The Somali students scored significantly lower than the students in other language groups.
4. Once again, the Asian students' achievement was significantly higher than that of the other ethnic groups. Black students performed significantly lower than students from the other ethnic groups. White and Hispanic students fell somewhere in the middle. It is necessary to analyze academic success based on

the countries that these students belong to within each ethnic group. For example, within the white ethnic group, it is necessary to study the differences between the Egyptian and Iraqi students or the Kurdish and Egyptian students. Similarly, students from Cuba, Mexico, Honduras, Guatemala, Brazil, Costa Rica, Puerto Rico, are all termed Hispanic, and it is necessary to study the differences among these groups.

5. The length of residence of the students in the USA did not reveal any significant results. This may be the result of inadequate data for all the years considered in the study.

#### Recommendations to Improve Practice

1. The school district should maintain a consistent, clear, and updated record of all long-term data related to the English language learners.
2. The following information should be gathered and made available to the educators of English language learners: Age on arrival, years of schooling in primary language, years of previous formal schooling, and years of development of academic English.
3. English language learners should be instructed by highly qualified professionals who have received specialized training in ESL.
4. English language learners should be provided adequate opportunities to use their first language (L1) in the second language classroom. Use of L1 should be seen as an aid and support to the acquisition of the second language.

5. Sheltered content teachers should be provided professional development opportunities to become familiar with the best practices for teaching English language learners.
6. ELL newcomers with no English language background should be provided a rigorous and structured curriculum.
7. There should be a framework of equitable assessment of all English language learners. It is necessary to have reasonable expectations of the English language learners and not hold them to the same standard as students who have been speaking English all their lives.
8. The English language learners should be provided access to technology and high quality educational materials.
9. Theoretical ideas based on sound research should be translated to best practices in the classroom. For example, research shows that it takes a student seven to ten years to develop Cognitive Academic Language Proficiency (CALP).  
Curriculums and assessments should be developed along the guidelines of such significant research.
10. Every educator and administrator must be cognizant of the diversity among the ELL population, and not consider it a monolithic group with a single defining characteristic: namely, having a home language other than English.

### Recommendations for Further Research

1. Longitudinal studies should be conducted in order to assess the progress of English language learners over a period of time.
2. Studies should be conducted to analyze the differences in ELL performance within the classrooms and on standardized assessments.
3. Culture studies should be done within a school district to analyze aptitude and motivational factors pertaining to a language/ethnic group.
4. Motivation research should be conducted to assess differences in attitude towards educational attainment between genders, cultures, ethnic, and language groups.

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## APPENDIX A

## ANOVA TABLE FOR FIRST LANGUAGE

*ANOVA – First Language*

| Languages           | <i>P</i> |          |
|---------------------|----------|----------|
|                     | Algebra  | English  |
| Amharic, Arabic     | .7594    | .5601    |
| Amharic, Kurdish    | .0035*   | .9262    |
| Amharic, Somali     | .0048*   | .0272    |
| Amharic, Spanish    | .0554    | .8429    |
| Amharic, Vietnamese | .0140    | .0387    |
| Arabic, Kurdish     | < .0001* | .3794    |
| Arabic, Somali      | < .0001* | < .0001* |
| Arabic, Spanish     | .0006*   | .3725    |
| Arabic, Vietnamese  | .0008*   | .0266    |
| Kurdish, Somali     | .9654    | .0007*   |
| Kurdish, Spanish    | .0130    | .8313    |
| Kurdish, Vietnamese | < .0001* | .0049*   |
| Somali, Spanish     | .0322    | < .0001* |
| Somali, Vietnamese  | < .0001* | < .0001* |
| Spanish, Vietnamese | < .0001* | .0031*   |

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\* Significant at the 0.01 level

APPENDIX B

ANOVA TABLE FOR ETHNICITY

*ANOVA – Ethnicity*

| Ethnic Groups   | <i>p</i> |          |
|-----------------|----------|----------|
|                 | Algebra  | English  |
| Asian, Black    | < .0001* | < .0001* |
| Asian, Hispanic | < .0001* | < .0001* |
| Asian, White    | < .0001* | .0360    |
| Black, Hispanic | .2200    | .4717    |
| Black, White    | < .0001* | .0034    |
| Hispanic, White | < .0001* | .0027    |

\* Significant at the 0.01 level