ENGLISH LEARNERS AND STUDENTS WITH DISABILITIES: A TEXAS SCHOOL DISTRICT PERSPECTIVE

A Dissertation

by

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ABSTRACT

Disproportionate enrollment of minorities in special education has been an equity issue in the United States for decades (Artiles, et al., 2010), often leading to case law and policy changes to provide corrective action. For example, in the 2004 amendments to the Individual with Disabilities Act (IDEA), the federal government mandated states to monitor such disproportionality. Despite years of examination, researchers have continued to explore complex issues of disproportionate enrollments because the problem persists despite policy and legal changes to the system. I examined English learners (Els) because the student group has not received as much attention in the literature, especially when compared to student race or gender (Waitoller et al., 2010).

I extended current research of ELs in special education by exploring the relationship between ELs and special education, and how student or school characteristics play a role in determining special education qualification. Enrollment of any student population can be significantly impacted by, and varied, at localized contexts. To further current literature, I examined the local enrollment patterns of a large, urban school district in the Southwest from 2014-2018.

The goals of the study were to (a) determine if there was a disproportionate enrollment of ELs in high-incidence categories of special education including specific; (b) determine if students were less likely or more likely to be classified as EL and a student with a disability (SWD) as their English-speaking peers, and (c) to determine the probability of a non-native English speaker qualifying as special needs in a large urban school district. I used composite indices, risk indices, logit regression, and multilevel probit modeling for the analysis. EL students were underrepresented and less likely to be enrolled in special education for all five years included in the study compared to their white and native English speaking peers. If EL students qualified for special education services, the EL students were most likely to have a disability of speech impairment. Further research should examine practices at the school level to determine if bias or exceptions are given to EL students before and during the special education qualifying process.

DEDICATION

In 2017, I was literally saved from death. A few months later, I was given a second chance at life with a heart transplant. I often get asked why I think I was given another chance. I deeply feel that I advocate for others who don’t have a voice as loud as I do. I was given more time because I have more work to do. This dissertation is a representation of said work.

I dedicate this dissertation to the vulnerable populations which I use my voice to elevate theirs. It will be an honor to advocate for equity in education on your behalf. I also dedicate this dissertation to my unknown heart donor and their family. I may not know them, but their gift gave me the ability to complete this dissertation and continue my life of service.

I also cannot submit this dissertation without acknowledging the profound loss that occurred in the final steps. I lost my father a few days before I was scheduled to defend my research. He once told me that calling me Doctor was on his bucket list. He didn’t quite make it, but I know he must be smiling down on me from above. I miss you, Daddy. This one is for you too.

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I would also like to thank my family, friends, colleagues, and my transplant team, for their support over the past few years. They have been patient, but assertive, in their help to make sure I never gave up; even when I was struggling with balancing my non-academic life with this dissertation, or my transplant recovery.

Finally, thank you to my husband, sons, and parents. You have patiently been by my side while I kept promising that I would finish my research. You sacrificed a great deal to help me, year after year. There are no words I can write to show my appreciation, but I hope I have made you proud.

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All other work conducted for the dissertation was completed by the student independently.

NOMENCLATURE

BEA	Bilingual Education Act
ED	Emotionally Disturbed
EL(s)	English Language Learner(s)
FAPE	Fair and Appropriate Public Education
DL	Dual Language
HPI	Hawaiian/Pacific Islander
IEP	Individual Education Plan
ID	Intellectually Disabled
IDEA	Individuals with Disabilities Act
LD	Learning Disabled
LPAC	Language Proficiency Assessment Committee
MD	Multiple Disabilities
PIEMS	Public Education Information Management System
PL 94-142	Public Law 94-142; amendment of the American Handicapped Act of 1975
OHI	Other Health Impaired
OSEP	U.S. Office of Special Education Programs
OSERS	U.S. Office of Special Education and Rehabilitative Services
SWD	Students with Disabilities

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CHAPTER I

INTRODUCTION

Background of the Study

For years, general disproportionality issues have been raised and studied in educational contexts. The term “disproportionate enrollment” has been applied to a student group that is over- or under-represented in a program or area as compared to the group’s representation in the general education (Gibb & Skiba, 2008). Despite decades of research conducted in this area, equity issues around disproportionality have continued to be complex (Artiles et al., 2010; Skiba et al., 2008; Sullivan & Bal, 2013), with most studies focused on racial disparities. Waitoller et al. (2010) argued there was an emerging trend of studies focused on the relationship between special education and students who do not speak English as their native language. It is important to continue to analyze the relationship between student demographics and special education enrollment as national demographics continue to shift towards a more diverse student body.

The research on English learners (EL) enrollment in special education has been limited (Linan-Thompson, 2010; Sullivan, 2011, Sullivan & Bal, 2013; Valenzuela et al., 2006; Waitoller et al., 2010). However, published examinations into local contexts have indicated a variation of EL special education enrollment at the state and district levels (Sullivan, 2011; Sullivan & Bal, 2013).

Problem Statement

Nationally, the number of EL students enrolled in public school systems has been on the rise. In 2008, there was 8.6 percent of students participating in programs for

English language learners in public schools. Ten years later, this percentage increased to 10.1 percent (U.S. Department of Education [ED], 2019). Apart from Washington D.C. and Florida, most of the states with the highest EL population have been in the west.

Using the Child Count information from ED*Facts* Data Warehouse (ED, 2019), EL enrollment in special education has been rising. According to the 40th Annual Report to Congress and (Office of Special Education and Rehabilitative Services [OSERS], 2018), the national rate for students enrolled in special education services grew from 8.4% to 9.0% between the years 2013 to 2017. The dual classification of EL and special education enrollment was also slowly rising (see Table 1). A thorough examination of the EL population in special education programming would help ensure equitable educational opportunities.

Table 1

National IDEA, Part B Ages 6 to 21, Child Count Enrollment Percentages, 2013-2017

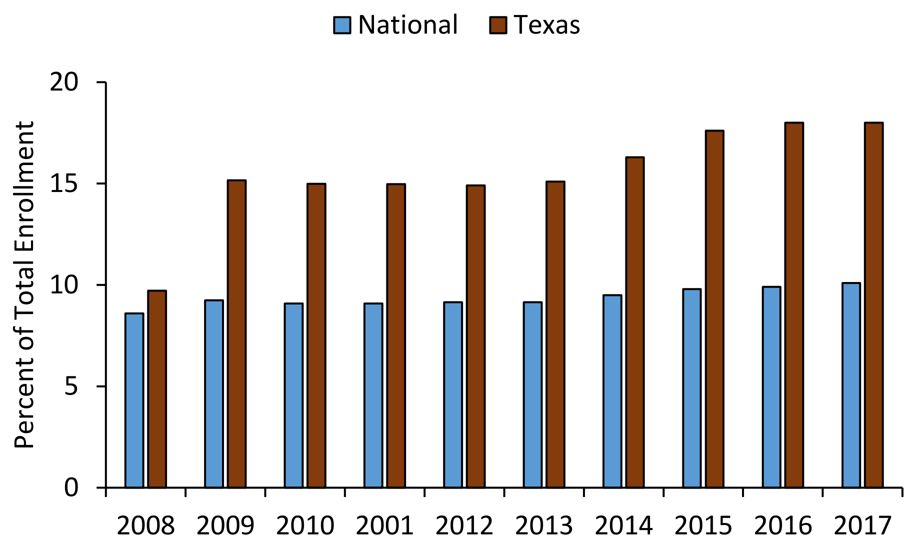
Year	Special Education Enrollment	EL and Special Education Enrollment
	%	%
2012–2013	8.4	1.6
2013–2014	8.5	2.4
2014–2015	8.7	2.6
2015–2016	8.9	2.7
2016–2017	9.0	2.9

Note: Sourced from the 40th Annual Report to Congress (ED, 2018); IDEA Section 618 Data Products: State-Level Data Files – Child Count 2011, 2012, 2013, 2014, 2015, 2016

I focused the study on a school district in Texas, located in the Southwest region of the United States. Texas' EL population is higher than the national average (see Figure 1). Additionally, the enrollment growth of Texas Els outpaced the national growth over the past ten years.

Figure 1

Percentage of Public School Students Participating in Programs for English Language Learners: Years 2008-2017



Note: In 2008, 8.6% of the total U.S. public school enrollment participated in a program for English language learners, compared to 9.7% of Texas enrolled students, a difference of 0.09 percentage points. In 2017, these percentages had increased to 10.1% and 18%, respectively. Texas had 7.9 more percentage points than the national average. Calculated using ED (2019). *Number and percent of English proficient (EP) and limited English proficient (LEP) students ages 6 through 21 served under IDEA, Part B, by educational environment and state*.

Understanding the relationship between EL students and special education is necessary because the EL student population has been at risk for misidentification and enrollment in special education programs (Sullivan, 2011; Sullivan & Bal, 2013). A common disproportionate threshold of a student population enrollment is 10% over or under the proportion of their enrollment in general education (Chinn & Hughes, 1987; Skrla et al., 2004). While IDEA required states to identify disproportionate enrollments, the federal government allowed states to choose their thresholds (IDEA, 2004). My study took place in Texas, and the Texas Education Agency (TEA, 2015) applies a risk difference of 2.5, which is far greater than the suggested threshold of 10% over or under, using a composite index (Chinn & Hughes, 1987; Skrla et al., 2004).

My study was focused on special education enrollment patterns of EL students, using Texas data. Despite the concentration of disproportionate representation with research focused on race (Artiles et al., 2005; Waitoller et al., 2010), it is critical to examine other students who may be vulnerable, including EL students from different ethnicities beyond Hispanic. Enrollment patterns marked pockets of concern and implied a potentially substantial issue. For example, even if EL students were proportionally represented at the state level in Texas, why did the EL special education enrollment remain steady despite a decrease in the total state special education enrollment rates?

However, Sullivan (2011) and Sullivan and Bal (2013) asserted inequities were more likely to exist within local and regional enrollment contexts. Being aware of current enrollment patterns within a district could enable school leaders and scholars to monitor EL special education enrollment to provide interventions if the outcomes were found to be inequitable. Oswold and Coutinho (2006) contended that if the "identification confers some benefit, or imposes some stigma, then the system is not only working differently, but it is discriminatory" (p. 1). Even if the treatment itself was not intentionally discriminatory, but the system processes unjustly and disproportionately affected a group, the treatment could be considered a disparate impact (Shoben, 2003).

According to the TEA (2015) methodology, Texas has revised the threshold used to determine disproportionality based on previous state data. The threshold changes may further mask issues regarding disproportionality if minorities were placed in special education programs at unproportionable rates. Using a large critical value or large acceptable risk ratio threshold has led to disproportionality concerns within districts because the disproportionality numbers could be underreported.

Disproportionate special education enrollment is a complex and nuanced issue. Previous research attempted to tease out some prevalent problems. Still, the systems that lead minorities to be disproportionately enrolled in special education programs have often been nuanced and relied on local, state, and federal guidelines. I examined a local school district with a high EL student population to test if their enrollment rates matched national patterns. Examinations of the microenvironments are important to disaggregate school outcomes to identify potentially misidentified students or inequitable processes. The school outcomes could help determine if students are victims to a disparate impact by the qualifying process.

Significance of the Study

I chose to focus the study in a Texas, because it has one of the largest EL populations in public education. Not only does Texas have one of the highest enrollments of EL students, but the enrollment numbers have increased over the years. Moreover, the EL population has grown at a rate faster in Texas than most other states (Marshall & Oliva, 2010). This growth provided a unique landscape to explore the relationship between EL students and special education enrollment. The enrollment rate of special education students remained stable from 2013-2017, with a jump in 2018. The EL enrollment also grew between these same years. However, when I examined the enrollment of EL students in special education programming, the enrollment percentage was not stable, with both declines and increases between 2013-2018. Proportional enrollment distribution of EL, Special Education, and EL students in Special education programs were aggregated at the state level (see Table 2).

Table 2

Texas Special Education Enrollment Between 2012–2013 and 2016–2017

Year	EL Enrollment	Special Education Enrollment	EL Special Education Enrollment
	%	%	%
2012–2013	17.0	8.7	7.5
2013–2014	17.5	8.6	7.4
2014–2015	18.1	8.6	7.1
2015–2016*	18.5	8.7	7.5
2016–2017*	18.9	8.9	7.1
2017-2018*	18.8	9.2	8.6

Note: Sourced from the Texas Education Agency, 2020.
*Indicates some categories were masked to complete with Family and Education Rights and Privacy Act and the percentages are approximate.

I continued previous research that explored the representation of EL students in special education from around the country by focusing on a local context given the variation observed in other local context studies (Sullivan, 2011; Sullivan & Bal, 2013). Using a large urban school district, I explored data to determine if EL students are at risk of being classified as disabled when compared to their White and native English-speaking peers, based on previous enrollment patterns. Furthermore, I investigated if the state aggregate data had the potential to hide disproportionate local enrollments, based on the local enrollment rates.

Sample District

Several considerations were given to the enrolled student population when identifying the district to examine. The factors included were the district's EL enrollment, special education enrollment, size, and location. Adding to these considerations was a previous special education evaluation completed in 2011, which provided a history of enrollment patterns for EL students within special education programs.

In 2014–2019, the sample district had 30% - 32% of all enrolled students classified as EL (Disguised District Profile, 2019), and the EL students spoke almost 100 languages (Disguised District webpage, 2020). The sample district had a higher than average EL enrollment proportion, based on the distribution of all Texas school districts (See Table 2). However, the school district had slightly below the state average for special education enrollment (Disguised District Profile, 2018, 2019).

A special education evaluation by an independent evaluator (H2011)[1] found Hispanic EL students were underrepresented in the district. However, when looking at the proportion rates at the school level, the researchers found EL students were underrepresented at the elementary level (odds ratio of 0.6) and overrepresented at the middle (odds ratio of 1.7) and high schools (odds ratio of 4.6). For high school Hispanic EL students, the categories of learning disabled (odds ratio of 4.7) and intellectually disabled (odds ratio of 5.4) were remarkably high. Following the 2011 evaluation and citations from TEA concerning overrepresented student populations in special education (H.T. et al., 2011), the district reported the EL special education population at the secondary level decreased steadily over the past five years and was currently at 12.7%,

[1] The authors and the district have been disguised for confidentiality reasons.

from 31.0% in 2012. The district reported this was due to an increase in identifying Hispanic EL students needing services earlier in the elementary grades (Research and Accountability, 2015[2]). A separate 2016 progress report published by the district did not indicate if the EL population remained overrepresented at the middle and high school levels, or if the increase in identification rates in the lower grades impacted the EL representation.

Hispanic students did have several demographic areas that were correlated to their likelihood of special education. For example, the researchers found the demographics of the student body did correlate with the possibility of enrollment of Hispanic students in special education (H.T. et al., 2011). Hispanic students were more likely to be classified as special education when they represent a lower percentage of the student body makeup. Moreover, Hispanic students' level of English proficiency were strongly related to their likelihood of special education identification (H.T., E.H., G.T., & M.E., 2011). Language proficiency is important because over 90% of the EL population are Hispanic students, meaning the EL population has a greater likelihood of being classified as special education when schools have higher percentages of ethnicities/races other than Hispanic.

The 2011 independent report also found Hispanic students were more likely to take a modified version of the state standardized test than their White special education peers (H.T. et al., 2011). Notably, the report found a high proportion (80%) of special

[2] The authors and school district name have been omitted to protect confidentiality.

education students attended few to none of the mainstream classes. In summary, the report found "that relatively large numbers of African Americans and Hispanic LEP [EL] students may be inappropriately identified as needing special education services" (H.T. et al., p. 18).

Purpose of the Study

The purpose of the study was to explore the relationship between students classified as EL and qualified for special education services, as compared to their native English-speaking peers, using a local context from a large urban school district in Texas. The second purpose of the study was to determine the risk of EL students enrolled in special education within the district, as compared to their native English-speaking peers.

My goal with the study was to address a gap in understanding local context on factors impacting special education enrollment. Disproportionate studies focused on the EL population within local contexts have yet to be explored on a large scale in published literature (Linan-Thompson, 2010; Sullivan, 2011; Sullivan & Bal, 2013; Valenzuela et al., 2006; Waitoller et al., 2010). Specifically, within my study, I analyzed this issue within an area known for a racial, ethnic, and linguistically diverse student population. As the student demographics continue to evolve, I provided a spotlight on an area primed for risk of disproportionate enrollment given the state demographic shifts. The study serves as a beacon for the local district to determine if the state growth in both the Hispanic and non-native language speakers in the region translated as a risk of being disproportionately enrolled in special education programs.

Theoretical Framework

I was motivated by social justice and the critique of equity within the educational field. “For a field built on the principle of fairness…and grounded in the rhetoric of the civil rights movement, ongoing disproportionality strongly indicates systematic problems of inequity, prejudice, and marginalization within the education system” (Sullivan, 2011, p. 318). I built on social justice frameworks to explore “…the equal treatment of non-equals or the unequal treatment of equals” (Irby & Lunenburg, 2014, p. 8). Irby and Lunenburg (2014) explained that while justice and equity are often used interchangeably, equity provides a fairness aspect to the treatment of others.

Oswald and Coutinho (2006) identified two common positions for the cause of disproportionate enrollment of minority students: (a) the educational system is inherently biased or discriminatory or (b) disproportionate enrollment is a result of social factors which causes some groups to have higher rates of disabilities. Marshall and Oliva (2010) explained educational inequities are not a product of deficiencies within a student; rather, inequities result from “…systematic organizational practices and policies endemic to schools and administrator practice that have not been analyzed or acted on…” (p. 7). These authors continued that inequities exist within the educational system, even if those inequities were subconsciously applied, unintentional, or covert.

Following the logic that educational systems are biased, several authors have argued classrooms are, in and of themselves, laboratories where solutions to social equality problems can be challenged and tested (Bowles & Gintis, 2000; Dewey, 2012;

Urban & Wagoner, 2000). Marshal and Oliva (2010) agreed and hypothesized that schools could remedy the educational inequities through continued monitoring and evidence-based interventions.

Disparate Impact Theory

Disparate impact theory is concern with how biased systems impact one group differently from another, rather than intentional treatment from stakeholders. The framework has historically applied in class action lawsuits regarding employment discrimination, particularly when individuals with disabilities have legal standing under the Americans with Disabilities Act (Shoben, 2003), and statistical analysis has been used for evidence of discriminatory outcomes. More recently, the disparate impact theory was applied by the Obama administration as a framework to understand the impact of school discipline (Zehr, 2010). Disparate impact is unconcerned with the motivation of those in power, but rather, it is squarely focused on the "unjustified disadvantage caused by a [sic] device that disproportionately affects a group defined by race, color, sex, or national origin, disability, and maybe age" (Shoben, 2003, p. 601). Slightly different from disparate impact is disparate treatment. Disparate treatment is the overt application of systematic policies, which "produce a treatment that disfavors one group" (Dougherty et al., 2002, p. 101).

Conversely, disparate impact asserts the systematic policy may appear to be neutral, but in practice, "improperly disfavors a particular individual or group" (Dougherty et al., 2002, p. 102). Essentially, if a system is not purposefully designed to be biased, but created discriminatory practices, the system must be addressed to prevent a disparate outcome. I used the disparate impact theory to analyze if a school system's policies led to a disadvantage for EL students, even though the guidelines appeared to be non-discriminatory.

Critics of disparate impact analysis are concerned the theory led states and schools to be concerned with the numbers, rather than the factors, associated with the initial discrimination (Rosenthal, 2016a; Zehr, 2010). For example, in 2004, the TEA created a special education benchmark percentage for the local education agencies to reduce the overrepresentation of minorities in special education. In 2016, promoted by an investigative newspaper report (Rosenthal, 2016a), special education advocates have pushed to have the special education benchmark removed. In November 2016, the U.S. Department of Education ordered the TEA to eliminate the special education benchmark. Several school districts actively investigated whether the maximum benchmark led to students being denied special education services (Rosenthal, 2016b). DeMatthews and Knight (2019) demonstrated a clear decline in Texas' special education enrollment as soon as the TEA special education benchmark was introduced, one that was not observed in other states. Most of the Texas districts had special education enrollment numbers just under the TEA benchmark, not over, suggesting districts enacted policies to ensure they were under the benchmark to avoid state consequences, such as a lower accountability rating. The authors attributed the Texas special education enrollment decline directly to the TEA benchmark.

Disparate impact is the next logical framework after understanding disparate access. When disproportionality occurs, it implies unequal access (Skiba et al., 2004) and unequal treatment for a group of students (Bollmer et al., 2007).

Using the disparate impact theoretical framework, I examined the relationship between EL students and special education within a large urban and diverse school district in Texas to determine if disproportionality existed within the district for Els. Understanding the impact of student and school factors at the local level is the first step to correcting any disproportionality concerns (Bollmer et al., 2007; Sullivan & Bal, 2013). School leadership can use the lens of critique to apply inclusive practices as corrective actions to restore equity among competing groups and provide power balance within school systems (McKenzie et al., 2007). Skrla et al. (2004) identified four potential areas often associated with programmatic inequities: “(1) special education, (2) gifted and talented education, (3) bilingual education, and (4) student discipline” (p. 146).

Commonly, this type of analysis at the school level is referred to as an equity audit (Skrla et al., 2004). Equity audits have a historical relationship to the civil rights movement in the United States and across the globe. They have been used by the U.S. Department of Education to ensure compliance with anti-discrimination regulations and ensure all students are achieving academic success (Skrla et al., 2004). An example of this tool in action on a large scale was the passage of the No Child Left Behind Act in 2001, which was a reauthorization of the Elementary and Secondary Education Act. Within this legislation, schools, local education agencies (districts), and state education agencies were required to report their accountability measures by study subgroup – including EL students – to ensure all student subgroups were progressing towards mastery. By reporting out subgroup student populations, the educational systems were forced to take responsibility for each student enrolled in school. Regarding special education programming, states only had to report on enrollment by race/ethnicity, time spent in the classroom, and special education disability (IDEA, 2004).

Even with attempts to monitor special education enrollment, there have been concerns when examining aggregated data. Sullivan (2011) maintained national data provided masked results regarding disproportionality in special education. As such, it is important to analyze the enrollment patterns within local contexts, often providing more varied results and a clearer understanding of the issue given the variance even between neighboring school districts (Skrla et al., 2004).

I attempted to further previous research, focusing on identifying inequities in special education as applied to non-native English-speaking students within in one local district. The study itself was an attempt to understand the problem and present local, contextual data to inform both scholarly research and school leaders of any disproportionate issues within local areas. I moved beyond the state-mandated critical value and applied an acceptable scholarly value to determine if EL students are disparately impacted within my school system.

Research Questions

I attempted to answer one overarching question: Were ELs disproportionately represented in special education programs during in a large urban Texas district? The following sub-questions provided structure to the analysis.

1. Were the EL special education enrollment disproportionate when compared to their White, English speaking, or minority, English-speaking peers?
2. What was the probability of a student being identified as special education as a function of their EL classification, controlling for the student and school characteristics?
3. What is the probability of an EL student who is co-identified as disabled being classified with a high incidence category of disability including specific learning disabled (SLD), emotional or behavior disorder (ED), and intellectually disabled (ID), and Speech, controlling for the student and school characteristics?

Limitations

Limitations are factors that prevent generalization to a population and are considered out of the control of the principal investigator (Lunenburg & Irby, 2008). I had the following limitations within my study:

1. The findings are limited to the local landscape and cannot be generalized to the state or national education systems.
2. Without a federal definition of disproportionately, states create their standard. As such, the definitions used to guide the measurement calculations to report disproportionately also vary among the states (Klinger & Edwards, 2006).

3. The disproportionality standard (Chinn & Hughes, 1987; Sklra et al., 2004) and measurements (Skiba et al., 2006; Sullivan, 2011; Sullivan & Bal, 2013) applied within this study are widely used in scholarly research, rather than the ones employed by the TEA. Therefore, the results may differ from any of the state inquiries.

TEA (2016) has used the same ethnicity and race definitions as the United States Federal Register (71 FR 44866) and does not differentiate between the various Hispanic and Latino ethnicities and cultures. For this study and the interpretation of the data provided by the school district, the term Hispanic is used to describe all individuals from Spanish-speaking backgrounds, such as Cubans, Mexicans, Puerto Ricans, Cubans, South, and Central Americans, or other Spanish culture or origin, regardless of race (p. 5).

Delimitations

Lunenburg and Irby (2008) described delimitations as boundaries on the scope and purpose of the study, which are self-imposed by the researcher. My goal of the study was to explore the enrollment relationship between special education and EL students to gain a better understanding of the educational placements in a large, urban school district in Texas. The study had the following delimitations:

1. The study included only one local district, rather than all the districts in the state. The sample restriction allowed for a targeted examination of enrollment patterns at the 283 schools within the local school district. Given the lack of variance of disproportionality results within districts, regions, and states (Sullivan, 2011),

disaggregating district data to the campus level presented a critical evaluation of local representation patterns.

2. I only examined the disproportionality rates for EL students. Most disproportionate research examines the relationship between race/ethnicity and program enrollment (Artiles et al., 2005; Waitoller et al., 2010). Although disproportionate EL enrollment in special education programs exists, a gap remains in the literature, particularly focusing on local contexts (Sullivan, 2011; Sullivan & Ball, 2013).

3. I examined four of the high disability categories for students aged 6-21. For the research project, only the categories of specific learning disabled (SLD), emotional or behavior disorder (ED), and intellectually disabled[3] (ID) and Speech Impairment were included. The categories were included because the eligibility process often requires an element of subjectivity (Cullinan & Kauffman, 2005; Harry et al., 2005; Kearns et al., 2005; Klinger & Harry, 2006; Knotek, 2003; Strand & Lindsay, 2009; Wilkinson et al., 2006) and has the highest rates of disproportionately, as compared to the categories involving physical disabilities.

Organization of the Study

The study is presented in five chapters. Chapter I contains the research topic, problem statement, purpose of the study, the significance of the study, a conceptual

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[3] Intellectually Disabled has been historically referred to as mentally retarded until October 5, 2010 with the passage of Public Law 111-256.

framework underlying the research methodology, research questions, limitations, and delimitations of the study.

Chapter II includes a historical overview of disproportionality, contributing factors of disproportionality, and research focused on the EL student group specifically. In Chapter III, I provide the study methodology, data collection, and measurements used to evaluate the enrollment of EL students in special education.

Chapter IV comprises the findings for the research questions and presents my analyses, including composite and risk indices, quantitative statistics, and hypothesis testing results. Chapter V includes a summary of the study and discusses the findings for the research question. The chapter is concluding with practice implications and suggestions for further research.

CHAPTER II

LITERATURE REVIEW

The focus of the study was rooted in decades of research, acknowledging that students of color have been placed at a higher rate into special education services than their White peers (Donovan & Cross, 2002). To counter this phenomenon, the United States passed revisions in the reauthorization of the IDEA in 2004 and in 2005, which mandated changes on how students were recommended for special education services. Additionally, the reauthorizations of IDEA strengthened the oversight requirements to track disproportionate special education enrollment at both the district and the state levels. If the Local Education Agencies (LEA) are found to have a disproportionate enrollment of a student subgroup, the 2004 IDEA reauthorization dictates the LEAs must allocate 15% of their special education funds towards intervention services. Despite the mandate to track special education disproportionality enrollment, the federal government did not provide a federal definition of disproportionality (Skiba et al., 2006). Many articles and research studies have dedicated to African American students being misidentified (Waitoller et al., 2010), however, an emerging trend has appeared in education exploring the representation of limited English speakers in special education.

It is important to reflect on the research that has attempted to define this issue and understand the factors that contributed to the overrepresentation of special education enrollment.

Overview of Disproportionate Representation

In academic scholarship, disproportionate enrollment refers to any enrollment that is not representative of the enrollment in the general education population. The term itself can be used to describe over-enrollment or under-enrollment. Disproportionate research primarily addresses a subpopulation that is overly represented in the area of concern. Therefore, I used the term “disproportionate” to indicate overrepresentation unless otherwise specified.

Donovan and Cross (2002), who conducted a study at the request of the National Research Council panel, cautioned against defining disproportionate enrollment in simplified terms because how the term is defined will determine whether a solution can be obtained. Meaning, if we only look at racial indicators as the problem, does it matter if students who have low socioeconomic status are overrepresented? Artiles et al. (2005) provided a broader explanation and defined the issue as the “extent to which membership in a given group affects the probability of being placed in a specific special education disability category” (p. 288). To further complicate the issue, Waitoller et al. (2010) explained that states do not have a consistent definition of overrepresentation. IDEA allows each state to determine a threshold if a student group is out of proportion.

While the subgroups were disaggregated by various student demographics, most of the research on disproportionate representation in special education focuses on racial profiles (Artiles et al., 2005) when clearly the educational system is far more complex (Donovan & Cross, 2002). Debates continue in hopes of ddeveloping a clearer understanding of the causes of the overrepresentation of historically marginalized students. Artiles et al. (2005) argued that overrepresentation is a systematic failure due to a magnitude of reasons from both the micro and macro levels, including district size, the size of the district's minority population, and demographic indicators. Hosp and Reschly (2004) emphasized that three reasons contributed to disproportionate enrollment rates, "labeling effects, segregation of placement, and presumed ineffectiveness of special education services" (p. 68). The relationship between demographic indicators, the eligibility process, and disproportionate rates, as they relate to the disproportionate enrollment of EL students in special education is provided in the next section.

Even with increased attention to overrepresentation in special education programs, some believe that the research continues to be narrowly focused and limited, considering how many variables influence the educational system and the students within that system. To begin, Artiles et al. (2005) and Donovan and Cross (2002) suggested that the published research tends to focus on disproportionality as it relates to overrepresentation in special education programs. Rarely do studies articulate the issue of underrepresentation of diverse students in gifted and talented programs. Donovan and Cross (2002) proposed that to address disproportionate enrollments in all programs, researchers need to attend to the educational system as a macro institution with complex micro factions. For example, Artiles et al. (2005) pointed out that most of the overrepresentation research is focused primarily on race as a determining or evaluative variable. They posited more research should highlight other diversity markers such as socioeconomic status and language proficiency. Valenzuela et al. (2006) asserted that even when looking at ethnicity, researchers should consider each one separately to understand the characteristics of that population to gain insight into the issue. Artiles et al. agreed that current research overestimates the homogeneity within ethnicities when looking at minority enrollment within special education programs. Because most studies are conducted using quantitative methods, Waitoller et al. (2010) suggested that more qualitative evaluations are needed to understand how both professional practices and local sociodemographic conditions affect the overrepresentation of minorities in special education. Nonetheless, Donovan and Cross (2002) cautioned against concentrating on specific demographic characteristics in fear that by evaluating only a few indicators, researchers may oversimplify and fail to account for the intricacies of a very multifaceted educational system.

Disproportionality in special education enrollment remains a social justice issue due to the confounding and sometimes negative impact of special education placements. Artiles et al. (2010) showed the academic outcomes between students with and without disabilities remains wide. Donovan and Cross (2002) acknowledged the purpose of special education is to *increase* educational opportunity by allocating additional and appropriate services for SWD. Despite decades of research, continued debate contributes to the collective understanding of the problem (Donovan & Cross, 2002). Scholars (Donovan & Cross, 2002; Ferri & Connor, 2005) have contended it is imperative to examine the how the eligibility leads to measurable differences in achievement to fully understand overrepresentation. Understanding the contributing factor of overrepresentation, school leaders can gain the tools needed to work towards eliminating the problem within public schools.

Regarding professional practices, some researchers evaluated policies such as assessment tools (Coffey & Obringer, 2000; Palmer et al., 1989; Nagliery & Rojahn, 2001) or committee decisions (Klinger & Harry, 2006; Wilkinson et al., 2006), while others examined demographic bias or influence within the assessment process (Cullinan & Kauffman, 2005; Harry et al., 2005; Kearns et al., 2005). By evaluating various components of practices and policies used to identify students who qualify for special education, researchers aim to untangle the complexity surrounding misidentification. Unlike using demographic features to determine the risk of eligibility, researchers studying professional practices evaluate the processes to determine if students are misidentified for special education.

Contributing Factors in Disproportionate Enrollment

Sociodemographic Factors

Donovan and Cross (2002) speculated historically marginalized students are at a higher risk of being overly represented in special education classes and underrepresented in gifted and talented classes. This finding was confirmed by Valenzuela et al. (2006) several years later, indicating a pervasive problem. Furthermore, looking at special education programming, researchers found distinct patterns between overrepresentation and demographic characteristics. Many scholars (e.g., Valenzuela et al., 2006; Skiba et al., 2006) found that even within special education programs, marginalized students were more likely to be placed in a more restrictive educational environment than their White peers.

Additionally, when looking at ethnicity, researchers found that two demographic groups have been predominantly overrepresented in special education programs - African American students (Valenzuela et al., 2006; Donovan & Cross, 2002; Skiba et al., 2006; Strand & Lindsay, 2009) and EL students (Artiles et al., 2004; Donovan & Cross, 2002; Hosp & Reschley, 2004; Klinger & Edwards, 2006). In fact, Hosp and Reschly (2004) found that concerning emotionally disturbed students, racial demographics, as compared to academic and economic indicators, were the strongest predictor of disproportionate representation. That is not to say other racial groups are not negatively affected, but these two groups continue to be at the forefront of the discussion of disproportionate enrollment.

Many scholars found an association between race profiles and enrollment into special education programs. African American students are more likely than their white peers to be in special education (Donovan & Cross, 2002; Hosp & Reschly, 2004; Skiba et al., 2006; Valenzuela et al., 2006). Not only are African American students overrepresented in special education, but they are also overrepresented in more restrictive classes within special education as compared to their disabled nonminority peers (Skiba et al., 2006; Valenzuela et al., 2006). Finally, researchers found a racial connection to the categories of marginalized students' disabilities. Specifically, African American students have been frequently disproportionately identified at ED (Hosp & Reschly, 2004; Skiba et al., 2006); Valenzuela et al., 2006). Hosp and Reschly (2004) found that racial demographics were the strongest indicator of special education LD identification for EL and Native American students. Additionally, they found that race was the strongest predictor for ED placement across all ethnicities. Ferri and Connor (2005) report that when considering language proficiency, Spanish-speaking students, compared to non-Spanish speaking students, are more likely to be disproportionally impacted.

The framework of overrepresentation has typically been presented as a problem with certain ethnic and racial groups afflicted by disproportionate enrollment (Artiles et al., 2005). However, even with limited articles focusing on the complex factions within the educational system, studies had discovered professional practices, intellectual testing, and personal bias hada direct influence on the overrepresentation of students, particularly historically marginalized students. It is evident from research that EL students are at risk for disproportionate enrollment in special education. I evaluated a Texas urban district to determine if their EL students were disproportionately represented in special education programming and their associated risk to be classified as both an EL student and classified as a student with special needs.

Economic Characteristics

In addition to racial demographics, poverty has been analyzed to determine if it is a viable predictor of special education placement (Donovan & Cross, 2002; Hosp & Reschly, 2004; Strand & Lindsay, 2009). Hosp and Reschly (2004) argued that minority students represented in special education were also considered as having a low socioeconomic status. Additionally, the racial and economic variables are beyond the control of school professionals; therefore, it is important to determine if they have a negative or positive relationship with disproportionate special education enrollment.

Poverty was identified as a predictor of special education placement and was the best indicator as compared to academic and racial demographic indicators (Coutinho et al., 2002; Hosp & Reschly, 2004). Out of the three previous demographics, poverty was the most significant indicator for the ID classification and if African-American students were identified as ED (Hosp & Reschly, 2004).

However, not all scholars found a positive correlation between poverty and special education placement. Using free lunch status as an ancillary for socioeconomic status, Skiba et al. (2005) found that this indicator was weak in predicting special education disproportionality enrollment. Supporting the findings of Hosp and Reschly (2004), Skiba et al. did find a connection between poverty and an intellectual disability (ID) eligibility. While many researchers tended to frame special education overrepresentation as a racial issue (Waitoller et al., 2010), several researchers examined the relationship between other student demographics and disproportionate enrollment, and the link between socioeconomic status and disproportionate enrollment. Although Hosp and Reschly (2004) found that racial demographics were the strongest indicator in general, poverty was the strongest indicator for ID placements. Skiba et al., (2005) disagreed and found that economic indicators, defined by students who received free lunch, was a weak predictor for special education placements. Zhang and Katsiyannis (2002) found, when comparing the northeastern region of the United States to the southern region, ELs were more likely to be overrepresented in the LD and ED programs in the North. Additionally, African American students were more likely to be identified as ED in the north-central regions of the United States. Beyond economic, racial, and regional indicators, Artiles, Aguirre-Munoz, and Abedi (1998) looked at national-level data and found that high levels of family structure affected the placement of Latino and African American students within the LD category of special education.

In conclusion, to eliminate disproportionate representation, Donovan and Cross (2002) suggested that school leaders must first understand the integrated relationship between risk factors and the eligibility process, which led to academic achievement differences within each homogeneous subgroup. Current eligibility procedures give insufficient attention to both institutional and cultural factors that lead to disproportionate enrollments (Klinger et al., 2006). The next section highlights the current research on EL students and possible contributing factors for misidentification or disproportionate representation in special education programs across the country.

Professional Practices

Intellectual testing

The American Psychiatric Association in the *Diagnostic and Statistical Manual of Mental Disorders* – 5th edition DSM-V-TR (2013), includes the cause and how to diagnose a specific learning disorder in either reading, mathematics, or writing. Instructions for diagnosing SLD include three indicators of an SLD. To meet Criterion A, students must show persistent difficulties in learning. Criterion B is poor performance achievement coupled with high effort. Clinical assessments must be "individually administered, psychometrically sound and culturally appropriate test of academic achievement that is norm-referenced or criterion-referenced" (p. 69) to meet the DSM-V criterion. Even so, since academic achievements vary, there is no actual measure to indicate if a student has learning disabilities (APA, 2013). The U.S. Department of Education provides states the authority to adopt their own criteria for specific learning disorders, as defined by IDEA policy section 34 CFR §300.8(c)(10). Lui et al. (2006) confirmed these measures varied in-between states, suggesting qualification for special education programming is somewhat arbitrary depending on who is assessing the student and the location of the student.

States must allow a model based on students' responses to scientifically-based interventions or use an alternative model based on research-based procedures (M. Musgraves, ED personal communication, January 21, 2011). Intelligence testing is one of the methodologies used to determine the discrepancy between achievement and IQ to diagnose a learning disability as outlined by the DSM-IV-TR (2000). This methodology became known as the discrepancy model. The idea behind the discrepancy model is that if the student is of average intelligence but is low performing, then the student must have a disability affecting their ability to learn or to perform at grade level.

While physical disabilities were easily diagnosed with an evaluation from a medical expert, mental health issues, including ID, LD, and behavior disorders, were harder to discriminate. Palmer et al. (1989) were at the forefront of criticizing the discrepancy or deficit model. They found that the tests, *Wechsler Intelligence Scale for Children–Revised* (WISC) and the *Kaufman Assessment Battery for Children* overestimated African American and Latino students' IQ scores. The tests indicated the students' IQ score was higher than their true IQ. This false IQ score resulted in students appearing to have a larger deficit between IQ and achievement,. Therefore, the tested sttudentshad an increased likelihood of qualifying for special educations services because the discrepancy was more than two standard deviations wide. Another research study found that African American students were more disproportionately labeled ID than their white peers when tested using the *WISC-III* test than the *Cognitive Assessment System* (Nagliery & Rojahn, 2001). Similarly, in Mississippi, Coffey and Obringer (2000) found that using a deficit model led to the over-identification of students from a diverse cultural and linguistic background. Maag and Katsiyannis (2008) agreed that the discrepancy model lacks integrity. These researchers suggested that there is a lack of validity associated with intellectual tests, particularly when evaluating the relationship between the assessments and student racial profiles.

Many questions revolved around the fidelity and validity of these assessments due to variability among school settings (Johnson et al., 2005) and the tests themselves (Bradley & Danielson, 2004; Klinger & Harry, 2006; Marston et al., 2003). School districts chose which assessments they administered for intellectual testing and were not regulated by the federal government (Maag & Katsiyannis, 2008). However, it was the President’s Commission on Excellence in Schools (ED, 2002) which found the tests to be unreliable, resulting in thousands of students being misdiagnosed each year, prompting a change in the federal assessment protocol, including the authorization to establish Response to Intervention (RTI) as an assessment procedure. Bradley and Danielson (2004) suggested that while IQ tests are ill-equipped to determine an LD status, they should be used to rule out if there is ID eligibility for the student.

The validity and integrity of intellectual testing, particularly in association with racial considerations, caused the federal and state governments to reexamine their special education eligibility procedures. While most states started incorporating other methodologies to determine emotional or learning disabilities, some states only use intellectual testing. According to Kavale (2005), the discrepancy model should be questioned because it is based on a wait-to-fail concept which tends to delay the identification of students who have learning disabilities, fails to identify some, and utilizes identification measures which are not linked to instructional practices. Finally, the discrepancy model does not provide information for the proper treatment of a mental health disability (Maag & Katsiyannis, 2008). Additionally, Marston et al. (2003) found that school psychologists were spending more time testing than providing consultations and interventions for students within the classroom. The authors suggested this time commitment and lack of classroom support increased the likelihood that struggling children would be referred to a special education program. In fact, Vaughn and Fuchs (2003) discovered that the number of students were found to have a learning disability has increased by over 200% since 1977.

Notwithstanding the importance of alternative eligibility models, researchers found that personal biases of professionals place a significant and often hidden condition of eligibility. In fact, Fielder et al. (2008) argued that it was not the method used to determine eligibility that mattered as much as the professional administering the tool. Meaning, regardless of data, personal bias often influenced the decision of a professional when considering special education eligibility (Cullinan & Kauffman, 2005; Harry et al., 2005; Kearns et al., 2005; Klinger & Harry, 2006; Knotek, 2003; Strand & Lindsay, 2009; Wilkinson et al., 2006). School professionals, including the psychologists evaluating the students for special education, may have conflicting perspectives regarding African American students and their families living in poverty (Harry et al., 2005; Kearns et al., 2005; Knotek, 2003). They may also fail to value the families' cultural capital (Harry et al., 2005), and associate overrepresentation of African American students with poverty (Kerns, Ford, & Linney, 2005). Knotek (2003) found that when students came from lower socioeconomic levels, their eligibility was determined by professionals who placed emphasis on their social profiles rather than on academic justifications. An opposing finding was reported by Cullinan and Kauffman (2005) did not find racial bias from school personnel towards African American students when determining ED eligibility. It is hard to prove or manifest a clear relationship between bias towards race and poverty and the overrepresentation of marginalized students. However, many authors argued that such an examination of racial and power struggles needs to continue (Artiles et al., 2010; Chamberlain, 2006; Valenzuela et al., 2006; Waitoller et al., 2010). Waitoller et al. (2010) suggested this is a relatively new research area but advised caution when developing the professional bias framework because it assumes professionals are rational beings which can make "independent and decontextualized decisions" (p. 43), when in fact, their actions are limited to their belief and educational systems.

Committee practices

Under federal regulations, the determination of special education eligibility is made by a committee composed of school professionals, the acting guardian of the student, and sometimes the student themselves. Scholars have also examined the professional practices of committee decisions. Although still sparse about other types of disproportionate research, Waitoller et al. (2010) identified several articles that primarily focused on the multidisciplinary committee profiles and the processes, which guide their eligibility decisions. Waitoller et al. (2010) suggested the committee practices and their eligibility decisions are an emerging research trend and an attempt to understand disproportionate enrollment in special education.

Wilkinson et al. (2006) reviewed LD placements and discovered only 5 of the 21 reports regarding EL reading disability and LD placement were appropriate placements. Of those, ten appeared to have learning issues not related to LD or lacked proper documentation, and six were LD, but not reading as the placement would indicate. Liu et al. (2008) also examined the committee decision of a large urban Texas school district and found that of nine EL students, five children were classified LD despite the presence of other factors that could explain reading struggles. For these five students, the authors raised questions regarding the assessment procedures, significant life incidents, and incomplete reference data. Furthermore, although all nine students technically met the criteria for LD, when considering background information for each child, the authors only agreed fully with one committee decision.

The native language of the students appears to have an impact on the committee members' decisions. Other studies have indicated that when evaluating EL students, school professionals found it difficult to distinguish between language proficiency from LD (Brown & Doolittle, 2008; Klinger & Edwards, 2006). Moreover, they found that bilingual assessors were misused, and there was an unequal distribution of authority among the members. Specifically, the school psychologists over-relied on test scores and had the most authority when it came to making eligibility decisions. Klinger et al. (2006) also found that school psychologists failed to provide testing materials in the students' native language making the results questionable.

For example, committee members often had a difficult time distinguishing between language acquisition and learning disabilities for EL students (Klinger et al., 2006; Klinger & Harry, 2006). According to Klinger, Artiles, and Méndez Barletta (2006), this is not uncommon among school psychologists. The authors found that those responsible for evaluating the students fail to give weight to or ignore the students' language when providing eligibility testing. To compound this issue, Klinger and Edwards (2006) found that the committee members interpreted the lack of language acquisition as low IQ or over-relied on the test scores. Additionally, bilingual assessors were not used correctly, and there were rarely pre-referral intervention strategies used with these students. That same year, Wilkinson et al. (2006) studied 21 EL LD reports in the area of reading disabilities and found the committee had made only five appropriate eligibility determinations. The others either were misidentified for reading-related issues when they qualified for LD for other issues, or the committee made eligibility decisions despite needing more information regarding the learning struggles of the students. Misidentification of non-native English speakers continues to be an area of concern regarding special education enrollment. A method to determine if students are at risk of being incorrectly classified as needing special education services, is to determine the rate and proportion of students of their demographic population within the total enrollment.

Culturally responsive teaching

A common critique of the educational system is the idea that all students first need an appropriate opportunity to learn and that this lack of opportunity may be leading to higher levels of special education referrals (Artiles & Koz, 2010; Donovan & Cross, 2002; Brown & Doolittle, 2008; Klinger & Edwards, 2006; Waitoller et al., 2010). Klinger and Edwards (2006) described a culturally responsive classroom as one that includes elements of accommodation, incorporation, and adaption. They described the accommodations as the skill needed by teachers first to understand the needs of their students and then tailor their instruction to meet those needs. For example, the authors point out that if teachers have EL students in their classrooms, they must have training in second-language instruction to provide a learning environment. Brown and Doolittle (2008) found that most teachers have not been trained or do not hold certifications to teach English as a second language. Incorporation is referred to as valuing and integrating the community into the curriculum. Finally, Klinger and Edwards (2006, p. 109) proposed that the students and the families must also adapt to the norms of the school. However, they point out that this practice is "additive rather than subtractive" for the students (Klinger and Edwards, 2006, p. 109). Klinger et al. (2006) contended sociocultural factors play a significant role in shaping a students' educational experience.

While the educational system integrates assorted variables that influence student achievement, Donovan and Cross (2002) suggested the quality of instruction and how a teacher can implement behavior management determines the extent that behavior and academic problems may arise. In contrast, several authors (Johnson et al., 2005; Kavale, 2005; Klinger & Harry, 2006; Marston et al., 2003; Mastropieri & Scruggs, 2005) theorize that special education enrollment is more about a myriad of indicators outside the classroom. Donovan and Cross (2002) disagreed and suggested that the disproportionate enrollment of students is tangled with a lack of opportunity to learn first within the classroom. After conducting a meta-analysis of disproportionate research, Waitoller et al. (2010) agreed with Kavale (2005) that the overrepresentation of students in special education is not easily defined and points out that an emerging research trend is to examine the classroom and school context first before demographic factors when attempting to understand the origins of overrepresentation. However emerging, the authors did articulate there is an absence of studies that link a lack of opportunity to learn to the disproportionate enrollment problem. Donovan and Cross (2002) argued that any solution for overrepresentation must be created at the micro and the macro levels to increase the educational opportunity of students. Concluding their report, Donovan and Cross propose that Response to Intervention (RTI) a solution, as it binds general education to special education and creates a prevention element within the classroom.

Learning disabilities can be difficult to establish without giving regard to a holistic examination of the student, including, but not an exhaustive list, classroom instruction, and cultural considerations, particularly when referring students from a diverse cultural and linguistic background (Klinger & Edwards, 2006). Ysseldyke et al. (1983) supported this idea and suggest that learning disabled children are similar to low academic achievers (D. Fuchs et al., 2004). However, Johnson et al. (2005) disagreed and speculated “that a student with a learning disability fundamentally differs from a student with low achievement, and that this key difference is likely reflected in disorders in psychological processes” (p. 571). Simarly, Kavale (2005) argued, particularly regarding classroom instruction, that if outside factors such as teacher influence were connected to learning disabilities, then entire classrooms or many students would be referred concurrently. Klinger and Harry (2006) wholly disagreed with this view and suggest that a teacher’s instruction must first be assumed inadequate when a student is struggling. In fact, these authors found that most teachers are never visited or observed before eligibility is determined. It is their conclusion that if a student has not had an adequate opportunity to learn, learning disabilities cannot be determined.

Overview of English Language Learner Disproportionate Representation

Although disproportionate enrollment rates of marginalized students have been discussed in publications for nearly three decades (Fielder et al., 2008), EL overrepresentation continues to be neglected in terms of research and evaluation (Valenzuela et al., 2006) despite an increased growth of the EL population within urban areas (Donovan & Cross, 2002). Across American, the EL population decreased from

10% in 2010 (National Center for Education Statistics [NCES], 2011) to 8.1 % in the fall of 2020 (NCES, 2020). However, 42 states had an increase in their EL enrollment percentages in the same time frame (NCES, 2020). Furthermore, Klinger et al. (2006) stated that poor tracking measures coalesced with states keeping incomplete data, and tracking EL enrollment using aggregated data at the state and national level is inadequate. Coupled with the growth in individual strength and arguments against large aggregate data sets, Sullivan and Bal (2013) argued studies should focus on smaller, local educational systems.

Wilkinson et al. (2006) suggested that poor performance, high student attrition, and dropout rates, coupled with disproportionate enrollment rates in special education, have forced attention on the EL population. It is clear from the research that EL students are at risk of being overrepresented in special education (Artiles et al., 2005; Donovan & Cross, 2002; Heller et al., 1982; Klinger & Edwards, 2006; Klinger et al., 2006; Linan-Thompson, 2010). For example, Artiles et al. (2005) found that EL students were 1.42 and 2.43 times more likely to be identified as Intellectually disabled (ID), have a specific learning disorder (SLD), or to have speech-language impairments (Speech) as compared to English-speaking students. Still, when looking at the EL population, overrepresentation is not homogeneous within the group.

Socio and School Demographics Associated with EL Disproportionate Enrollment

Students who were not proficient in either their native language or English were at the greatest risk of being identified as LD (Klinger et al., 2006). The risk associated with student language proficiency was found to be more significant at the elementary level and in the ID program at the secondary level (Artiles et al., 2005). Furthermore, Artiles et al. determined the more limited the students' English acquisition was, the more likely they were to be identified as ID when compared to other EL special education students. Additionally, EL students, in general, are more likely to be placed in more restrictive environments than other special education students (Donovan & Cross, 2002; Valenzuela et al., 2006; Waitoller et al., 2010). Artiles et al. (2010) argued students who were both lower socioeconomic and EL were more likely to be classified as LD than higher socioeconomic EL students. In fact, the higher socioeconomic EL students were more likely to be placed within a pullout speech program (SLI). Instructional practices have also been shown to be an indicator of special education enrollment. If EL students are receiving 100 % of their instruction in English, they were three times more likely to be classified as special education than EL students who are receiving some form of educational support in their native language. To better understand disproportionate enrollment in special education, these findings support the call for research within each type of special education diagnoses.

There was a distinct pattern of delayed enrollment of EL students in special education, indicating caution by school professionals to refer EL students (Artiles et al., 2005; Liu, Ortiz, Robertson & Kushner, 2008; Wilkinson et al., 2006). Artiles et al. (2005) reported that EL students, when compared to English-proficient peers, are more likely to be overrepresented in the secondary levels starting in 5th grade. There is an indication of delayed identification of academic disabilities within the EL population because teachers are unsure if their failure to meet academic standards is due to lack of language acquisition or special needs (Klinger et al., 2006; Klinger & Harry, 2006). Linan-Thompson (2010) identified several factors that have led to the overrepresentation of EL students. These are (a) a failure to ensure other factors are not influencing the students' academic struggle; (b) lack or limited intervention documentation, including the results of said interventions; (c) using interventions which were not data-driven or student-centered, and (d) favoring special education placement over classroom interventions. Considering tests are often given in English, several scholars (Klinger et al., 2006; Linan-Thompson, 2010; Liu et al., 2008) also proposed poor performance on the assessments could be attributed to a lack of English language rather than a lack of content knowledge or an indication of academic disability. To further the concern regarding assessment performance, EL students are prone to over-identification when only timed assessments are given to determine academic achievement (Linan-Thompson, 2010). These findings indicate the use of universal screening measurements, which are often a timed snapshot of the students' academic capabilities, do not accurately reflect EL student's academic achievement.

United States Educational Laws and Anti-Discriminatory Protections

The United States and each state have a constitution, create statutes, regulations, and are subject to case law (Wright & Wright, 2019). States must create their own statues and policies consistent with federal laws to receive federal funding support. Furthermore, school districts must determine policies and procedures that abide by both state and federal regulations.

Federal Regulations

Certain student subgroups have been historically denied equitable or even minimal access to education. With the passage of groundbreaking legislation and court decisions (i.e., Brown v. Board of Education, Elementary and Secondary Education Act, and Individuals with Disabilities Act, etc.), equitable access to educational systems gained substantial attention (Sullivan & Bal, 2013).

In 1970, one in five students with disabilities were enrolled in public education (Katsiyannis et al., 2001; OSERS, 2000). In 1974, Congress held a hearing and reported an estimated 1.75 children with disabilities did not receive access to public education (Katsiyannis et al., 2001). Congress adopted Public Law 94-142 (PL 94-142) in 1975. This law, now known as the *Individuals with Disabilities Education Act* (IDEA) following reauthorizations in 1997 and 2004, has four primary purposes of IDEA. The four primary purposes are (OSERS, 2000):

> *"to assure that all children with disabilities have available to them … a free appropriate public education which emphasizes special education and related services designed to meet their unique needs; to assure that the rights of children with disabilities and their parents … are protected; to assist States and localities to provide for the education of all children with disabilities, and to assess and assure the effectiveness of efforts to educate all children with disabilities."* (p. 5)

IDEA mandated students with disabilities should receive a fair and appropriate public education (FAPE). A federal law was needed after courts ruled it was discriminatory to not provide educational opportunities for students with disabiltiies

(Katsiyannis et al., 2011). Initially established as an amendment to the American Handicapped Act of 1970, PL 94-142 provided a bill of rights for students with disabilities and federal financial incentives and grants to schools. Students were able to attend school and join their non-disabled peers in the educational system. As evidenced by case law, inequity remained, resulting in more changes to federal education policy. IDEA was reauthorized in 1990 and again in 2004 to help provide further regulations against discriminatory practices. In the reauthorization of IDEA in 2004, the statute noted many minority children were being served at greater levels in special education program than their White peers, and greater efforts were needed to prevent misidentifying children as needing special education services (Section 1400 (c) (12)). A summary transformative academic and anti-discriminatory legislation is found in Table 3.

Artiles et al. (2010) warned the disproportionate issue would continue to remain for historically underserved populations if special education does not successfully close the gap between a student with and without disabilities. Accepting these findings, Waitoller et al. (2010) urged professionals and policymakers to be cognizant and sensitive to social and cultural considerations when developing educational policies. A

Litigation and Disproportionality

Disproportionate access to educational opportunities resulted in court cases that tried to acknowledge or manage the way students were qualified and were placed in special education programming. No other law has been more litigated than IDEA (Katsiyannis et al., 2001). Case laws have clarified educational policy and federal protections for students with disabilities and their due processes. Case laws beyond IDEA helped provide precedent and anti-discriminatory inclusion in the educational system. I provided a sample of historical and groundbreaking cases in Table 4.

Table 3

Federal Laws Regarding Discrimination in Education

Legislative Title	Summary
Elementary and Secondary Education Act (ESEA) of 1965	The United States federal government provided funding to the states to help assist schools in educating students who fell below the poverty line.
Education of the Handicapped Act	Expanding the federal grants provided by ESEA, this act provided funds to higher education programs for teacher training and technical assistance.
Section 504 of the Rehabilitation Act of 1973	Prohibits discrimination against individuals with disabilities using services provided by federal funds and requires students with disabilities to receive a comparable education to their peers with no disability. Commonly referred to as 504 and is monitored by the U.S. Office of Civil Rights.
Developmentally Disabled Assistance and Bill of Rights Act of 1974	Required states to provide protection and advocacy services and established rights for appropriate treatment and placement for individuals with disabilities
Education Handicapped Act – Amended in 1974	The amendment required states receiving federal funds to create a goal of providing full educational opportunities for students with disabilities.
Equal Educational Opportunities Act of 1974	This is an amendment of ESEA and provided clarity for schools regarding anti-discrimination policies, including for EL students and families.
All Handicapped Children Act of 1975	Commonly referred to as EHCA or P.L. 94-142. This law required states to create policies to ensure students with disabilities were provided free and appropriate education (FAPE) in their least restrictive class environment (LRE). The law is monitored by the U.S. Department of Education.
Individuals with Disabilities Act (IDEA) of 1990	Changed the name from EHCA to IDEA. The amendment provided additional categories of disabilities and required students over the age of 16 must have transition services included in their individual education plan.
Americans with Disabilities Act of 1990	Provides protection for anyone with disabilities in areas of employment, public accommodations, federal, state, and local services, and transportation.
Individuals with Disabilities Act (IDEA) of 1997	Amendments added discipline requirements, modified IEP requirements, strengthened parents' role and responsibilities, and emphasized students must make progress on meaningful educational goals.
Elementary and Secondary Education Act – Amended in 2001	Commonly known as Named No Child Left Behind (NCLB). It monitored how students learned and their performance levels. Schools and districts could be punished if they didn't meet specified criteria.

Legislative Title	Summary
Individuals with Disabilities Act – Amended in 2004	Amendment required states and schools to identify, report, and change discriminatory practices for minority students with disabilities. It also required progress monitoring of educational goals to ensure academic gains and that the goals be measurable and meaningful.
Every Student Succeeds Act of 2015	Commonly known as ESSA. It was renamed from No Child Left Behind. The purpose of the act is to close academic achievement gaps and ensure all children receive a fair, equitable, and high-quality education.

Table 4

Federal and District Case Law Regarding Discrimination in Educational Settings

Case Name	Date	Ruling
Brown v. Board of Education	1954	The courts ruled schools must be racially desegregated and no longer 'separate but equal".
Larry P. v. Riles	1972	IQ tests were not validated for use with students of color, thus invalidating their use for determining special education qualification. Future evaluation processes in California needed to include multiple sources of information and not just one standardize assessment.
Pennsylvania Association for Retarded Citizens (PARC) v. Commonwealth of Pennsylvania	1971	Students with intellectual disabilities could benefit from curriculum and training. The public schools must offer free and appropriate public education. If the child does attend a special school, they must be evaluated every two years.
Mills v. Board of Education	1972	Schools were required to provide public education to students with disabilities, even if the students were unable to pay for the services. The ruling established that all children were entitled to free public education appropriate to their learning.
Diana v. California State Board of Education	1973	Using IQ testing as the sole determination of special education violated the Equal Protection Clause. Schools in California must use additional sources of information to decide special education qualifications. This case was based on an English language learner.
Lau v. Nichols	1974	The Court found that the schools had violated section §600 of the Civil Rights Act of 1964, which state schools receiving federal funding must not discriminate based on race, color, or national origin. It established the precedent that 'identical education' does not constitute 'equal education.' Schools must teach English to English language learners.
Georgia NAACP v. State of Georgia, et al.	1985	The courts held that ability grouping was allowable only if the district could prove the segregation of the special education students' remedies provided better educational opportunities for the students. Rather, the students were not grouped due to race, but skill acquisition.
Casteñeda v. Pickard	1981	The ruling created a 3-prong test to determine if an EL student was denied equal educational opportunities. The curriculum used with ELs must be recognizable by experts, methods have been proven to be effective, and students were successful against language obstacles.
Plyer v. Doe	1982	Immigrants could not be denied access to public education, including undocumented children. Immigrants were also held responsible for compensatory attendance according to state laws.
United States v. State of Texas	1982	The courts found that Texas failed to provide instruction to ELs, as mandated by EEOA. The state had to adopt bilingual education services to students.

Case Name Continued	Date	Ruling
S.H. v. Lower Merion School District	2013	The 3rd Circuit Appeals Court found unless there were "intentional discrimination" schools could not be liable for misdiagnosing a student. The decision wording left the future open over misdiagnosed cases.
Issa v. Lancaster School District	2017	Non-English speaking refugees were misplaced in an educational setting for at-risk students. Using the EEOA, courts determined the school must provide a program specifically designed to teach English language skills.

Federal and State Monitoring

Waitoller et al. (2010) conducted a meta-analysis of disproportionate research and found that many articles have been published since 1968, with more than half between 2000 and 2006, and with a third of the total between 2004 and 2006. Logically, this is related to the emphasis of the reauthorizations of IDEA in 1997 and 2004, where states were to provide consideration to the needs and identification of students with learning disabilities. Within that time frame, states were charged with decreasing racial disproportionality, paying greater attention to ethnic, racial, cultural, and linguistic demographics of the students (Posney, 2007; Waitoller et al., 2010). For the 2004 amendment, Congress made identifying and monitoring disproportionate enrollment in special education programming a top priority for schools (Albrecht et al., 2012; Posney, 2007).

Waitoller et al. (2010) argued disproportionality in special education was primarily framed in three ways: a socio-historical examination of power structures and race relations, an analysis of professional practices of authority figures, and examinations into contextual and demographic explanations. An overwhelming majority of the articles investigated the professional practices of the schools, administrators, teachers, and the socio-demographic characteristics of the students (Waitoller et al., 2010). Investigations on who and how minority children were disproportionately placed in special education aligns with the amendments of IDEA of 2004.

The 2004 IDEA amendments required the Department of Education to monitor and assist the state education agencies (SEAs), and the SEAs were required to monitor and assist the local educational agencies (LEAs) (Posney, 2007). For example, in *Texas Education Agency v. U.S. Department of Education* (908 F.3d 127), the Department of Education withheld $33 million from TEA because the state failed to provide financial support for children with disabilities, under Maintenance of State Financial Support (MSF), as required by IDEA (Wright & Wright, 2019). TEA used a weighted model to fund special education and did not meet the IDEA MSF requirement to provide at least the same amount of special education funding as the previous year. The court case was part of a larger failure by TEA to support school districts in providing fair special education services to students in need of services (De Matthews & Knight, 2019).

Even before the amendments of IDEA in 1997, the U.S. Ninth Circuit upheld that SEAs were required to enforce local school districts to uphold federal regulations (*Idaho Migrant Council v. Board of Education,* 1981). Per 20 U.S.C. 1418(d) and 34 CFR §§300.646, federal regulation required states to identify disproportionality issues and provide interventions to correct the disproportionate enrollment. Despite federal regulations requiring SEAs to monitor and enforce federal laws, IDEA (2004) allows SEAs discretion to define disproportionality within their state, making interstate comparisons difficult if relying on state-reported data. Although the federal government requires states to report their special education disproportionality data, the law does not define how to determine disproportionality, which causes greater state-to-state variability.

Methods for Calculating Disproportionality

Disproportionality generally refers to enrollment differences for a student subgroup that is above (or below) the level we would expect given the proportion of students enrolled in the general population (Chinn & Hughes, 1987; Fielder et al., 2008; Skrla et al., 2004). Currently, there is no federal definition for disproportionality, leaving states to create their own and providing for variance across the country. This variance makes comparison difficult unless it is done using a widely accepted definition, such as the one developed by Chinn and Hughes (1987): A student group is considered overrepresented if its program enrollment proportion is equivalent or greater than 10% of the proportion enrollment of the general school population for that group. For example, if EL students make up 20% of the total school population, an overrepresentation of this population would be anything equal to or over two percentage points enrolled in special education (≥ 22%). Essentially, overrepresentation occurs if there is a greater rate of students enrolled or represented in a program than in the total enrollment (Chinn & Hughes, 1987; Fielder et al., 2008; Skrla et al., 2004).

Since disproportionality research became a topic of interest, most of the published academic studies predominately use quantitative methods (Waitoller et al., 2010), such as risk indices to examine the overrepresentation of the African American student population within special education (Artiles et al., 2005; Waitoller et al., 2010). Waitoller et al. (2010) presume the tendencies to employ quantitative analytic skills are an attempt by the researchers to find a relationship between racial inputs and disproportionate enrollment outcomes.

To further complicate the understanding of the issue, Artiles et al. (2005) suggest that research has discovered differences in disproportionality trends between the federal, state, and school-level systems. For example, in Texas, where the study is located, the TEA employs a risk index of 7.34[4].

In addition to calculating risk ratios associated with ELs enrolled in the district special education program, multilevel modeling was used to examine the relationship special education classification of non-native English speakers and their student and school factors. Composition index, risk index, and risk ratio is a common quantitative method for examining proportional differences between different school groups (Gibb & Skiba, 2008). I used the three indices plus multilevel regression to answer the study's research questions.

Conclusion

Currently, within the United States, all children must have access to and receive educational opportunities. Historically, certain student subgroups have been denied equitable or even minimal access to education. In 1970, one in five students with disabilities were enrolled in public education (OSERS, 2010.). Despite ongoing efforts

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[4] TEA (2015) uses the following calculation for their risk difference:

$$\left[\left(\frac{\substack{\text{Number of students within a specific}\\ \text{disability category and of a specific}\\ \text{race and ethnicity}}}{\substack{\text{Total number of students in a}\\ \text{district of a specific race or ethnicity}}}\right) \text{X } 100\right] - \left[\left(\frac{\substack{\text{Number of students within a specific}\\ \text{disability category for all other}\\ \text{race and ethnicities}}}{\substack{\text{Total number of students in a}\\ \text{district for all other race and}\\ \text{ethnicities}}}\right) \text{X } 100\right]$$

to ensure equal educational opportunities, equality has not been fully realized, as evidenced by ongoing lawsuits arguing for more equitable practices.

Disproportionate issues have been studied and published. However, the research often examines contexts of race (Waitoller et al., 2010) and is aggregated on large scales such as state or national data (Sullivan, 2011; Sullivan & Bal, 2013). I hoped to build on previous disproportionate and EL research to provide a more thorough understanding of the issue at a district level, within an area with high levels of English language learners. Additionally, I generated a comparison to results already published for the district on the overrepresentation of EL students in special education.

CHAPTER III

METHODS

I used quantitative analyses to investigate the representation of EL students, as compared to their White and native English-speaking peers, over a five-year period. The disparate theory was identified as the most relevant theoretical lens to evaluate the research problem. I build on existing literature by examining the representation of EL students compared to their white peers, but also their native English-speaking peers (of any ethnicity). Further, I examined representation by program placement and by student and school demographics, an important step in providing context to the complex issue (Bollmer et al., 2007). Finally, through the study, I built an understanding of the factors potentially related to special education representation. I examined the relationship between observed patterns of classifications and predictors, as discussed in the literature review. I contributed to the previous research literature by including the students' immigrant status and the number of years the student has been participating in the United States educational system, as reported by the district.

The analysis was conducted in two phases. The first analysis included three commonly used disproportionality measures: composition index, risk index, and risk ratios (Gibb & Skiba, 2008). The composite index, risk index, and risk ratios were used to examine the proportionate relationship of EL students to special education enrollment. Since the district has been previously evaluated using risk ratios, this type of analysis offered an opportunity to measure long-term special education enrollment changes beyond the years included in the study.

In the second analysis, I used a multivariate, multilevel model to examine the relationship between the district's special education enrollment by student or school predictors. The dataset included many independent variables and the multiple regression analyses allowed the findings to be controlled by multiple factors, such as student and school demographics factors (Vogt et al., 2014). Through the binary and multinomial logit modeling, I was able to further previous socio-demographic research on predicting the risk of special education identification and enrollment.

Research Questions

I analyzed the enrollment of ELs in special education in a large, diverse urban school system in Texas. I sought to answer the following research questions:

1. Is the EL special education enrollment disproportionate when compared to their White, English speaking, or minority, English-speaking peers?

2. What is the probability of a student being identified as special education as a function of their EL classification, controlling for the student and school characteristics?

3. What is the likelihood of an EL student being classified with a high incidence category of special education including specific learning disabled (SLD), emotional or behavior disorder (ED), and intellectually disabled (ID), controlling for the student and school characteristics?

Data Collection

Data were gathered from a large, urban public school district in Texas, which has agreed to participate in the study. I was given the data using an encrypted USB drive. The data was collected from the following years: 2013–2014, 2014–2015, 2015–2016, 2016–2017, and 2017–2018, providing five years of data. Longitudinal data analysis was used to examine the district trends and assess stability within the district enrollment (Bollmer et al., 2007). The data included school and student demographics, with student identification hidden for confidentiality.

The data included all students from all schools within the district. During the five years, the district added and closed schools. The number of schools varied from any given year. Any school that had five or fewer students classified as EL enrolled in special education, or a combination of both, was dropped to protect student privacy (Sullivan, 2011). Student information requested from the school district is listed in Table 5.

Academic performance was not included in the study due to concerns regarding endogeneity (Sullivan & Ball, 2013). The study attempted to identify predictors of special education qualification only through student and school demographics, not student performance. Academic performance could be a result of the classification, not necessarily a preceding factor. Given the study attempted to identify predictors of special education qualification with relation to a student's LEP status, several students and school-level variables are included for research questions two and three, as displayed in Table 5.

The district is split into smaller areas, mostly based on geographic lines. One area is dedicated to serving campuses have a history of poor academic performance and students are considered highly at-risk. I used the 2017-2018 area boundaries for all five years. Not all students in the data set were coded to the most recent boundry areas. To capture these students, I created a separate district area. This area also includes students who are receiving services out of the disrict, but for monitoring purposes, remain enrolled as a student.

Table 5

Campus and Student Data Variables for Study

Variables	Level of Measurement	Measurement Type	Independent or Dependent Variable	Research Question #1	Research Question #2	Research Question #3
Primary Disability	Student	Nominal	Dependent	*	*	*
SpEd Status	Student	Dichotomous	Dependent	*	*	*
District Area	Campus	Categorical	Independent	*	*	*
Eco Disadv.	Campus	Dichotomous	Independent		*	*
LEP (EL) Status	Campus	Continuous	Independent		*	*
% SpEd Enrollment	Campus	Continuous	Independent		*	
School Level	Campus	Categorical	Independent	*	*	*
Teacher Racial Distribution	Campus	Continuous	Independent		*	*
# of Years in U.S. Public Education	Student	Continuous	Independent		*	*
Federal Race	Student	Categorical	Independent	*	*	*
Gender	Student	Dichotomous	Independent	*	*	*
Grade	Student	Ordinal	Independent		*	*
Home Language	Student	Categorical	Independent		*	*
Immigration Status	Student	Dichotomous	Independent		*	*
LEP Status	Student	Dichotomous	Independent	*	*	*
Migrant Status	Student	Dichotomous	Independent		*	*
School Attendance %	Student	Continuous	Independent		*	*

When using multivariate regression, missing data will cause the observation to be excluded. To address this, I replaced missing data in categorial variables as Not Available or Other, depending on the labeling of the variable. For continuous variables, such as % of enrolled students in special education for the previous year, I replaced the missing variables with a zero. The reason for missing variables in the previous special education enrollment average is due to new schools opening with no previous data. These changes allowed all students observations to be included in the data analysis.

Data Analysis

The following section is organized by outlining the methods used to answer each research question. Two software programs were used to answer the questions. Each research question has a unique research approach and was addressed independently. For the second research question, the dependent variable (DV) is the special education indicator. It is a binary variable given the student only has two outcomes (Maddala et al., 2008). The two outcomes indicate whether the student is either classified as special education or is not classified as special education. For the third research question, the dependent variable is categorical variable created to represent the type of special education disability the students were diagnosed with; specific learning disabled (SLD), emotional or behavior disorder (ED), or intellectually disabled (ID). The student-level indicators used for the study include student social and demographic factors and school factors. The next few sections describe the general statistical approaches used in the study. The analysis was conducted using Excel and STATA 16.1.

Analyses by Research Question

Research Question 1. Is the EL special education enrollment disproportionate when compared to the total enrollment proportion of EL students in the district?

Within the field of disproportionality in education, composition index, risk index, and risk ratios are commonly used as measures of disproportionate enrollment (Bollmer et al., 2007; Gibb & Skiba, 2008; Skiba et al., 2006). The measures also serve as a model to estimate their risk of being placed in either group, which allows for an estimation of disproportionate enrollment (Gibb & Skiba, 2008, Skiba et al., 2006; Sullivan, 2011; Sullivan & Bal, 2013). Specifically, the risk ratio, or odds ratio, is the odds that the student is associated with one group relative to another group (Powers & Xie, 2008).

First, this research question was investigated using the composite index. The composite index produced an enrollment proportion for students classified as both EL and special education. Using the Chinn and Hughes (1987) definition of disproportionality, this research question seeks to identify enrollment disproportionality over 0.1 of the general population enrollments. Although TEA has its formula to determine disproportionality, by using Chinn and Hughes (1987), the research can be utilized for comparable work in the future. Next, this research question looked at the odds an EL student is classified as disabled compared to their white peers, then again to their EL peers who were not disabled.

Further, I examined the impact of independent student demographics on the risk ratios, such as language proficiency, socioeconomic status, the student home language, and immigration/migrant status. Additionally, I also examine the risk ratios associated with the enrollment of EL students at various grade levels (elementary, middle, and high school), and special education classification when compared to either their White or native English-speaking peers. The risk ratios helped describe if EL students were more at risk of being enrolled in special education than either their White or native English-speaking peers.

I present the following steps to detail risk ratio calculations. These equations allow for the breakdown of the odds ratio into composite and risk indices. The indices are used to determine the risk ratio of a student being classified as special education, based on their membership in various independent subgroups or demographics (Gibb & Skiba, 2008).

Composite index. The composite index is the first measure schools often use to estimate disproportionate enrollment (Bollmer et al., 2007; Gibb & Skiba, 2008). Specifically, this measure addresses the question: Are there more students from a subpopulation in special education than we would expect given their general education enrollment?

Once a school determines the composite index (using the formula below) of a group’s membership in special education as compared to their membership in general education, a threshold is applied to determine whether this proportion is then expected. The most widely used threshold was developed by Chinn and Hughes (1987), who applied a confidence interval of 10% on the general education membership.

$$Composition\ Index = \left(\frac{Number\ of\ students\ from\ a\ sub - group\ in\ a\ disability}{Number\ of\ students\ in\ disabilty}\right) * (100)$$

The composite index does have several limitations (Gibb & Skiba, 2008). First, this index is not appropriate for student groups that are highly represented in a group. Gibb and Skiba (2008) state that as the student group proportion represents 90% of the total enrollment, the composite index becomes a less reliable measure. Second, the composite index does not allow for proportion comparisons across student groups. As a result of the composite index limitations, the measure should be used in tandem with risk indices and risk ratios (Gibb & Skiba, 2008).

Risk index. The risk index is a measure used to calculate the percentage of a student group being served in special education. The student group enrollment in special education is divided by the total number of students in that group using the formula below:

$$Risk\ Index = \left(\frac{Number\ of\ students\ from\ a\ sub{-}group\ in\ a\ disability\ category}{Number\ of\ \text{enrolled}\ students\ in\ the\ sub{-}group}\right) * (100).$$

This measure calculates the risk of special education enrollment within the context of a given student group (i.e., race and language classification). Risk indices are also measuring of effect sizes (Sullivan & Bal, 2013). However, used by itself, the risk ratio is not particularly informative (Gibb & Skiba, 2008). Therefore, each risk index is compared to each other to create the measure risk ratio.

Risk ratio. Risk ratios address the question: how much more or less is a student group likely to be classified as a student with a disability as compared to other students being served in special education? A student group risk index is divided by the total risk index of the comparison group in special education.

$$Risk\ Ratio = \left(\frac{Risk\ for\ sub - group\ for\ disabilty\ category}{Risk\ for\ comparison\ group\ for\ disability\ category}\right) * (100)$$

If the risk ratio = 1, the two groups face the same risk. Ratios over 1.0 indicate the student group is at a higher risk of placement, and ratios under 1.0 indicate the student group is at a lower risk of placement (Bollmer et al., 2007; Powers & Xie, 2008). The literature accepts risk ratios over 1.5 to indicate disproportionate enrollment in special education (Gibb & Skiba, 2008). However, since the federal government did not dictate a disproportionate standard, states can define their threshold. Gibbs and Skiba (2008) report many states use a risk ratio threshold of up to 2.0-2.5 times the comparative group, whereas TEA (2015) has set a threshold of 7.34.

Risk ratios have several limitations. For one, the ratio is highly dependent on the comparison group (denominator). Therefore, variability within the comparison group can have a substantial impact on the risk ratio and makes district comparisons challenging, given the variability between districts. Secondly, risk ratios are highly skewed by small enrollment numbers and cannot be used if there is no special education enrollment or services within the comparison group (Bollmer et al., 2007).

Per OSEP (2017) and TEA (2015) guidelines, if groups examined had less than ten students (composite index numerator), the group should not be examined. This guideline also applies if the total group enrollment is less than thirty students (composite index denominator). Given I examined multiple years and disaggregated the results by student or school characteristics, if the target group or the comparison group had too low of numbers to calculate, I did not calculate both the composite and risk indices or the risk ratios.

Research Question 2. What is the probability of a student being identified as special education as a function of their EL classification, controlling for the student and school characteristics?

According to TEA (2011) data, EL students are underrepresented after aggregating statewide data. This underrepresentation of special education students in Texas has been highlighted in a recent investigative report by Brian Rosenthal (2016c). In 2011, the district being studied enrolled fewer proportions of EL students in special education as expected, given their overall enrollment rate (H.T. et al., 2011). Sullivan (2011) confirmed districts might have underrepresentation and overrepresentation of ELs in special education within one state. The second research question was focused on district-level data and provided risk indices for varying school levels (i.e., elementary, middle, and high school) and student factors (i.e., immigrant status and native language).

Binary Regression Model. The DV is binary and categorical (i.e., enrolled in special education, not enrolled in special education). Logit and probit models are recommended when the DV is categorical, and the IVs are either categorical, continuous, or mixed (Agresti, 2013; Vogt et al., 2014). I used an ordered logistical regression model because it estimates how the probability of being enrolled in special education as impacted by the student and school level explanatory variables (Long & Freese, 2006; Vogt et al., 2014).

I investigated the impact of student demographics or school factors on the probability of special education classification, including the students' language classification and immigration status. By using a logit model, I controlled for those demographics, or the independent variables (Vogt et al., 2014). Additionally, all variables were standardized to the grand mean to allow for comparison (Sullivan & Bal, 2013; Vogt et al., 2014).

Mathematical structure. Logit and probit models differ in how they treat the error distributions (Long & Freese, 2006). Logit models are used in the study as they easily work with the odds ratio model discussed below. The model for logistic regression can be written as

$$\pi(x) = \frac{\exp(\alpha + \beta x)}{1 + \exp(\alpha + \beta x)}.$$

With a categorical and binary dependent variable *Y*, and an independent or explanatory variable *X*, $\pi(x)$ = P(Y=1|*X*=x) = 1- P(Y = 0|*X* = x). Agresti (2013) explains, "as *x* increases, $\pi(x)$ increases when $\beta > 0$ and decreases when $\beta < 0$" (p. 119). The logit (log odds) model can be written as

$$\text{logit}[\pi(x)] = \log \frac{\pi(x)}{1-\pi(x)} = \alpha + \beta.$$

In the logit model, the odds ratio multiplies e^{β} for every 1 unit increase in *x* (Agresti, 2013). The odds ratio is discussed further in the next section.

Interpretation. Although a variety of inference tests are available for logistic regression (Agresti, 2013), I used the likelihood-ratio to determine statistical significance. Agresti (2013) explains that the log likelihood ratio "…uses twice the difference between the maximized log likelihood at $\hat{\beta}$ and at β = 0 and also has an asymptotic χ_1^2 null distribution" (p. 169). As previously mentioned, the variables chosen for the regression were based on previous research, but also include the number of years the student has been in the United States public school system and their immigration status. Additionally, the analysis will employ a chi-squared test with the logit model, the test statistic should be small, and the *p*-value should be large (Vogt et al., 2014; Powers & Xie, 2008).

Goodness of fit. To determine a goodness of fit for the regression model, I compared the log likelihood to the log likelihood of a more complex model to test if the $H_0 = 0$. Testing for the goodness of fit is a major step because there is "…no guarantee the logistic regression model fits the data well" (Agresti, 2013, p. 171). The log likelihood ratio chi-square statistic (LRχ^2) is

$$\mathbf{LR}\boldsymbol{\chi}\mathbf{2} = -2(\mathrm{L}_0 - \mathrm{L}_{\text{final}})$$

When the LRχ is high, the logit coefficients are not all equal to zero. If a coefficient has a value of greater than zero, it shows that the explanatory variable has an impact on the dependent variable.

When building the models, to determine if the new model brings significant improvement, LRχ^2 will again be used. With each new model, a new calculation of degrees of freedom must be completed. The equation is written as

$$\boldsymbol{\chi}\mathbf{2} = -2(\mathrm{L}_{M1} - \mathrm{L}_{\mathrm{M2}})$$

where L_{M1} is the log likelihood ratio from the first model and L_{M2} is the log likelihood ratio from the revised model. The $\boldsymbol{\chi}\mathbf{2}$ was found with the difference in the degrees of freedom between the two models when using a chi-square critical values table. If the value on the table indicates significance, the explanatory variables in the revised models have added significance.

An additional test for goodness of fit is to compare the McFadden's Pseudo R^2 in the different models. The larger the Pseudo R^2, the better model fit.

Odds ratio. Risk ratio is another term for odds ratio (Maddala, 1990) and can also be measured using a logit regression model (Powers & Xie, 2008). The odds ratio formula is written as:

$$\theta = \frac{\omega_1}{\omega_2} = \frac{p_1/(1-p_1)}{p_2/(1-p_2)}$$

where $\omega_1 = p_1/(1-p_1)$ is the odds that a member of the sub-group was enrolled in special education and $\omega_2 = p_2/(1-p_2)$ is the odds that a member of the comparison group was enrolled in special education. If the two groups have the same odds of being classified as special education, the risk-ratio is 1. If the odds ratio (e^{β}) is higher than 1, the identified sub-group is more at risk than the comparison group to be classified as special education. If the odds ratio (e^{β}) is lower than 1, the identified sub-group is less at risk to be identified as special education. That is, the odds of an EL student being identified as special education in relation to a comparison group, such as a White or native English speaking peer. A *p*-value = 0.05 was used to indicate statistical significance.

The logit regression model can be written as

$$\boldsymbol{\rho_i} = \Phi\left(\sum_{\boldsymbol{k=0}}^{\boldsymbol{K}} \boldsymbol{\beta_k}\ \boldsymbol{\chi_{ik}}\right)$$

where $\boldsymbol{\rho_i}$ is the probability a student was classified as special education controlling for independent variables, and ϕ denotes a standard normal distribution (Powers & Xie, 2008). The odds ratios were identified through the logit regressions under the $\boldsymbol{e^{\beta}}$. This analysis estimated the probability of a student being classified as special education (dependent variable) with several independent variables (see Appendix A for a full list of variables). In other words, what is the probability the student was classified as special education given a unit change in a predictor variable (IV) when holding all other predictor variables (IVs) constant? All probabilities in logistic regressions are tested against the theory that all predictor coefficients will be zero.

Research Question 3. What is the probability of a student being classified with a high incidence category of special education including specific learning disabled (SLD), emotional or behavior disorder (ED), and intellectually disabled (ID), controlling for the student and school characteristics?

Increasingly, research has been focused not only on the disproportionate special education enrollment but also the classification and what setting minority students are placed in (Skiba et al., 2006). IDEA (2004) requires students to be served in the least restrictive environment (LRE) possible (612(a)(5)(A)). The special education classification (i.e., LD, ED, and SLI) and time spent in the general education classroom are factors associated with determining the LRE for a student. For this reason, I analyzed factors related to high incidence classifications and the amount of time spent outside of the general education classroom.

Although rates of inclusive education are on the rise for students with disabilities, studies have shown that minority students continue to be at risk for more restrictive environments, placing these students at a further disadvantage for social and educational access (Skiba et al., 2006).

The DV being studied is the type of special education classification the school assigns a student (see Appendix A for the list of classifications being used in the study). Multivariate regressions are often used because there are multiple influences on an outcome (Vogt et al., 2014). Using a multinomial logit model and odds ratios, multiple student and school characteristics were used to estimate which special education classification an EL student may receive.

Multinomial Logit Analysis. In the third portion of this study, I estimated the probability for each high incidence category a special education student can be classified as, given a set of independent variables. To conduct these analyses, a multinomial logit model was used to estimate the probabilities of being classified for each high incidence category. Multinomial logit models are used to estimate the effect of independent variables when there are multiple possible outcomes within the dependent variable (Agresti, 2013). In this study, the multinomial logit model will estimate the effect of a 1-unit change of the predictor variable (IV) on the type of high-incidence special education classification category (DV) (Powers & Xie, 2008).

Mathematical structure. The baseline multinomial logit model can be written as

$$\log \frac{\pi_j\ (x)}{\pi_J(x)} = \alpha_j + \beta_j^T x, \qquad j = 1, \dots, J = 1$$

where the outcome (Y) of being identified as special education has several categories (j), $\alpha_J = 0$, and $\beta_J = 0$ (Agresti, 2013). In the model, $\pi_j (x) = P(Y = j|x)$ is at a fixed setting of x for the predictor variables, with $\sum_j \pi_j (x)$ (Agresti, 2013). The model treats the high incidence special education categories as a multinomial variate with probabilities $\{\pi_1(x), \ldots, \pi_J(x)\}$ (Agresti, 2013). In multinomial analyses, each possible DV outcome is compared to a baseline category, often the most common one (Agresti, 2013; Powers & Xie, 2008). A descriptive analysis determined the highest disability category for the district, and that category was used as the baseline for comparisons.

Interpretation. The interpretation is like the logistical regression discussed earlier. Two parts of the statistical output were used to determine if the model is significant – the chi-square (X2) and the log likelihood ratio. However, the number of parameters being estimated differs from a binary logit model. In a multinomial logit model, the number of parameters being estimated is

$$K(J - 1)$$

where K is the number of independent variables, and J is the number of categories in the dependent variable. That is, each of the categories beyond the base category had coefficients for each independent variable.

Goodness of fit. Multilevel models were used to account for within and between school effects (Sullivan & Bal, 2013). I included several student and school characteristics hoping effects appeared or disappeared when controlling for other variables (Vogt et al., 2014). Controlling for multiple variables became critical because the cohort did not include random assignment, such as the district data used within the study (Vogt et al., 2014).

The goodness of fit analysis is the same as the logit regression model above. The log likelihood ratio chi-square statistic ($LR\chi^2$) is

$$\mathbf{LR\chi 2} = -2(\mathrm{L_0} - \mathrm{L_{final}})$$

However, rather than using the difference in degrees of freedom, the number of parameters in the model is used. If the $LR\chi^2$ is large enough, it is accepted that at least one of the coefficients is greater than zero.

Odds ratio. Additionally, the model describes the effects of the predictor variables (*x*) on the odds of being placed in a special education category (J – 1 logits) through the equation

$$\pi_j(x) = \frac{\exp(\alpha + \beta_j^T x)}{1 + \sum_{h=1}^{J-1} \exp(\alpha_h + \beta_h^T x)}$$

(Agresti, 2013). The odds ratio is used to estimate the probabilities of an EL student being placed in a high-incidence special education category, given their student and school-level factors. If the odds ratio for a given explanatory variable is greater than 1, then the student is more likely to be identified as special education in that given category than the comparison category based on the independent variable. Conversely, if the odds ratio for an explanatory variable is smaller than 1, the student is less likely to be identified as special education within that category as compared to the base category based on the independent variable.

Study Limitations

Factors that prevent generalization to a population are considered study limitations (Lunenburg & Irby, 2008). Since the study is examining a local context, the findings are limited to the local landscape only and cannot be generalized to the state or national education systems. Moreover, the use of a correlational coefficient to indicate a relationship does not imply causality (Luneburg & Irby, 2008). I did not intend to identify casual relationships but rather to describe relationships identified through a regional framework.

Further, without a federal definition of disproportionately, states are required to create their own standard. As such, the calculations used to report disproportionately also vary among the states (Klinger & Edwards, 2006). The disproportionality standard (Chinn & Hughes, 1987; Sklra et al., 2004) and measurements (Skiba et al., 2006; Sullivan, 2011; Sullivan & Bal, 2013) applied to this study come from scholarly research, rather than the TEA. Therefore, the results may differ from any state inquiry. However, using the scholarly definition for disproportionately (Chinn & Hughes, 1987; Skrla et al., 2004), the results from this study may have a greater opportunity to be compared to other scholarly projects.

Despite the study limitations, the findings indicate insight into a research field that has a limited number of studies exploring the disproportionate enrollment of EL students in special education. Further, the findings helped illuminate the issue at one of the largest school districts in Texas, considering Texas is a state with one of the largest EL populations in the country.

CHAPTER IV

RESULTS

The purpose of the study was to explore student, and school characteristics associated with EL students enrolled in special education programs in a Texas public school district. (Sullivan, 2011; Sullivan & Bal, 2013; Artiles and Bal, 2015). Disproportionate special education enrollment, based on student and school characteristics, remains a complex and nuanced issue. The issue becomes more complicated as enrollment patterns are drilled down from federal to state and local areas (Bollmer et al., 2007). This study analyzed a district EL pattern to determine if there was evidence of disproportional special education enrollment issues and attempted to predict the probability of an EL student being identified as needing special education services. Examination of the microenvironments is important to disaggregate school outcomes to identify potentially misidentified students or inequitable processes. The school outcomes will determine if the students are victim to a disparate impact by the qualifying process.

I compared the relationship between students classified as EL and qualified for special education services to their native English-speaking peers. The purpose of the study was met through several quantitative statistical methods, including (a) calculating risk indices, (b) logit, and (c) probit regressions. The five-year time span allowed an examination of the findings throughout the state and district policy changes. I dropped any observations from the campus level if there were less than five students identified as either EL or special education. Student records that had missing or incomplete information were kept the analysis, and I applied the missing data process as discussed in the methodology section. The research questions in this chapter discuss the results of the study.

For the first research question, I analyzed enrollment data to determine the proportionality of EL enrollment and calculate the risk ratios associated with special education. For the second research question, I used probit regression to examine the probability EL students in this district will be placed in special education, controlling for student and school characteristics. I also examined the probability of EL students being placed in high incidence categories of special education for the final research question.

Research Questions Results

Research Question 1. Is the EL special education enrollment disproportionate when compared to either the total enrollment proportion of EL students in the district, their White peers, or native English-speaking peers?

For each of the comparison groups, I examined the question at the district level and within the district area. The district is split into smaller areas, mostly based on geographic lines. One area is dedicated to serving campuses have a history of poor academic performance, and students are considered highly at-risk. I used the 2017-2018 area boundaries for all five years. Not all students in the data set were coded to the most recent boundary areas. To capture these students, I created a separate district area. This area also includes students who are receiving services out of the district, but for monitoring purposes, remain enrolled as a student.

The district enrollment increased between the 2014 and 2016 school years, with decreases in 2017 and 2018. The EL enrollment for the district increased between 2014 and 2017, with a decrease in 2018. The special education enrollment continuously declined between 2014 and 2018, with a 4.2 % decrease over the five years. The area dedicated to struggling campuses had the highest proportion of special education students, though it declined between 2014-2016, and remained relatively stable in 2017 and 2018. I observed two unique EL enrollment patterns in the district. There was one district that had the highest EL enrollment for all five years. The enrollment EL proportion grew each year, ending at 42.7% in 2018. In Area &, I observed a pattern of increasing and decreasing EL enrollment between years, breaking from the resit of area patterns on continuous increases. Enrollment tables by district areas are in Appendix A.

Composition Index (Donovan and Cross, 2002) and Risk Index and Risk Ratio (Albrecht et al., 2012) have been considered reliable measures of disproportionality if there are more than ten students in the group being measured (Albrecht et al., 2012). Just as important, these three measures are considered efficient and practical (Skiba et al., 2008) and have been recommended by OSEP (Albrecht et al., 2012). All results for the Composite and Risk indices and the Risk Ratios are found in Table 6.

District Enrollment

Composite Index. The EL student group was examined from the perspective of underrepresentation, proportional representation, or overrepresentation in special education programs. I repeated the same process for White, non-EL students and minority, non-EL student groups. The composite indices were derived to describe the proportional representation in general education and special education and then compared to determine the proportional representation. If the general education composite index was ten % lower than special education, the group is considered underrepresented (Chin and Hughes, 1987). If the group falls between ten percent under or the group is ten percent over, the group is proportionally represented in special education. However, if the composite index is over ten percent% of the special education enrollment, the group is considered overrepresented.

I confirmed the trend of EL students being consistently underrepresented in the district's special education programming from 2014 to 2018. Conversely, White, native English speaking students were also proportionately enrolled in special education in years 2014 to 2015 but were underrepresented in years 2016 to 2018. For minority students who were native English speaking, this group was overrepresented in special education for all five years included in the study. The overrepresentation indicates that language is less likely to be a risk factor than race.

Risk Index and Risk Ratios. EL students are at lower risk of being identified as needing special education compared to their native-speaking peers. Evidence found Table 6 provides the risk ratios for EL students compared to students who speak English as a first language, both White and all other races. In 2014 and 2015, minorities who spoke English were twice as likely to be identified as special education students. Across all five years, the group that was the least likely to be identified as special needs was the White, native English speaking students.

Area Enrollment

Beyond district enrollment, I disaggregated EL enrollment by the district areas. I found distinct differences in the area EL enrollment trends versus district aggregation.

Mainly, the risk of EL students being placed in special education programming, when compared to their native English-speaking peers, varied by the area they were enrolled. Area North had the highest risk of ELs being placed in special education from 2014 to 2018. Even with the highest risk in the district, EL students were still less than a 50% chance they would be enrolled in special education programming compared to native English-Speaking students. The area with the lowest risk was Area Other, followed by Area Academic. Neither of these two areas are geographically defined and include students from all over the district. The next research question will predict if an EL student will be enrolled in special education classes, controlling for student and school characteristics.

Table 6

Composite Indices and Relative Risks for EL, White Non-EL, and Non-EL Students by Year, 2014 to 2018

Year	Student Group	EL Status	District Enrollment	Special Education Enrollment	Other General Education Enrollment	Other Special Education Enrollment	Composite Index - District	Composite Index - Special Education	EL Risk Index	Other Risk Index	EL Relative Risk for Special Education Compared to Other
2013-2014	EL	Yes	64,046	4,209	59,837	13,515	0.308*	0.237	0.066	0.226	0.29
	White Non-EL	No	15,268	1,235	14,033	16,489	0.073	0.070	0.081	1.175	0.07
	Minority Non-EL	No	128,786	12,280	116,506	5,444	0.619**	0.693	0.095	0.047	2.04
	District Total		208,100	17,724							
2014-2015	EL	Yes	65,315	4,061	61,254	13,662	0.309*	0.229	0.062	0.223	0.29
	White Non-EL	No	15,473	1,196	14,277	16,527	0.073	0.067	0.077	1.158	0.07
	Minority Non-EL	No	130,276	12,466	117,810	5,257	0.617**	0.703	0.096	0.045	2.04
	District Total		211,064	17,723							
2015-2016	EL	Yes	66,531	4,004	62,656	13,720	0.314*	0.232	0.060	0.219	0.27
	White Non-EL	No	16,155	1,151	14,989	16,573	0.076*	0.067	0.071	1.106	0.06
	Minority Non-EL	No	128,969	12,097	117,479	5,627	0.609**	0.701	0.094	0.048	1.96
	District Total		211,655	17,252							
2016-2017	EL	Yes	69,968	4,046	66,405	13,678	0.331*	0.237	0.058	0.206	0.28
	White Non-EL	No	16,208	1,168	15,352	16,556	0.077*	0.068	0.072	1.078	0.07
	Minority Non-EL	No	125,296	11,864	114,375	5,860	0.592**	0.695	0.095	0.051	1.85
	District Total		211,472	17,078							
2017-2018	EL Students	Yes	67,888	4,028	63,856	13,696	0.326*	0.237	0.059	0.214	0.28
	White Non-EL	No	16,374	1,184	15,435	16,540	0.079*	0.070	0.072	1.072	0.07
	Minority Non-EL	No	125,727	11,764	114,179	5,960	0.604**	0.693	0.094	0.052	1.79
	District Total		209,989	16,976							

* *Indicates special education composite indices are under the 10% threshold of the district composite.*

** *Indicates special education composite indices are over the 10% threshold of the district composite.*

Research Question 2. What is the probability of a student being identified as special education as a function of their EL classification, controlling for the student and school characteristics?

I ran likelihood-ratio tests after estimation for the models, per year and a regression with all years, to determine which variables fit the data the best. I began with the outcome variable, added the EL indicator, and continued to add my control variables one by one. To determine the best fit, I used the chi^2, the Pseudo R^2, and the Prob>chi^2 must have been <0.05. I found including all my control variables was a better fit at than a model which just included the DV and IV. After the *p*-value was tested, I looked for the highest chi^2 and $Psuedo^2$, as indicated in the methods chapter.

Tables 7-13 include the logistic regression summer for each year in the sample and two with all years. In total, 15 variables were used in 2013-2014 and 16 used in the years 2014-2015 to 2017-2018. The added variable in the last four years includes the previous year's special education enrollment composite index by campus; thus, the first year would not have this variable. Regarding the model using all years from 2014-2018, the previous special education years were not included, but the school year was, for a total of 16 variables. For the last regression, to explore the relationship between EL students and the ESL and Bilingual programs, the ESL and Bilingual programs were dropped, for a total of 14 variables. The higher absolute value of coefficients indicates higher weight in predicting whether a student will be enrolled in special education. The farther from zero, the greater the impact. If the coefficient is positive, the predictor variable has more chance to be enrolled in special education, while a negative coefficient has a decreased chance. The odds ratio indicates how the special education will change with one unit of change in the predictor variables, holding all other variables constant.

Logistic Regression Results

Table 7

Logistic Regression Summary, 2013-2014

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Constant	-0.35	0.71	0.12	-2.95	0.00**
EL Status	0.62	1.85	0.06	10.98	0.00**
Bilingual Status	-1.37	0.26	0.05	-29.33	0.00**
ESL Status	-1.00	0.37	0.05	-23.13	0.00**
Economically Disadv.	-0.10	0.91	0.02	-4.38	0.00**
Migrant Status	-0.13	0.88	0.26	-0.51	0.62
Immigrant Status	-1.28	0.28	0.10		**
Gender (F)	0.75	2.12	0.02	44.06	0.00**
% of Hispanic Tchrs	0.01	1.01	0.00	10.12	0.00**
% of White Tchrs	0.00	1.00	0.00	-2.57	0.03*
Distance from City	-0.01	0.99	0.00	-2.94	0.01**
Attendance Rate (%)	-3.43	0.03	0.08	-42.35	0.00**
Federal Race					
Asian/HPI	-0.73	0.48	0.09	-8.82	0.00**
African American	0.20	1.22	0.04	5.29	0.00**
Hispanic	0.00	1.00	0.04	-0.07	0.93
Multiple Races	-0.17	0.84	0.10	-1.72	0.09
Other/Unknown	-0.13	0.88	0.20	-0.59	0.53
District Areas					
Area East	-0.28	0.76	0.03	-8.29	0.00**
Area North	-0.19	0.83	0.03	-5.74	0.00**
Area Northwest	-0.26	0.77	0.03	-7.86	0.00**
Area South	-0.21	0.81	0.03	-6.83	0.00**
Area West	-0.19	0.83	0.03	-6.32	0.00**
Area Other	0.05	1.05	0.07	0.63	0.53
Home Language					
Spanish	-0.15	0.86	0.03	-5.53	0.00**
Arabic	-0.17	0.85	0.15	-2.56	0.28
Vietnamese	0.33	1.38	0.16	2.09	0.04*
Other	-0.32	0.73	0.08	-5.57	0.00**
Unknown	-0.47	0.62	0.07	-7.08	0.00**
School Level					
Middle School	0.22	1.24	0.03	7.92	0.00**
High School	0.20	1.22	0.03	7.14	0.00**
Combination	-0.08	0.92	0.04	-2.31	0.02*

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Years in U.S. Schools					
2	-0.91	0.40	0.46	-3.42	0.05*
3	0.23	1.26	0.08	3.69	0.00**
4	0.41	1.51	0.08	6.80	0.00**
5	0.52	1.68	0.08	8.88	0.00**
6	0.82	2.26	0.08	13.52	0.00**
7	1.08	2.95	0.07	18.89	0.00**
N/A (Started in the U.S.)	0.18	1.20	0.07	4.14	0.00**

Note: In 2013-2014, there were 208,100 observations. The Likelihood Ratio = 7,936.33, Pseudo R^2 *= 0.06, and Probability >* chi^2 *= 0.00.*
*** p<.01, * p<.05*

Table 8

Logistic Regression Summary, 2014-2015

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Constant	-0.31	0.74	0.12	-2.58	0.01*
EL Status	0.58	1.78	0.06	9.83	0.00**
Bilingual Status	-1.47	0.23	0.05	-31.48	0.00**
ESL Status	-0.97	0.38	0.05	-19.02	0.00**
Economically Disadv.	-0.08	0.93	0.02	-3.42	0.00**
Migrant Status	0.00	1.00	0.24	0.00	1.00
Immigrant Status	-1.33	0.27	0.09	-14.31	0.00**
Gender (F)	-0.75	0.48	0.02	-43.63	0.00**
% of Hispanic Tchrs	0.01	1.01	0.00	10.09	0.00**
% of White Tchrs	0.00	1.00	0.00	2.84	0.01**
Distance from City	0.01	1.01	0.00	4.13	0.00**
Attendance Rate (%)	-3.09	0.05	0.08	-38.53	0.00**
13-14 Campus Sped %	10.05	23,203.24	0.24	42.42	0.00**
Federal Race					
Asian/HPI	0.17	1.18	0.04	4.33	0.00**
African American	-0.09	0.92	0.20	-0.44	0.66
Hispanic	-0.76	0.47	0.08	-9.14	0.00**
Multiple Races	-0.02	0.98	0.04	-0.63	0.53
Other/Unknown	-0.23	0.80	0.10	-2.30	0.02*
District Areas					
Area East	0.13	1.14	0.03	3.78	0.00**
Area North	0.09	1.09	0.03	2.66	0.01**
Area Northwest	0.07	1.07	0.03	2.10	0.04*
Area South	0.01	1.01	0.03	0.16	0.87*
Area West	0.08	1.08	0.03	2.53	0.01

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
District Areas (cont.)					
Area Other	-1.05	0.35	0.11	-9.86	0.00*
Home Language					
Spanish	-0.10	0.90	0.03	-3.63	0.00**
Arabic	-0.16	0.85	0.15	-1.13	0.26
Vietnamese	0.25	1.29	0.16	1.55	0.12
Other/Unknown	-0.47	0.63	0.06	-8.32	0.00**
School Level					
Middle School	0.00	0.92	0.03	-3.21	0.00**
High School	-0.09	0.82	0.03	-7.05	0.00**
Combination	-0.19	0.91	0.04	-2.65	0.01**
Years in U.S. Schools					
2	-0.79	0.45	0.46	-1.71	0.09
3	0.13	1.14	0.08	1.68	0.09
4	0.26	1.29	0.08	3.38	0.00**
5	0.55	1.74	0.07	7.47	0.00**
6	0.68	1.98	0.08	8.78	0.00**
7	0.87	2.39	0.07	11.92	0.00**
N/A (Started in the U.S.)	0.10	1.10	0.07	1.41	0.16

Note: In 2014-2015, there were 211,064 observations. The chi-square = 10,284.93 and the Pseudo R^2 = 0.08. The probability > chi^2 = 0.00.

*** $p<.01$, * $p<.05$*

Table 9

Logistic Regression Summary, 2015-2016

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Intercept	-0.44	0.64	0.12	-3.63	0.00**
EL Status	0.62	1.87	0.06	10.50	0.00**
Bilingual Status	-1.48	0.23	0.05	-31.18	0.00**
ESL Status	-1.08	0.34	0.05	-21.76	0.00**
Economically Disadv.	0.01	1.01	0.02	0.31	0.76
Migrant Status	0.25	1.28	0.24	1.02	0.31
Immigrant Status	-1.13	0.33	0.08	-13.84	0.00**
Gender (F)	-0.77	0.46	0.02	-44.49	0.00**
% of Hispanic Tchrs	0.01	1.01	0.00	11.98	0.00**
% of White Tchrs	0.00	1.00	0.00	5.58	0.00**
Distance from City	0.01	1.01	0.00	4.08	0.00**
Attendance Rate (%)	-3.24	0.04	0.08	-41.08	0.00**
14-15 Campus Sped %	10.49	35,960.11	0.26	40.98	0.00**

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Federal Race					
Asian/HPI	0.21	1.24	0.04	5.32	0.00**
African American	-0.08	0.93	0.20	-0.38	0.70
Hispanic	-0.67	0.51	0.08	-8.31	0.00**
Multiple Races	0.01	1.01	0.04	0.23	0.82
Other/Unknown	-0.19	0.83	0.10	-1.96	0.05
District Areas					
Area East	0.14	1.15	0.04	3.98	0.00**
Area North	0.02	1.02	0.03	0.65	0.51
Area Northwest	0.06	1.06	0.04	1.65	0.10
Area South	-1.02	0.36	0.11	-8.96	0.00**
Area West	0.09	1.10	0.03	2.97	0.00**
Area Other	0.02	1.02	0.03	0.59	0.55
Home Language					
Spanish	-0.07	0.93	0.03	-2.53	0.01*
Arabic	-0.07	0.93	0.14	-0.49	0.63
Vietnamese	0.24	1.27	0.16	1.47	0.14
Other	-0.46	0.63	0.05	-8.59	0.00**
School Level					
Middle School	-0.13	0.88	0.03	-4.56	0.00**
High School	-0.27	0.77	0.03	-9.75	0.00**
Combination	-0.14	0.87	0.04	-3.81	0.00**
Years in U.S. Schools					
2	0.14	1.15	0.08	1.83	0.07
3	0.27	1.32	0.08	3.57	0.00**
4	0.47	1.61	0.08	6.13	0.00**
5	0.78	2.17	0.08	9.79	0.00**
6	1.05	2.86	0.07	14.36	0.00**
N/A (Started in the U.S.)	0.22	1.24	0.07	3.13	0.00**

Note: In 2015-2016, there were 211,655 observations. The chi-square = 10,616.86 and the Pseudo R^2 = 0.09. The probability > chi^2 = 0.00.

*** p<.01, * p<.05*

Table 10

Logistic Regression Summary, 2016-2017

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Intercept	-0.74	0.48	0.17	-4.32	0.00**
EL Status	0.78	2.19	0.05	16.86	0.00**
Bilingual Status	-1.60	0.20	0.05	-34.02	0.00*
ESL Status	-0.94	0.39	0.05	-19.60	0.00**

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Economically Disadv.	0.30	1.35	0.03	11.75	0.00**
Migrant Status	-0.28	0.76	0.28	-0.99	0.32
Immigrant Status	-1.26	0.28	0.07	-17.46	0.00**
Gender (F)	-0.80	0.45	0.02	-45.61	0.00**
% of Hispanic Tchrs	0.01	1.01	0.00	10.88	0.00**
% of White Tchrs	0.01	1.01	0.00	8.20	0.00**
Distance from City	0.01	1.01	0.00	4.40	0.00**
Attendance Rate (%)	-3.39	0.03	0.08	-40.77	0.00**
15-16 Campus Sped %	11.40	89,575.25	0.27	41.66	0.00**
Federal Race					
Asian/HPI	0.07	1.07	0.04	1.60	0.11
African American	-0.04	0.96	0.20	-0.19	0.85
Hispanic	-0.64	0.53	0.08	-7.88	0.00**
Multiple Races	-0.08	0.92	0.04	-2.05	0.04*
Other/Unknown	-0.16	0.86	0.09	-1.69	0.09
District Areas					
Area East	0.11	1.11	0.04	3.06	0.00**
Area North	0.06	1.06	0.03	1.82	0.07
Area Northwest	0.08	1.08	0.04	2.26	0.02*
Area South	-1.26	0.28	0.14	-9.32	0.00**
Area West	0.09	1.10	0.03	3.00	0.00**
Area Other	0.06	1.06	0.03	1.72	0.09
Home Language					
Spanish	0.35	1.43	0.14	2.59	0.01**
Arabic	-0.15	0.86	0.15	-0.99	0.32
Vietnamese	0.30	1.35	0.14	2.18	0.03*
Other	-0.01	0.99	0.16	-0.08	0.94
Unknown	0.48	1.61	0.21	2.29	0.02*
School Level	0.00	1.00	.	.	.
Middle School	-0.14	0.87	0.03	-5.17	0.00**
High School	-0.25	0.78	0.03	-9.22	0.00**
Combination	-0.04	0.96	0.04	-1.03	0.30
Years in U.S. Schools					
2	-0.02	0.98	0.06	-0.33	0.74
3	-0.11	0.90	0.06	-1.85	0.07
4	-0.08	0.92	0.06	-1.36	0.17
5	-0.01	1.00	0.07	-0.07	0.94
6	0.19	1.21	0.05	3.56	0.00**
N/A (Started in the U.S.)	0.09	1.10	0.04	2.31	0.02*

Note: In 2016-2017, there were 211,472 observations. The chi-square = 10,421.92 and the Pseudo R^2 = 0.09. The probability > chi^2 = 0.00.

*** p<.01, * p<.05*

Table 11

Logistic Regression Summary, 2017-2018

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Intercept	-0.57	0.56	0.18	-3.20	0.00**
EL Status	0.41	1.50	0.06	6.54	0.00**
Bilingual Status	-1.33	0.27	0.05	-27.52	0.00**
ESL Status	-1.13	0.32	0.05	-22.70	0.00**
Economically Disadv.	0.31	1.37	0.03	10.10	0.00**
Migrant Status	-0.53	0.59	0.43	-1.23	0.22
Immigrant Status	-0.82	0.44	0.09	-9.27	0.00**
Gender (F)	0.77	2.15	0.02	43.85	0.00**
% of Hispanic Tchrs	0.01	1.01	0.00	12.21	0.00**
% of White Tchrs	0.01	1.01	0.00	8.37	0.00**
Distance from City	0.01	1.01	0.00	3.85	0.00**
Attendance Rate (%)	-3.30	0.04	0.08	-41.44	0.00**
16-17 Campus Sped %	10.72	45,157.25	0.27	39.80	0.00**
Federal Race					
Asian/HPI	0.12	1.13	0.04	2.96	0.00**
African American	-0.01	0.99	0.21	-0.04	0.96
Hispanic	-0.61	0.55	0.08	-7.72	0.00**
Multiple Races	0.04	1.04	0.04	0.96	0.34
Other/Unknown	-0.12	0.89	0.09	-1.30	0.20
District Areas					
Area East	-0.02	0.98	0.04	-0.62	0.54
Area North	0.00	1.00	0.03	0.09	0.93
Area Northwest	0.01	1.01	0.03	0.30	0.77
Area South	-0.02	0.98	0.03	-0.60	0.55
Area West	0.05	1.05	0.03	1.71	0.09
Area Other					
Home Language					
Spanish	0.11	1.12	0.13	0.87	0.38
Arabic	-0.32	0.72	0.15	-2.23	0.03*
Vietnamese	-0.04	0.96	0.13	-0.34	0.73
Other	-0.14	0.87	0.14	-1.04	0.30
Unknown	0.40	1.49	0.20	1.98	0.05*
School Level	0.00	1.00	.	.	.
Middle School	-0.22	0.81	0.03	-7.78	0.00**
High School	-0.29	0.75	0.03	-10.67	0.00**
Combination	-0.09	0.92	0.04	-2.40	0.02*

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Years in U.S. Schools					
2	0.37	1.45	0.08	4.74	0.00**
3	0.39	1.48	0.08	4.96	0.00**
4	0.42	1.53	0.08	5.35	0.00**
5	0.74	2.09	0.08	9.21	0.00**
6	1.17	3.24	0.07	16.11	0.00**
N/A (Started in the U.S.)	0.20	1.22	0.07	2.67	0.01**

Note: In 2017-2018, there were 209,933 observations. Area Other was dropped due to collinearity. The chi-square = 9,720.35 and the Pseudo R^2 *= 0.08. The probability >* chi^2 *= 0.00.*

*** p<.01, * p<.05*

Table 12

Logistic Regression Summary, 2014-2018

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Intercept	1.52	4.56	0.05	29.17	0.00**
EL Status	0.83	2.29	0.02	38.69	0.00**
Bilingual Status	-1.56	0.21	0.02	-76.21	0.00**
ESL Status	-0.93	0.40	0.02	-44.04	0.00**
Economically Disadv.	0.06	1.06	0.01	6.35	0.00**
Migrant Status	-0.02	0.98	0.12	-0.19	0.85
Immigrant Status	-1.34	0.26	0.04	-35.57	0.00**
Gender (F)	-0.46	0.63	0.01	-61.90	0.00**
% of Hispanic Tchrs	0.01	1.01	0.00	17.70	0.00**
% of White Tchrs	0.00	1.00	0.00	-9.94	0.00**
Distance from City	0.00	1.00	0.00	-1.93	0.05
Attendance Rate (%)	-3.18	0.04	0.03	-96.31	0.00**
Federal Race					
Asian/HPI	0.18	1.19	0.02	10.26	0.00**
African American	-0.59	0.55	0.03	-18.04	0.00**
Hispanic	-0.01	0.99	0.02	-0.37	0.71
Multiple Races	-0.14	0.87	0.04	-3.44	0.00**
Other/Unknown	-0.07	0.93	0.09	-0.79	0.43
District Areas					
Area East	-0.19	0.83	0.02	-12.74	0.00**
Area North	-0.15	0.86	0.02	-10.60	0.00**
Area Northwest	-0.23	0.80	0.02	-15.50	0.00**
Area South	-0.29	0.75	0.02	-17.72	0.00**

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
District Areas (cont.)					
Area West	-0.22	0.81	0.01	-16.84	0.00**
Area Other	-0.26	0.77	0.02	-14.00	0.00**
Home Language					
Spanish	-0.27	0.90	0.03	-8.81	0.00**
Arabic	-0.52	0.80	0.06	-9.28	0.00**
Vietnamese	-0.26	0.59	0.04	-7.13	0.00**
Other	-0.52	0.78	0.03	-16.66	0.00**
Unknown	-0.53	0.60	0.05	-10.88	0.00**
School Level					
Middle School	0.21	1.00	0.01	18.70	0.00**
High School	0.05	1.23	0.01	4.12	0.00**
Combination	-0.10	1.05	0.02	-5.94	0.00**
Years in U.S. Schools					
2	0.21	1.00	0.04	5.94	0.00**
3	0.14	1.23	0.03	4.54	0.00**
4	0.22	1.16	0.03	6.98	0.00**
5	0.40	1.25	0.03	12.51	0.00**
6	0.66	1.49	0.03	22.75	0.00**
N/A (Started in the U.S.)	0.38	1.94	0.03	15.28	0.00**
School Year					
2014-2015	-0.48	1.09	0.01	-35.17	0.00**
2015-2016	-0.77	1.00	0.02	-35.65	0.00**
2016-2017	-0.69	0.62	0.03	-27.97	0.00**
2017-2018	-0.90	0.47	0.03	-36.23	0.00**

Note: In 2014-2018, there were 1,052,280 observations, with 360,790 students. The chi-square = 9,720.35 and the Pseudo R^2 = 0.08. The probability > chi ^{2} = 0.00.
*** p<.01, * p<.05*

Table 13

Logistical Regression Summary without ESL and Bilingual Variables, 2014-2018

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
Intercept	1.59	4.97	0.05	29.17	0.00**
EL Status	0.83	0.78	0.02	38.69	0.00**
Economically Disadv.	-1.56	1.07	0.02	-76.21	0.00**
Migrant Status	-.93	1.02	0.02	-44.04	0.00**
Immigrant Status	0.06	0.27	0.01	6.35	0.00**
Gender (F)	-0.02	0.63	0.12	-0.19	0.85
% of Hispanic Tchrs	-1.34	1.00	0.04	-35.57	0.00**

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
% of White Tchrs	-0.46	1.00	0.01	-61.90	0.00**
Distance from City	0.01	1.00	0.00	17.70	0.00**
Attendance Rate (%)	-0.00	0.04	0.00	-9.94	0.00**
Federal Race					
Asian/HPI	0.18	1.20	0.02	10.42	0.00**
African American	-0.58	0.56	0.03	-17.71	0.00**
Hispanic	0.02	1.02	0.02	1.16	.25
Multiple Races	-0.15	0.86	0.04	-3.60	0.00**
Other/Unknown	-0.03	0.97	0.09	-0.38	.70
District Areas					
Area East	-0.16	0.85	0.02	-10.77	0.00**
Area North	-0.13	0.88	0.01	-8.85	0.00**
Area Northwest	-0.22	0.81	0.02	-14.71	0.00**
Area South	-0.29	0.75	0.02	-17.86	0.00**
Area West	-0.21	0.81	0.01	-16.30	0.00**
Area Other	-0.26	0.77	0.02	-13.99	0.00**
Home Language					
Spanish	-0.26	0.91	0.03	-10.31	0.00**
Arabic	-0.44	0.77	0.06	-7.82	0.00**
Vietnamese	-0.26	0.64	0.04	-7.16	0.00**
Other	-0.48	0.77	0.03	-15.31	0.00**
Unknown	-0.47	0.62	0.05	-9.59	0.00**
School Level					
Middle School	0.27	1.31	0.01	24.02	0.00**
High School	0.08	1.09	0.01	7.37	0.00**
Combination	-0.08	0.92	0.02	-4.99	0.00**
Years in U.S. Schools					
2	0.27	1.31	0.04	7.73	0.00**
3	0.20	1.22	0.03	6.35	0.00**
4	0.31	1.36	0.03	9.67	0.00**
5	0.56	1.74	0.03	17.55	0.00**
6	0.90	2.46	0.03	31.77	0.00**
7	0.46	1.58	0.03	18.45	0.00**
N/A (Started in the U.S.)	0.07	1.07	0.03	2.39	0.02*
School Year					
2014-2015	-0.48	0.62	0.01	-35.66	0.00**
2015-2016	-0.86	0.42	0.02	-40.14	0.00**

Predictor Variables	*B*	Odds Ratio	SE	z	*p*
School Year (cont.)					
2016-2017	-0.78	0.46	0.02	-31.85	0.00**
2017-2018	-1.02	0.36	0.02	-41.15	0.00**

Note: In 2014-2018, there were 1,052,280 observations, with 360,790 students. The chi-square = 9,720.35 and the Pseudo R^2 *= 0.08. The probability >* chi^2 *= 0.00.*
*** p<.01, * p<.05*

One of the measures for model performance is the post-estimation test, classification. The test produces a classification table that shows how many observations in the model were or were not classified as special education compared to how many observations the model correctly predicted to be or not to be classified as a special education student. With any model, the goal is to predict the observations based on the model variables. The sensitivity of a model indicates how accurately the model predicted which students would be enrolled in special education. The specificity represents how many students were correctly predicted not to be in special education. The final statistic is an overall correct classification rate. This post estimation test includes a cutoff of 0.5. That is, the observations with the probability 0.5 will be predicted as being enrolled in special education, and all the other probabilities will be predicted as not being enrolled in special education. Results from the classification post-estimation test are found in Table 14.

Table 14

Logistic Regression Post-Estimation Classification Results, 2014-2018

School Year	Sensitivity Rate	Specificity Rate	Correctly Predicted
2013-2014	1.48%	99.88%	91.50%
2014-2015	2.02%	99.87%	91.65%
2015-2016	2.23%	99.87%	91.91%
2016-2017	2.17%	99.88%	91.99%

School Year	Sensitivity Rate	Specificity Rate	Correctly Predicted
(Continued)			
All Years	1.36%	99.87%	91.75%
All Years*	1.37%	99.87%	91.75%

** Does not include ESL and Bilingual variables*

The logistic models fit the data well and predicted outcomes at a 91.5% rate, the number of children who will not be in special education. Even with removing the ESL and the Bilingual variables, the model's predictability, sensitivity, and specificity did not change. The successful prediction rate of students enrolled in speciation education varied by year and ranged from 1.48% to 2.23%. Effectively, I could not create a model that would predict whether an EL student would be co-identified as needing special education services. Table 15 shows the changes in the EL coefficient and probability of an EL student enrolled in special education services.

Table 15

Logistic Regression Results for EL Students, 2014-2018

School Year	*B*	Odds Ratio	*p*
2013-2014	0.62	1.85	0.00**
2014-2015	0.58	1.78	0.00**
2015-2016	0.62	1.87	0.00**
2016-2017	0.78	2.19	0.00**
2017-2018	0.41	1.50	0.00**
All Years	0.83	2.29	0.00**
All Years*	0.83	0.78	0.00**

**ESL and Bilingual variables were not included in the regression model*

The probability of an EL student being enrolled in special education was low through the five-year models but were highest when looking at all observations of the five school years together. Additionally, the removal of the ESL and Bilingual variables had no change on the coefficient for EL students but decrease the probability of an EL student being enrolled in special education services. The probability of dual enrollment was highest when all five school years were combined, but lowest when ESL and Bilingual variables were removed. Further exploration needs to be conducted but this lends to the idea that enrollment in these two programs have a more impact on than simply and EL classification when trying to identify if students learning English will also be enrolled in special education.

Research Question 3. What is the probability of an EL student who is co-identified as disabled being classified with a high incidence category of disability including specific learning disabled (SLD), emotional or behavior disorder (ED), and intellectually disabled (ID), and Speech, controlling for the student and school characteristics?

I applied a multinomial logistic regression given the outcome had five possible disabilities to which had the students were classified. The first classification combined all the low incidence disabilities into one category. The low incidence group included disability categories such as vision and hearing issues. Low incidence disabilities tend to be physical rather than psychological. The four other categories included in the study were Emotional Disturbance (ED), Intellectually Disabled (ID), Specific Learning Disorders (SLD), and Speech Impairment (Speech). These four categories are considered high incidence because most of the students who qualify for special education qualify under one or more of these disabilities. These four categories are also regarded as partially subjective and include observational data when completing a qualifying disability assessment. To predict whether an EL student qualified for special education under each high incident category, I applied the same predictor variables each year, as I did in the second research question. The disability category provided the primary disability, which each special education student qualified under, even if the student had multiple disabilities. So, each student was only captured once within the analysis per year.

As with my second research question, I applied a logistic regression model test to determine the best fit for the predictor variables (Table 16). The difference is the outcome is categorical, rather than dichotomous, requiring a multinomial logistic regression. I conducted a likelihood chi-square test and determined the best model included all the predictor variables. Each year model, the LR chi^2 was compared to a model with no predictors. The probability the no predictors model was greater than the model with the predictor variables was Prob > chi^2 = 0.00. I found that at least one of the regression slopes being tested was not equal to zero. Table 18 has the LR chi^2 test for each year. All multinomial logistic regression tables are in Appendix D.

Table 16

Model Loglikelihood Ratio Test Results, 2014-2018

		Log-likelihood			
Year	N	No Predictors	Model	df	*p*-value
2014	22,200	-29,468.80	-25,525.60	152	0.00
2015	22,464	-29,691.37	--25,799.56	152	0.00
2016	22,257	-29,247.68	-25,329.30	148	0.00
2017	21,947	-29.036.24	-25,551.38	152	0.00
2018	21,740	-28,7043.15	-24,933.85	152	0.00

Note: The N was the number of special education students per year.

The likelihood EL students would qualify under a high incidence special education category varied by category and school years. The coefficients and odds ratios for the EL student group are in Table 19. For multinomial logistic regression, each special education disability category was treated as an independent binary category, and thus I used odds ratios instead of risk ratios in the results (Long & Freese, 2006).

Multinomial Logistic Regression Results

Table 17

Probability of EL Students Classified with High Incidence Special Education Disabilities

Year	Disability Category	*B*	EL Odds Ratio	SE.	*z*	*p*
2014	ED	0.35	0.35	0.44	0.79	0.42
	ID	0.35	1.42	0.44	0.79	0.43
	SLD	-0.66	0.52	0.15	-4.29	0.00**
	Speech	1.34	3.81	0.14	9.66	0.00**
2015	ED	-0.35	0.21	0.21	-1.70	0.09
	ID	0.31	1.36	0.51	0.60	0.55
	SLD	-1.04	0.35	0.18	-5.67	0.00**
	Speech	1.55	4.72	0.15	10.71	0.00**
2016	ED	0.03	1.03	0.18	0.14	0.89
	ID	0.48	1.61	0.46	1.03	0.30
	SLD	-0.78	0.46	0.18	-4.39	0.00**
	Speech	1.26	3.54	0.15	8.68	0.00**
2017	ED	-0.30	0.75	0.12	-2.45	0.01*
	ID	1.06	2.88	0.26	4.02	0.00**
	SLD	0.80	0.05	0.09	9.21	0.00**
	Speech	0.52	1.68	0.13	4.11	0.00**
2018	ED	-0.16	0.85	0.20	-0.78	0.44
	ID	0.37	1.45	0.50	0.74	0.46
	SLD	-0.26	0.77	0.19	-1.41	0.16
	Speech	1.66	5.27	0.15	11.13	0.00**

* $p < 0.05$
** $p < 0.01$

The coefficients associated with the EL student group provide a likelihood that the EL student will either have a high incidence disability or not have a disability.

However, not all EL coefficients were statistically significant. Odds Ratios represent the risk of falling into the base outcome (low incidence disabilities) per one unit change in an independent variable. My research question focused on EL students only. I included the odds ratio for ELs falling into high incidence categories in Table 19. If the odds ratio is greater than one, the EL student has a higher risk of having that primary disability than non-EL special education students. Alternatively, if the odds ratio is less than one, the EL student is less likely to be classified with the disability than non-EL special education students.

For all five years, EL special education students were predicted to be disabled with a speech impairment more than any other disability compared to non-EL special education students. The odds ratio for 2014 was 3.81 ($p<0.05$); 2015 was 4.72 ($p<0.05$); 2016 was 3.54 ($p<0.05$); 2017 was 1.68 ($p<0.05$) and 2018 was 5.27 ($p<0.05$).

Regarding SLD disabilities, four out of the five years were statistically significant. The odds an EL student would have SLD as primary disability ranged from 0.52 ($p<0.05$) to 0.05 ($p<0.05$) in 2017, making them less likely than non-El students to qualify. In 2017, EL students were 25 percent less likely to be disabled under ED than non-EL special education students ($p<0.05$). Additionally, in 2017 EL students 2.88 ($p<0.05$) times more likely to be intellectually disabled.

CHAPTER V

CONCLUSIONS

Introduction

Chapter V includes a study summary, an overview of the results, implications for practice, and further research recommendations. The point of the chapter is to expand on concepts explored in the study impart a study conclusion. The study provided an opportunity to analyze data and furnish ideas for potential leadership practice.

Disproportionate enrollment in special education has been a longstanding issue (Artiles, et al., 2010; Ball et al., 2014; Sullivan & Bal, 2013;). The issue has become prominent enough for the federal government to create policies which monitor special education enrollment to increase equity among all school children. Special education equity is a broad subject manner. However, this study focuses on access to additional resources found in special education through an exploration of enrollment trends of EL students in a single school district. Included in the study was a brief equity EL enrollment audit and considered what student and school characteristics could help identify children in need of both language and disability services.

Most published research focuses on race as a major factor in disproportionate special education programming. As mandated by OSEP (2017) and IDEA, guidelines have been created to monitor enrollment patterns by race. Nevertheless, race is only one student demographic. More researchers have broadened the analysis of special education enrollment over the past decade, concentrating on English Language Learners (EL). Despite the new interest in EL students, the research on EL enrollment in special education has been limited (Linan-Thompson, 2010; Sullivan, 2011, Sullivan & Bal, 2013; Valenzuela et al., 2006; Waitoller et al., 2010). Research is mixed depending on the school level (federal, state, or local), which is being examined (Sullivan, 2011; Sullivan & Bal, 2013). With an increase in students who are identified as EL and special education (ED, 2018), it is important to continue research on this specific student population.

Study Summary

Special education equity is a broad subject, but the focus of this study was on EL student enrollment in special education. Explored in the study was the relationship between students identified as EL and dually enrolled in special education programming. Three approaches were used to parse out the relationship: (a) a targeted equity audit for a large urban Texas district; (b) logistic regression to control school and student demographics to provide a likelihood an EL student would also be enrolled in special education; (c) multinomial regression to examine which high incidence disability would qualify an EL student for special education. The aim of the study was to determine if EL students were disproportionately represented in special education services within a local district context using disparate impact theory. With disparate impact theory, even if the policies appear to be neutral in design, if the outcomes are discriminatory, the policies' structures are considered discriminatory.

My intention was to build on research because there is a deficit of studies examining EL students' misrepresentation through a local district context (Sullivan and Bal, 2013). The aim of the study was to answer the following questions: (a) were EL students disproportionately enrolled in special education programs in the district as compared to their White non-EL peers; (b) what were the chances an EL student would be co-identified as qualifying for special education services, controlling for student and school demographics; and (c) what are the predicted odds an EL student will qualify for special education under a high incidence disability?

My results are delimited by only using one school district for the sample. The district was chosen for a variety of reasons. First, the school district is one of the largest school districts in Texas and in the United States, providing a large student sample to complete the study. Secondly, the school is very diverse and has a large portion of EL students. Third, the district also has unique characteristics unlike most other Texas school districts. The school district annexed a neighboring school district, which was considered failing, and was ordered to close by the state education agency. The annexation occurred in the summer prior to the 2013-2014 school year. Therefore, any outcomes following the annexation is represented in the data, specifically the North Area.

Another notable characteristic of the district occurred in 2016, when a local newspaper ran a critical expose series highlighting the district's special education enrollment policies and processes. This journalistic series garnered national attention and exposed an unofficial state cap of special education enrollment of 8.5%, much lower than the national average of special education enrollment. In 2016-2017, shortly after the expose series began, the U.S. Department of Education came to Texas and began an investigation into the allegations the school district purposely made it difficult to qualify, enroll, and receive special education services and resources. Additionally, public policy changes were prompted by the newspaper expose resulting in the state education agency removing of the state cap on special education enrollment in 2017. In 2018, the U.S. Department of Education found the district in violation of federal special education laws.

The exposure of the school district and the state special education policies occurred after the district had been chosen for the study, but prior to the completion of the study. The journalist penning the series alleged the district purposely made it difficult for families to seek an evaluation and/or qualify for special education services; with the state special education cap being a primary foundation for the difficult qualification process. The city newspaper articles aligned well to the study theoretical work of disparate impact. Applying the theory to the allegations brought up by the local newspaper, the school district had designed policies which prevented a fair enrollment into the district's special education services. While the expose included all students, the focus of the study was on the outcome of the district's policies and procedures on the EL population.

Five years were included in the study from 2014 through 2018. In all, *360,790* 3 unique students were included in the sample. Of those students, there were 120,924 EL students enrolled over the period. The school district provided data that included both student and campus-level data. Not included in the study was academic performance nor policies related to how the district and campuses qualify students for special education. The focus of the study was only on the district enrollment outcomes.

To address the research question examining the enrollment proportions for EL students, I compared EL students of all ethnicities to White, native English speaking students. I applied composite and risk indices to calculate final risk ratios. For the risk ratios, any number above 1.0 indicates the student group is more likely to be in special education than their comparison group. Conversely, if the risk ratio is below 1.0, the student group is less likely to be enrolled in special education than the comparative group.

To determine which predictor variables to use in the research questions two and three, I applied an LR chi-square test. The predictor variables were my independent variables of student and school demographics that were controlled in the regressions. The second research question addressed the likelihood of an EL student co-qualifying for special education, controlling for school and student demographics. For the last research question, I chose the four primary disabilities with the highest enrollment of students in the district. The four primary disabilities were consistent for all five years and are considered high-incidence categories across the country. For the comparative category, I combined all the low incidence disabilities into one group. Given these study boundaries, the results cannot be generalized to state or federal patterns. I used Chin and Hughes (1987) disproportionate threshold and not the state's guidelines. Therefore, the results may not match other reports.

Results Summary

EL students had 71%-73% less risk of enrollment in special education programs as compared to White native English speaking peers during 2014 to 2018 school years.

During the same five school years, EL students were also disproportionately under-represented in the school district's special education programs. There was variance in the risk ratios for EL students between the inner district areas. Area North consistently had the highest risk ratio for EL students, but they were still half as likely to be enrolled in special education programming as their comparative group. Ideally, the inner school district areas should have the same representation because the district has centralized policies and procedures for identifying and qualifying students for special education. The differences in the inner district areas showed the likelihood of an EL student accessing special education program was impacted by at least one school characteristic – the geographic location.

Composite and risk indices, combined with risk ratios, have limitations to the outcome interpretation because the method does not control other variables. When controlling for student and school demographics in the second research question, EL students had an increased risk of being dually enrolled in special education in all five years. Furthermore, several student and school characteristics were more likely to be included when an EL student qualified for special education services. These predictor variables depended on the school year. From 2014 to 2018, enrollment in high school or a combination school, an Asian/Hawaiian Pacific Islander ethnicity, and if the student was coded as economically disadvantaged, there was an increased likelihood that a student would be concurrently identified as and EL student and enrolled in special education programs ($p<0.05$). The last predictor variable associated with a higher risk of concurrent enrollment was the number of school years the student had been enrolled in the U.S. For students who had never been enrolled in the U.S. before or were enrolled for 3 or more years, were found to have an increased risk of being co-identified as EL and in special education ($p<0.05$).

For both regressions to answer research questions 2 and 3, the same controlled variables were used to determine EL students' primary disability qualification. Over the five years, when EL students did qualify for special education programming, they were most likely to qualify under speech impairments. There was one year when the results were unique compared to the other four, 2017. There was a spike in the odds an EL student would qualify for special education, and the type of disability the student would have. For example, from 2014 through 2016, the odds an EL student qualified for special education increased from 1.85 times to 1.87. However, in 2017, these odds jumped to 2.19 times as likely and then dropped down to 1.5 times in 2018. In 2017, EL students were almost three times (2.88, $p<0.05$) more likely to have an ID disability than a low incidence disability. The odds an EL student qualified or ID was also higher than speech in 2017. Overall, speech impairment remained the likeliest disability for EL students who qualified for special education.

Implications for Practice

This study provided evidence that EL students were being identified for special education were at higher risk for being enrolled in special education as compared to their White non-EL peers but remain under-represented in special education. The under-representation could mean students who need services are not being identified and are missing out on critical resources needed to access the curriculum in an equitable way.

Bal et al. (2014) discussed this phenomenon of underrepresentation. They argued that the process could be influenced by inherent social and institutional factors, such as school climate and bias within the qualification process. Despite having a centralized special education qualifying process, the geographic location of student enrollment still shows variability in the identification of EL students needing special education resources. Furthermore, the U.S. Department and the Texas Education Agency found the district was not meeting IDEA special education requirements.

Several implications came after the study was conducted. These implications are based on previously published studies, the results of this study and included the context of failures within the district special education processes.

1. Before 2017, TEA had a limit on the proportion of special education students enrolled in the district, at 8.5%. DeMatthews and Knight (2019) concluded this limit prevented some students from qualifying for special education services. Although TEA attempts to monitor special education through the State Performance Plan and Annual Performance Report (SPP/APR), the U.S. Office of Special Education Programs determined Texas needed assistance when it came to the state's special education performance. TEA must also provide a determination of each local district with the SPP/APR report. The district in the study went from Needs Assistance in 2015 to Needs Intervention for the last three years of the sample period.

   Texas and individual school districts continue to need equity audits to ensure their policies and procedures create equitable opportunities for students to receive interventions when needed. The students should be provided a valid, bias-free assessment for special education qualification. Applying equity audits with risk ratios may help identify areas of concern for the district to make systematic changes.

2. The state and local school districts should be examining any disproportionate enrollment, including under-representation, such as the EL students in this district. For example, when controlling for school and social demographics, EL students are more at risk to qualify for academic intervention from special education, but were not proportionately enrolled in special education. The department that works with EL students should coordinate with the special education department to review their qualifying processes and determine potential areas needing changes, or if their processes of identification and qualification are being implemented with fidelity.

In addition to exploring centralized processes, teacher development in the areas of identification, intervention, and qualification of EL students should be addressed during professional development time. Administrators, teachers, and staff should be presented with training to understand potentially missed opportunities to provide EL students with the support they need to access their educational curriculum. However, school personnel are only one stakeholder when it comes to children's education. Strategic outreach to parents as a source of information should be a priority at all schools. Child find, the process of identifying if a student has a disability, should not only fall to the teachers. The district, and especially the individual campuses, should proactively and purposely reach out and create cooperative relationships with parents to help in the process of identification. The interface should be in the family's home language if possible.

3. The inner-district areas showed variance in their risk ratios of EL students enrolled in special education. The district should explore differences in how the areas apply their special education identification and qualifying processes. Controlling for school and student demographics, the risk of EL students who qualify for special education, and under what disability, should be relatively even. Given the areas' variance within the district, the differences between the geographic areas and schools should be examined. A child should not be kept from special education services because of where they live.

Recommendations for Future Research

I found evidence of underrepresentation of EL students in special education over five years, despite EL students having a higher risk when compared to their White non-EL peers or when controlling for a variety of variables. My model of student and school characteristics could not predict which EL students would be classified as needing special education. I have provided some future research practices that may complement this study and provide insight into existing disproportionality research.

1. More qualitative research should be done to understand how policies and procedures produce disparate outcomes. For example, I disaggregated the district by inner areas and found varying degrees of risk, depending on where the school was located. Research into the understanding of differences in procedures within a district, where the process should be centralized, may contribute insight on how social and institutional factors influence the district process.

2. I included a model that excluded ESL and Bilingual enrollment as predictor variables when looking at all five years. Removing these two variables did change the likelihood an EL student would be dually enrolled in special education. With the two programs included, EL students were more than twice at risk of being enrolled in special education, compared to 22 percent less likely when ESL and Bilingual enrollment were removed from the model. Research in understanding these two EL programs could tease out more student and school characteristics that impact the risk of concurrent special education enrollment.

Conclusion

In addition to research on English language learners and equality literature, the results of this study reflect the idea that "…the ultimate challenge for educators and policymakers is to address the underlying problems that produce disproportionality….as well as the referral, assessment, and identification process for special education" (Coutinho and Oswald, 2004, p. 4).

School Campuses

Home campuses are the primary identifiers of students with diverse learning needs. Often, teachers and staff are the first to interpret academic performance and determine if the student is at risk of falling behind in mastering the curriculum. A popular intervention program is called Response to Intervention (RTI). While RTI is often designed at the district level, the campus is responsible for implementation and identification. According to the results, EL students were under-identified as needing academic interventions in special education programs. When identified, EL students were more likely to have a speech or intellectual disability, controlling for school and student characteristics.

McLeskey et al. (2017) argued there is a great need to improve teacher practice. The authors believed training in high-level practices would help promote academic success. The responsibility of identifying best practices, providing training, and accountability fall on school administrators. Within local school contexts, administrators can build policies and procedures which systematically track which students need interventions and track their progress. Further, the administration could provide support in training and mentorship areas to ensure fidelity of the campus expectations. By coordinating between the teachers and administration, the responsibility is shouldered by more than one stakeholder. This allows the teachers to focus more on which teaching practice they will employ and how they will employ the practice and reflect on the results. This collaboration often falls apart as teachers and administration get lost in the daily conflicts and emergencies that arise. Campuses should build partnerships across curriculum teachers and departments to ensure children who may quietly fall behind are not left behind. Campus administrators should provide "…a focused set of practices that…teachers are taught to use effectively" (McLeskey et al., 2017, p. 9). By providing one or two strategies a year and providing fidelity oversight, the administration can help grow teachers who better identify early academic performance issues or identify issues with greater accuracy.

August and Blackburn (2019) suggested adding EL strategies to teacher observations and administration feedback. Again, by sharing the responsibility of learning, implementing best practices for EL students will benefit both the students and, teachers. The intent of using this strategy is to help teachers improve at addressing the diverse needs of their students.

Local Education Agencies

Under Title III of Every Student Succeeds Act (2015), progress in obtaining English language proficiency was once measured at the district, but will now be measured at the campus level. Districts must provide bilingual and English as a second language course work to help EL students acquire the English skills they need to succeed in school. The measurement of students achieving progress in English is a great data tool for districts. However, most schools do not cross EL data with special education data. Districts often only measure what the State Education Agencies measure. In Texas, special education disproportionality is only measured by race, not through language.

This study shows that EL students are underrepresented in special education programming, and some EL students may not be getting the assistance they need to be successful. If the districts only measure what the state and federal government examine, they could easily miss a group of historically underserved students. Districts must take the initiative in identifying groups of students who are not achieving on grade level and seek to provide intervention services. Examples include targeted teaching practices (August & Blackburn, 2019), special language labs (Bal et al., 2019), or even a special education referral following a tiered support and intervention program.

Furthermore, districts hold a responsibility to students, families, the state, and the federal government to provide a timely evaluation process and create systems to monitor special education practices and policies. Even if a district provides an equity audit but does not follow the process set forth by IDEA and their SEA, the district creates a systematic failure in the area of special education. The two strategies must be congruent and implemented with fidelity and authenticity.

State Education Agencies

The TEA, the State Education Agency for Texas, has failed to examine special education disproportionality deeply. For example, TEA only requires race as an indicator for segregated special education enrollments when looking at disproportionality. While the state does collect information on EL students' language process, this group of students is never checked for under- or over-representation within the district. Specifically, they look to see if any racial group is over-represented in high incidence special education programming. To TEA's credit, the state employs a research back audit using risk ratios to determine if one race is more likely to be in special education than a comparison group. However, the risk ratio applied to determine disproportionality is 2.5, which is higher than the accepted 1.0 threshold developed by Chinn & Hughes (1987). Within the racial groups, TEA only examines African Americans, Hispanics, and white students, preventing a uniquely diverse group from being included in the analysis, just like EL students. I believe it would be a valuable tool for Texas to include EL students. Students identified as Limited English Proficient (LEP) and those who have been promoted out of the LEP label account for almost half of the school district in the sample district. Without targeted analyses, Texas could be missing a very large group of students who may be at risk of being disproportionality represented.

The study's goal was to examine the historical problem of disproportionality within special education using a local context. The local school district was chosen not only for the high enrollment levels of EL students but also for the reputation of servicing special education based on TEA’s guidance. In all, I found EL students were under-represented within the district’s special education program, despite having a larger probability of being enrolled when controlling for student and social characteristics. If EL students were enrolled in special education, they were more likely to be enrolled in Speech. Disaggregating for inner district areas, school level, years in U.S. public schools, and home languages, impacted the likelihood of EL students being enrolled in the special education.

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APPENDIX A

District Area Enrollment, 2014 - 2018

District

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	208,100		211,064		211,655		211,472		209,989	
Special	17,724	8.5	17,723	8.4	17,252	8.2	17,078	8.1	16,976	8.1
EL	64,046	30.8	65,315	30.9	66,531	31.4	69,968	33.1	67,888	32.3

Area Academic

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	28,368		29,074		29,059		29,657		29,390	
Special	3,223	11.4	3,263	11.2	3,145	10.8	3,113	10.5	3,107	10.6
EL	6,263	22.1	6,595	22.7	6,642	22.9	7,063	23.8	6,898	23.5

Area East

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	31,224		30,938		30,376		29,700		28,748	
Special	2,489	8.0	2,506	8.1	2,521	8.3	2,515	8.5	2,435	8.5
EL	11,632	37.3	11,494	37.2	11,405	37.5	11,781	39.7	11,135	38.7

Area North

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	26,362		26,915		26,733		26,387		25,905	
Special	2,286	8.7	2,407	8.9	2,313	8.7	2,289	8.7	2,289	8.8
EL	10,630	40.3	10,892	40.5	10,927	40.9	11,377	43.1	11,060	42.7

Area Northwest

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	30,423		30,785		30,844		31,053		31,229	
Special	2,506	8.2	2,485	8.1	2,398	7.8	2,405	7.7	2,409	7.7
EL	5,951	19.6	5,974	19.4	6,004	19.5	6,508	21.0	6,255	20.0

Area South

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	24,932		25,808		25,837		25,836		26,113	
Special	2,121	8.5	2,132	8.3	2,059	8.0	2,037	7.9	2,028	7.8
EL	8,356	33.5	8,360	32.4	8,484	32.8	8,846	34.2	8,505	32.6

Area West

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	65,040		66,003		67,346		67,860		68,548	
Special	4,838	7.4	4,711	7.1	4,626	6.9	4,558	6.7	4,652	6.8
EL	20,913	32.2	21,766	33.0	22,843	33.9	24,247	35.7	24,031	35.1

Area Other

Enrollment	School Year									
	2014		2015		2016		2017		2018	
	n	%	n	%	n	%	n	%	n	%
General	1,751		1,561		1,460		979		56	
Special	261	14.9	219	14.0	190	13.0	161	16.4	56	100.0
EL	301	17.2	234	15.0	226	15.5	146	14.9	*	*

APPENDIX B

Area Academic

Year	Student Group	EL Status	District Enrollment	Special Education Enrollment	Other General Education Enrollment	Other Special Education Enrollment	Composite Index - District	Composite Index - Special Education	EL Risk Index	Other Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	64,046	4,209	59,837	13,515	0.308	0.237	0.066	0.226	0.291
	Non-EL Students	No	15,268	1,235	14,033	16,489	0.073	0.070	0.081	1.175	0.069
	District Total		128,786	12,280	116,506	5,444	0.619	0.693	0.095	0.047	2.041
2014-2015	EL Students	Yes	208,100	17,724			1.000	1.000			
	Non-EL Students	No	65,315	4,061	61,254	13,662	0.309	0.229	0.062	0.223	0.279
	District Total		15,473	1,196	14,277	16,527	0.073	0.067	0.077	1.158	0.067
2015-2016	EL Students	Yes	130,276	12,466	117,810	5,257	0.617	0.703	0.096	0.045	2.144
	Non-EL Students	No	211,064	17,723			1.000	1.000			
	District Total		66,531	4,004	62,656	13,720	0.314	0.232	0.060	0.219	0.275
2016-2017	EL Students	Yes	16,155	1,151	14,989	16,573	0.076	0.067	0.071	1.106	0.064
	Non-EL Students	No	128,969	12,097	117,479	5,627	0.609	0.701	0.094	0.048	1.958
	District Total		211,655	17,252			1.000	1.000			
2017-2018	EL Students	Yes	69,968	4,046	66,405	13,678	0.331	0.237	0.058	0.206	0.281
	Non-EL Students	No	16,208	1,168	15,352	16,556	0.077	0.068	0.072	1.078	0.067
	District Total		125,296	11,864	114,375	5,860	0.592	0.695	0.095	0.051	1.848

Area East

Year	Student Group	EL Status	General Enrollment	Sped Enrollment	Other General Enrollment	Other Sped Enrollment	EL Composite	EL Special Education Composite	Group Risk Index	Other Group Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	11,632	845	10,787	1,644	0.373	0.339	0.073	0.152	0.477
	Non-EL Students	No	19,592	1,644	17,948	845	0.627	0.661	0.084	0.047	1.782
	District Total		31,224	2,489							
2014-2015	EL Students	Yes	11,494	794	10,700	1,712	0.372	0.317	0.069	0.160	0.432
	Non-EL Students	No	19,444	1,712	17,732	794	0.628	0.683	0.088	0.045	1.966
	District Total		30,938	2,506							
2015-2016	EL Students	Yes	11,405	794	10,611	1,727	0.375	0.315	0.070	0.163	0.428
	Non-EL Students	No	18,971	1,727	17,244	794	0.625	0.685	0.091	0.046	1.977
	District Total		30,376	2,521							
2016-2017	EL Students	Yes	11,781	789	10,992	1,726	0.397	0.314	0.067	0.157	0.427
	Non-EL Students	No	17,919	1,726	16,193	789	0.603	0.686	0.096	0.049	1.977
	District Total		29,700	2,515							
2017-2018	EL Students	Yes	11,135	787	10,348	1,648	0.393	0.323	0.071	0.159	0.444
	Non-EL Students	No	17,613	1,648	15,965	787	0.621	0.677	0.094	0.049	1.898
	District Total		28,748	2,435							

Area North

Year	Student Group	EL Status	General Enrollment	Sped Enrollment	Other General Enrollment	Other Sped Enrollment	EL Composite	EL Special Education Composite	Group Risk Index	Other Group Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	10,630	616	10,014	1,670	0.403	0.269	0.058	0.167	0.347
	Non-EL Students	No	15,732	1,670	14,062	616	0.597	0.731	0.106	0.044	2.423
	District Total		26,362	2,286							
2014-2015	EL Students	Yes	10,892	543	10,349	1,942	0.405	0.219	0.050	0.188	0.266
	Non-EL Students	No	16,023	1,942	14,081	543	0.595	0.781	0.121	0.039	3.143
	District Total		26,915	2,485							
2015-2016	EL Students	Yes	10,927	613	10,314	1,700	0.409	0.265	0.056	0.165	0.340
	Non-EL Students	No	15,806	1,700	14,106	613	0.591	0.735	0.108	0.043	2.475
	District Total		26,733	2,313							
2016-2017	EL Students	Yes	11,377	635	10,742	1,654	0.431	0.277	0.056	0.154	0.362
	Non-EL Students	No	15,010	1,654	13,356	635	0.569	0.723	0.110	0.048	2.318
	District Total		26,387	2,289							
2017-2018	EL Students	Yes	11,060	635	10,425	1,654	0.390	0.277	0.057	0.159	0.362
	Non-EL Students	No	14,845	1,654	13,191	635	0.523	0.723	0.111	0.048	2.315
	District Total		25,905	2,289							

Area Northwest

Year	Student Group	EL Status	General Enrollment	Sped Enrollment	Other General Enrollment	Other Sped Enrollment	EL Composite	EL Special Education Composite	Group Risk Index	Other Group Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	5,951	535	5,416	1,971	0.196	0.213	0.090	0.364	0.247
	Non-EL Students	No	24,472	1,971	22,501	535	0.804	0.787	0.081	0.024	3.387
	District Total		30,423	2,506							
2014-2015	EL Students	Yes	5,974	543	5,431	1,942	0.194	0.219	0.091	0.358	0.254
	Non-EL Students	No	24,791	1,942	22,849	543	0.806	0.781	0.078	0.024	3.296
	District Total		30,765	2,485							
2015-2016	EL Students	Yes	6,004	535	5,469	1,863	0.195	0.223	0.089	0.341	0.262
	Non-EL Students	No	24,840	1,863	22,977	535	0.805	0.777	0.075	0.023	3.221
	District Total		30,844	2,398							
2016-2017	EL Students	Yes	6,004	535	5,469	1,863	0.195	0.223	0.089	0.341	0.262
	Non-EL Students	No	24,840	1,863	22,977	535	0.805	0.777	0.075	0.023	3.221
	District Total		30,844	2,398							
2017-2018	EL Students	Yes	6,255	514	5,741	1,895	0.220	0.213	0.082	0.330	0.249
	Non-EL Students	No	24,974	1,895	23,079	514	0.880	0.787	0.076	0.022	3.407
	District Total		31,229	2,409							

Area South

Year	Student Group	EL Status	General Enrollment	Sped Enrollment	Other General Enrollment	Other Sped Enrollment	EL Composite	EL Special Education Composite	Group Risk Index	Other Group Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	Yes	8,356	463	7,893	1,658	0.335	0.218	0.055	0.210
	Non-EL Students	No	No	16,576	1,658	14,918	463	0.665	0.782	0.100	0.031
	District Total			24,932	2,121						
2014-2015	EL Students	Yes	Yes	8,360	421	7,939	1,711	0.324	0.197	0.050	0.216
	Non-EL Students	No	No	17,448	1,711	15,737	421	0.676	0.803	0.098	0.027
	District Total			25,808	2,132						
2015-2016	EL Students	Yes	Yes	8,484	421	8,063	1,638	0.328	0.204	0.050	0.203
	Non-EL Students	No	No	17,353	1,638	15,715	421	0.672	0.796	0.094	0.027
	District Total			25,837	2,059			0.911			
2016-2017	EL Students	Yes	Yes	8,484	421	8,063	1,638	0.328	0.204	0.050	0.203
	Non-EL Students	No	No	17,353	1,638	15,715	421	0.672	0.796	0.094	0.027
	District Total			25,837	2,059						
2017-2018	EL Students	Yes	Yes	8,505	417	8,088	1,611	0.300	0.206	0.049	0.199
	Non-EL Students	No	No	17,608	1,611	15,997	417	0.621	0.794	0.091	0.026
	District Total			26,113	2,028						

Area West

Year	Student Group	EL Status	General Enrollment	Sped Enrollment	Other General Enrollment	Other Sped Enrollment	EL Composite	EL Special Education Composite	Group Risk Index	Other Group Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	Yes	21,766	1,140	20,626	3,571	0.330	0.242	0.052	0.173
	Non-EL Students	No	No	44,237	3,571	40,666	1,140	0.670	0.758	0.081	0.028
	District Total			66,003	4,711						
2014-2015	EL Students	Yes	Yes	21,766	1,140	20,626	3,571	0.330	0.242	0.052	0.173
	Non-EL Students	No	No	44,237	3,571	40,666	1,140	0.670	0.758	0.081	0.028
	District Total			66,003	4,711						
2015-2016	EL Students	Yes	Yes	22,843	1,139	21,704	3,487	0.339	0.246	0.050	0.161
	Non-EL Students	No	No	44,503	3,487	41,016	1,139	0.661	0.754	0.078	0.028
	District Total			67,346	4,626			2.374			
2016-2017	EL Students	Yes	Yes	22,843	1,139	21,704	3,487	0.339	0.246	0.050	0.161
	Non-EL Students	No	No	44,503	3,487	41,016	1,139	0.661	0.754	0.078	0.028
	District Total			67,346	4,626						
2017-2018	EL Students	Yes	Yes	24,031	1,209	22,822	3,443	0.351	0.260	0.050	0.151
	Non-EL Students	No	No	44,517	3,443	41,074	1,209	0.649	0.740	0.077	0.029
	District Total			68,548	4,652						

Area Other

Year	Student Group	EL Status	General Enrollment	Sped Enrollment	Other General Enrollment	Other Sped Enrollment	EL Composite	EL Special Education Composite	Group Risk Index	Other Group Risk Index	Relative Risk of EL compared to Non-EL
2013-2014	EL Students	Yes	Yes	Yes	301	31	270	230	0.172	0.119	0.103
	Non-EL Students	No	No	No	1,450	230	1,220	31	0.828	0.881	0.159
	District Total				1,751	261					
2014-2015	EL Students	Yes	Yes	Yes	233	21	212	176	0.156	0.107	0.090
	Non-EL Students	No	No	No	1,263	176	1,087	21	0.844	0.893	0.139
	District Total				1,496	197					
2015-2016	EL Students	Yes	Yes	Yes	226	19	207	140	0.159	0.119	0.084
	Non-EL Students	No	No	No	1,198	139	1,059	20	0.841	0.874	0.116
	District Total				1,424	159	1,265				
2016-2017	EL Students	Yes	Yes	Yes	226	19	207	171	0.155	0.100	0.084
	Non-EL Students	No	No	No	1,234	171	1,063	19	0.845	0.900	0.139
	District Total				1,460	190	1,270				
2017-2018	EL Students	Yes	Yes	Yes	*	*	*	*	*	*	*
	Non-EL Students	No	No	No	52	52	-	*	*	*	*
	District Total			Yes	301	31	270	230	0.172	0.119	0.103

APPENDIX C

Research Question #2 and #3 Predictor Variables

Predictor Variables	Type of Variable
EL	Dichotomous
Bilingual	Dichotomous
ESL	Dichotomous
Economically Disadvantaged	Dichotomous
Immigrant	Dichotomous
Migrant	Dichotomous
Gender	Dichotomous
% of Hispanic Teachers	Continuous
% of White Teachers	Continuous
Previous Year Special Education %	Continuous
Campus Distance from City Center	Continuous
Attendance Rate for the Year	Continuous
Federal Ethnicity	Categorical
HISD Area	Categorical
Home. Language	Categorical
School Level	Categorical
Number of Years in U.S. Schools	Categorical

APPENDIX D

Multinomial Logistic Summary Tables 2014-2018

2013-2014

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Not Disabled (Base Outcome)							
Emotionally Disturbed	Intercept	1.49	4.45	0.40	3.72	0.00	**
	EL Status	0.35	0.35	0.44	0.79	0.42	
	Bilingual Status	-1.33	0.27	0.18	-7.53	0.00	**
	ESL Status	0.18	1.19	0.16	1.11	0.27	
	Economically Disadv.	0.04	1.04	0.07	0.56	0.54	
	Migrant Status	0.40	1.48	0.73	0.54	0.59	
	Immigrant Status	0.76	2.13	.029	2.57	0.01	*
	Gender (F)	-0.59	0.56	0.05	-11.61	0.00	**
	% of Hispanic Tchrs	-0.00	0.10	0.00	-1.75	0.08	
	% of White Tchrs	-0.02	0.10	0.00	-7.58	0.00	**
	Distance from City	0.02	1.02	0.00	2.21	0.03	*
	Attendance Rate (%)	-1.22	0.30	0.20	-5.99	0.00	**
	Federal Race						
	Asian/HPI	-0.31	0.74	0.31	-0.99	0.32	
	African American	0.71	2.03	0.12	5.88	0.00	**
	Hispanic	0.32	1.38	0.13	2.58	0.01	**
	Multiple Races	0.11	1.12	0.32	0.35	0.72	
	Other/Unknown	0.05	0.74	0.78	0.06	0.95	
	District Areas						
	Area East	-0.34	0.71	0.10	-3.42	0.00	**
	Area North	-0.18	0.84	0.10	-1.78	0.075	
	Area Northwest	-0.69	0.50	0.11	-6.49	0.00	**
	Area South	-0.31	0.73	0.09	-3.54	0.00	**
	Area West	-0.62	0.54	0.10	-6.34	0.00	**
	Area Other	-0.67	0.51	0.26	-2.62	0.01	**
	Home Language						
	Spanish	0.66	1.93	0.08	8.23	0.00	**
	Arabic	0.89	2.44	0.40	2.24	.03	*
	Vietnamese	1.03	2.80	0.44	2.36	.02	*

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Emotionally Disturbed (cont.)	Home Language (cont.)						
	Other	0.51	1.67	0.23	2.23	.03	*
	Unknown	0.09	1.10	0.22	0.43	.67	
	School Level						
	Middle School	0.22	1.25	0.08	2.85	.04	**
	High School	0.25	1.27	0.08	3.18	.00	**
	Combination	-0.05	0.96	0.12	-0.39	.70	
	Years in U.S. Schools						
	2	-14.93	0.00	3,325.69	-0.00	0.10	
	3	0.4	1.49	0.29	1.39	0.16	
	4	0.45	1.57	0.27	1.65	0.10	
	5	0.66	1.94	0.28	2.39	0.02	*
	6	0.47	1.60	0.28	1.67	0.10	
	7	-0.24	0.79	0.27	-0.88	0.38	
	N/A (Started in U.S.)	-0.78	0.46	0.31	-2.54	0.01	*

2014-2015

Intellectually Disabled	Intercept	0.07	1.07	0.67	0.10	.92	
	EL Status	0.35	1.42	0.44	0.79	0.43	
	Bilingual Status	-0.76	0.47	0.29	-2.60	0.01	**
	ESL Status	-1.08	0.34	0.31	-3.51	0.00	**
	Economically Disadv.	0.23	1.26	0.11	2.16	0.03	*
	Migrant Status	-14.84	0.00	2,933.09	-0.01	0.10	
	Immigrant Status	0.68	1.98	0.62	1.09	0.28	
	Gender (F)	0.53	1.70	0.1	5.30	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	0.99	0.32	
	% of White Tchrs	-0.01	0.99	0.00	-3.88	0.00	**
	Distance from City	0.02	1.02	0.01	1.18	0.24	
	Attendance Rate (%)	-2.03	0.13	0.26	-7.78	0.00	**
	Federal Race						
	Asian/HPI	-3.27	0.04	1.26	-2.60	0.01	*
	African American	0.11	1.12	0.15	0.77	0.44	
	Hispanic	-0.57	0.57	0.16	-3.61	0.00	*
	Multiple Races	-0.06	0.94	0.37	-0.15	0.88	
	Other/Unknown	-0.37	0.69	1.07	-0.35	0.73	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Intellectually Disabled (cont.)	District Areas						
	Area East	-0.38	0.68	0.17	-2.27	0.02	
	Area North	-0.03	0.97	0.15	-0.23	0.82	
	Area Northwest	-0.59	.57	.17	-3.44	.00	**
	Area South	0.93	.54	.22	4.20	0.00	**
	Area West	-0.62	.49	.15	-4.24	0.00	**
	Area Other	-0.72	2.52	.16	-4.62	0.00	**
	Home Language						
	Spanish	-1.19	.30	.19	-6.44	0.00	**
	Arabic	-15.91	0.00	1,509.26	-0.01	.99	
	Vietnamese	0.96	2.62	1.29	0.74	.46	
	Other	-0.63	.54	.49	-1.28	.20	
	Unknown	0.70	2.02	.21	3.32	.00	**
	School Level						
	Middle School	0.28	1.33	.12	2.35	.02	*
	High School	0.11	1.12	.13	0.89	.38	
	Combination	0.36	1.44	.16	2.24	.03	*
	Years in U.S. Schools						
	2	-14.24	0.00	5,822.03	-0.00	.1	
	3	0.06	1.07	.53	0.12	.91	
	4	0.17	1.19	.50	0.34	.73	
	5	0.21	1.23	.52	0.40	.69	
	6	0.28	1.33	.54	0.53	.6	
	7	0.62	1.86	.48	1.30	.19	
	N/A (Started in U.S.)	-0.89	.41	.56	-1.59	.11	
Specific Learning Disabled	Intercept	-0.90	.41	.32	-2.80	.01	**
	EL Status	-0.66	.52	.15	-4.29	0.00	**
	Bilingual Status	-0.13	.88	.10	-1.32	.19	
	ESL Status	-0.10	.91	.10	-0.97	.33	
	Economically Disadv.	0.23	1.25	.05	4.90	0.00	**
	Migrant Status	0.60	1.06	.56	0.11	.92	
	Immigrant Status	0.02	1.02	.30	0.05	.96	
	Gender (F)	-0.40	.67	.04	-11.27	0.00	**
	% of Hispanic Tchrs	-0.00	1.00	.00	-0.72	.47	
	% of White Tchrs	-0.00	.99	.00	-6.00	0.00	**
	Distance from City	0.02	1.02	.00	3.11	.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Specific Learning Disabled (cont.)	Attendance Rate (%)	0.00	1.00	.20	0.02	.98	
	Federal Race						
	Asian/HPI	0.06	1.06	.22	0.27	.79	
	African American	1.25	3.47	0.08	15.22	0.00	**
	Hispanic	1.15	3.15	0.08	13.99	0.00	**
	Multiple Races	-0.26	0.77	0.26	-1.00	0.32	
	Other/Unknown	1.4	4.04	0.41	3.38	0.00	**
	District Areas						
	Area East	-0.24	0.79	0.07	-3.46	0.00	**
	Area North	0.01	1.01	0.07	0.13	0.90	
	Area Northwest	-0.17	0.84	0.07	-2.48	0.01	*
	Area South	-0.32	0.73	0.07	-4.82	0.00	**
	Area West	-0.44	0.64	0.07	-6.56	0.00	**
	Area Other	0.20	1.22	0.15	1.29	0.20	
	Home Language						
	Spanish	-0.35	0.71	0.05	-6.53	0.00	**
	Arabic	0.31	1.37	0.34	0.92	0.36	
	Vietnamese	-0.04	0.96	0.35	-0.13	0..90	
	Other	-0.71	0.49	0.21	-3.45	0.00	**
	Unknown	0.06	1.06	0.15	0.41	0.68	
	School Level						
	Middle School	0.81	2.24	0.05	15.25	0.00	**
	High School	0.70	2.01	0.05	12.85	0.00	**
	Combination	0.92	1.34	0.08	3.88	0.00	**
	Years in U.S. Schools						
	2	2.1	8.14	1.04	2.01	0.04	*
	3	0.83	2.29	0.24	3.45	0.00	**
	4	1.60	4.93	0.22	7.23	0.00	**
	5	2.09	8.05	0.22	9.49	0.00	**
	6	2.35	10.52	0.22	10.59	0.00	**
	7	2.02	7.53	0.22	9.21	0.00	**
	N/A (Started in U.S.)	0.15	1.17	0.24	0.64	0.52	
Speech Impairment	Intercept	.74	2.11	0.27	2.77	0.01	**
	EL Status	1.34	3.81	0.14	9.66	0.00	**
	Bilingual Status	0.93	2.54	0.11	8.36	0.00	**
	ESL Status	0.26	1.30	0.16	1.64	0.10	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	Economically Disadv.	0.10	1.11	0.09	1.20	0.23	
	Migrant Status	0.55	1.73	0.91	0.60	0.55	
	Immigrant Status	0.10	1.10	0.26	0.38	0.70	
	Gender (F)	0.08	1.08	0.05	1.41	0.16	
	% of Hispanic Tchrs	0.01	1.01	0.00	3.14	0.00	**
	% of White Tchrs	0.01	1.01	0.00	4.74	0.00	**
	Distance from City	0.01	1.01	0.01	0.62	0.54	
	Attendance Rate (%)	-2.55	0.08	0.17	-15.43	0.00	**
	Federal Race						
	Asian/HPI	0.17	1.18	0.20	0.81	0.42	
	African American	-0.24	0.79	0.10	-2.39	0.02	*
	Hispanic	-0.08	0.92	0.09	-0.86	0.39	
	Multiple Races	-0.29	0.75	0.24	-1.20	0.23	
	Other/Unknown	0.20	1.22	0.61	0.33	0.74	
	District Areas						
	Area East	-0.29	0.75	0.12	-2.49	0.01	*
	Area North	0.07	1.07	0.11	0.64	0.52	
	Area Northwest	-0.35	0.71	0.12	-3.00	0.00	**
	Area South	-0.18	0.83	0.11	-1.69	0.09	
	Area West	-0.46	0.63	0.10	-4.41	0.00	**
	Area Other	-1.23	0.29	0.44	-2.82	0.01	**
	Home Language						
	Spanish	-0.59	0.55	0.09	-6.33	0.00	**
	Arabic	-0.30	0.74	0.39	-0.78	0.44	
	Vietnamese	-1.16	0.31	0.47	-2.45	0.01	*
	Other	-0.32	0.73	0.22	-1.41	0.16	
	Unknown	-0.10	0.91	0.20	-0.49	0.63	
	School Level						
	Middle School	-1.81	0.16	0.11	-15.97	0.00	**
	High School	-3.19	0.04	0.17	-18.72	0.00	**
	Combination	-0.63	0.54	0.10	-6.10	0.00	**
	Years in U.S. Schools						
	2	0.29	1.34	1.05	0.28	0.78	
	3	-0.19	0.82	0.15	-1.29	0.20	
	4	-0.79	0.46	0.16	-4.89	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	5	-1.25	0.29	0.19	-6.67	0.00	**
	6	-1.10	0.33	0.20	-5.42	0.00	**
	7	-0.87	0.42	0.23	-3.78	0.00	**
	N/A (Started in U.S.)	0.59	1.80	0.13	4.47	0.00	**

Mean dependent var	1.66	SD dependent var	1.57
Pseudo r-squared	0.13	Number of obs	22,200
Chi-square	7,886.41	Prob > chi2	0.00
Akaike crit. (AIC)	51,355.20	Bayesian crit. (BIC)	52,572.39

*** p<.01, * p<.05*

2014-2015

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Not Disabled (Base Outcome)							
Emotionally Disturbed	Intercept	-1.68	0.70	0.39	-4.36	0.00	**
	EL Status	-0.35	0.21	0.21	-1.70	0.09	
	Bilingual Status	-1.55	0.86	0.17	-9.06	0.00	**
	ESL Status	-0.16	0.90	0.15	-1.04	0.30	
	Economically Disadv.	-0.10	1.98	0.07	-1.54	0.12	
	Migrant Status	0.68	2.78	0.65	1.05	0.29	
	Immigrant Status	1.02	1.80	0.24	4.34	0.00	**
	Gender (F)	0.59	1.00	0.05	11.75	0.00	**
	% of Hispanic Tchrs	0.00	0.99	0.00	-0.24	0.81	
	% of White Tchrs	-0.02	1.04	0.00	-7.37	0.00	**
	Distance from City	0.04	0.41	0.01	4.42	0.00	**
	Attendance Rate (%)	-0.89	504.09	0.20	-4.53	0.00	**
	Prior Campus Sped %	6.22	0.70	0.58	10.68	0.00	**
	Federal Race						
	Asian/HPI	0.61	1.85	0.12	5.12	0.00	**
	African American	0.20	1.22	0.79	0.25	0.80	
	Hispanic	-0.07	0.93	0.29	-0.25	0.80	
	Multiple Races	0.18	1.20	0.13	1.46	0.15	
	Other/Unknown	0.22	1.24	0.31	0.69	0.49	
	District Areas						
	Area East	-0.10	0.90	0.10	-1.03	0.30	
	Area North	-0.13	0.88	0.10	-1.36	0.18	
	Area Northwest	-0.49	0.61	0.11	-4.59	0.00	**
	Area South	-0.17	0.84	0.09	-1.99	0.05	*
	Area West	-0.43	0.65	0.10	-4.48	0.00	**
	Area Other	-3.73	0.02	0.52	-7.13	0.00	**
	Home Language						
	Spanish	0.73	2.07	0.08	9.15	0.00	**
	Arabic	0.59	1.81	0.41	1.46	0.14	
	Vietnamese	1.10	2.99	0.44	2.49	0.01	*
	Other	0.26	1.30	0.16	1.61	0.11	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Emotionally Disturbed (cont.)	School Level						
	Middle School	0.02	1.02	0.08	0.28	0.78	
	High School	0.11	1.12	0.08	1.40	0.16	
	Combination	-0.22	0.81	0.12	-1.81	0.07	
	Years in U.S. Schools						
	2	2.75	15.63	1.32	2.08	0.04	*
	3	0.61	1.83	0.28	2.15	0.03	*
	4	0.67	1.95	0.28	2.42	0.02	*
	5	0.61	1.85	0.28	2.22	0.03	*
	6	0.53	1.70	0.29	1.84	0.07	
	7	0.10	1.11	0.27	0.38	0.70	
	N/A (Started in U.S.)	0.11	1.11	0.29	0.37	0.71	
Intellectually Disabled	Intercept	0.14	1.15	0.67	0.20	0.84	**
	EL Status	0.31	1.36	0.51	0.60	0.55	**
	Bilingual Status	-1.04	0.35	0.29	-3.60	0.00	
	ESL Status	-1.05	0.35	0.29	-3.61	0.00	
	Economically Disadv.	0.21	1.24	0.10	2.10	0.04	**
	Migrant Status	1.34	3.82	0.87	1.54	0.12	
	Immigrant Status	0.30	1.35	0.54	0.55	0.59	
	Gender (F)	-0.44	0.65	0.10	-4.61	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.89	0.37	
	% of White Tchrs	0.00	1.00	0.00	-1.34	0.18	**
	Distance from City	0.05	1.05	0.01	3.72	0.00	**
	Attendance Rate (%)	-1.84	0.16	0.25	-7.41	0.00	**
	Prior Campus Sped %	4.53	92.59	0.53	8.48	0.00	**
	Federal Race						
	Asian/HPI	0.28	1.32	0.15	1.84	0.07	**
	African American	0.12	1.13	1.06	0.11	0.91	**
	Hispanic	-3.33	0.04	1.21	-2.75	0.01	
	Multiple Races	-0.21	0.81	0.16	-1.33	0.19	**
	Other/Unknown	0.36	1.44	0.35	1.03	0.30	
	District Areas						
	Area East	0.02	1.02	0.16	0.14	0.89	*
	Area North	0.01	1.01	0.14	0.07	0.94	
	Area Northwest	-0.51	0.60	0.17	-3.07	0.00	*

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Intellectually Disabled (cont.)	District Areas (cont.)						
	Area South	-0.40	0.67	0.14	-2.89	0.00	**
	Area West	-0.91	0.40	0.15	-6.10	0.00	**
	Area Other	-1.85	0.16	0.43	-4.29	0.00	
	Home Language						
	Spanish	-1.27	0.28	-1.27	-1.27	-1.27	**
	Arabic	-1.13	0.32	-1.13	-1.13	-1.13	
	Vietnamese	1.32	3.75	1.32	1.32	1.32	
	Other	0.32	1.37	0.32	0.32	0.32	
	School Level						
	Middle School	0.17	1.19	0.11	1.49	0.14	**
	High School	-0.18	0.84	0.12	-1.47	0.14	**
	Combination	0.07	1.07	0.18	0.38	0.70	**
	Years in U.S. Schools						
	2	-10.15	0.00	1.45	1.25	0.21	
	3	0.15	1.16	0.24	4.86	0.00	**
	4	-0.15	0.86	0.23	6.97	0.00	**
	5	0.55	1.74	0.22	9.27	0.00	**
	6	0.33	1.39	0.23	10.99	0.00	**
	7	0.25	1.28	0.22	9.90	0.00	**
	N/A (Started in U.S.)	-1.01	0.37	0.26	-0.31	0.76	
Specific Learning Disabled	Intercept	-2.27	0.10	0.33	-6.86	0.00	**
	EL Status	-1.04	0.35	0.18	-5.67	0.00	**
	Bilingual Status	-0.13	0.88	0.10	-1.34	0.18	
	ESL Status	-0.11	0.89	0.10	-1.12	0.26	
	Economically Disadv.	0.27	1.31	0.04	6.23	0.00	**
	Migrant Status	0.04	1.04	0.55	0.06	0.95	
	Immigrant Status	-0.41	0.67	0.30	-1.37	0.17	
	Gender (F)	0.40	1.50	0.04	11.56	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.79	0.43	
	% of White Tchrs	-0.01	0.99	0.00	-5.66	0.00	**
	Distance from City	0.02	1.02	0.01	3.26	0.00	**
	Attendance Rate (%)	0.57	1.77	0.18	3.21	0.00	**
	Prior Campus Sped %	0.89	2.44	0.31	2.91	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Specific Learning Disabled (cont.)	Federal Race						
	Asian/HPI	1.26	3.52	0.08	14.93	0.00	**
	African American	1.78	5.93	0.42	4.24	0.00	**
	Hispanic	-0.03	0.97	0.22	-0.15	0.88	
	Multiple Races	1.21	3.37	0.08	14.41	0.00	**
	Other/Unknown	0.12	1.13	0.24	0.50	0.62	
	District Areas						
	Area East	-0.15	0.86	0.07	-2.18	0.03	*
	Area North	0.00	1.00	0.07	-0.01	0.99	
	Area Northwest	-0.15	0.86	0.07	-2.19	0.03	*
	Area South	-0.20	0.82	0.07	-3.05	0.00	**
	Area West	-0.42	0.66	0.07	-6.38	0.00	**
	Area Other	-0.14	0.87	0.16	-0.92	0.36	
	Home Language						
	Spanish	-0.39	0.68	0.05	-7.32	0.00	**
	Arabic	0.20	1.22	0.36	0.56	0.58	
	Vietnamese	0.15	1.16	0.38	0.38	0.71	
	Other	-0.18	0.84	0.13	-1.35	0.18	
	School Level						
	Middle School	0.81	2.25	0.05	15.47	0.00	**
	High School	0.74	2.10	0.05	13.81	0.00	**
	Combination	0.25	1.28	0.08	3.27	0.00	**
	Years in U.S. Schools						
	2	1.81	6.10	1.45	1.25	0.21	
	3	1.15	3.16	0.24	4.86	0.00	**
	4	1.57	4.83	0.23	6.97	0.00	**
	5	2.06	7.83	0.22	9.27	0.00	**
	6	2.48	11.97	0.23	10.99	0.00	**
	7	2.19	8.90	0.22	9.90	0.00	**
	N/A (Started in U.S.)	-0.08	0.92	0.26	-0.31	0.76	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment	Intercept	0.72	2.06	0.27	2.73	0.01	**
	EL Status	1.55	4.72	0.15	10.71	0.00	**
	Bilingual Status	0.73	2.07	0.11	6.57	0.00	**
	ESL Status	0.15	1.17	0.15	1.03	0.30	
	Economically Disadv.	0.01	1.01	0.08	0.14	0.89	
	Migrant Status	0.24	1.27	0.92	0.26	0.80	
	Immigrant Status	-0.37	0.69	0.25	-1.48	0.14	
	Gender (F)	-0.08	0.92	0.05	-1.48	0.14	
	% of Hispanic Tchrs	0.00	1.00	0.00	1.80	0.07	
	% of White Tchrs	0.01	1.01	0.00	2.91	0.00	**
	Distance from City	0.01	1.01	0.01	1.53	0.13	
	Attendance Rate (%)	-2.27	0.10	0.16	-14.34	0.00	**
	Prior Campus Sped %	-2.15	0.12	0.89	-2.41	0.02	*
	Federal Race						
	Asian/HPI	-0.23	0.80	0.10	-2.24	0.03	*
	African American	0.09	1.09	0.65	0.14	0.89	
	Hispanic	0.19	1.21	0.19	1.02	0.31	
	Multiple Races	-0.06	0.94	0.10	-0.62	0.54	
	Other\Unknown	-0.22	0.80	0.25	-0.89	0.37	
	District Areas						
	Area East	0.05	1.05	0.11	0.43	0.66	
	Area North	0.17	1.19	0.11	1.61	0.11	
	Area Northwest	-0.04	0.96	0.12	-0.34	0.73	
	Area South	-0.13	0.05	0.11	-1.20	0.23	
	Area West	-0.22	0.88	0.10	-2.17	0.03	*
	Area Other	-2.97	0.80	0.62	-4.79	0.00	**
	Home Language						
	Spanish	-0.72	0.49	0.10	-7.36	0.00	**
	Arabic	0.19	1.21	0.34	0.56	0.57	
	Vietnamese	-0.42	0.66	0.43	-0.96	0.34	
	Other	-0.48	0.62	0.17	-2.93	0.00	**
	Unknown	-0.72	0.49	0.10	-7.36	0.00	**
	School Level						
	Middle School	-1.71	0.18	0.11	-15.01	0.00	**
	High School	-2.75	0.06	0.15	-18.44	0.00	**
	Combination	-0.71	0.49	0.11	-6.70	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	Years in U.S. Schools						
	2	0.26	1.30	1.45	0.18	0.86	
	3	-0.30	0.74	0.15	-2.09	0.04	*
	4	-1.03	0.36	0.16	-6.47	0.00	**
	5	-1.25	0.29	0.18	-7.18	0.00	**
	6	-1.61	0.20	0.23	-7.02	0.00	**
	7	-0.95	0.39	0.22	-4.27	0.00	**
	N/A (Started in U.S.)	.	.	.	.	.	

Mean dependent var	1.60	SD dependent var	1.56
Pseudo r-squared	0.13	Number of obs	22,464
Chi-square	7,783.61	Prob > chi2	0.00
Akaike crit. (AIC)	51,903.12	Bayesian crit. (BIC)	53,122.11

*** p<.01, * p<.05*

2015-2016

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Not Disabled (Base Outcome)							
Emotionally Disturbed	Intercept	-1.96	0.14	0.36	-5.51	0.00	**
	EL Status	0.03	1.03	0.18	0.14	0.89	
	Bilingual Status	-1.67	0.19	0.18	-9.48	0.00	**
	ESL Status	-0.37	0.69	0.14	-2.60	0.01	**
	Economically Disadv.	0.02	1.02	0.05	0.37	0.71	
	Migrant Status	1.47	4.33	0.84	1.74	0.08	
	Immigrant Status	1.28	3.58	0.19	6.57	0.00	**
	Gender (F)	0.57	1.77	0.05	11.51	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.16	0.87	
	% of White Tchrs	-0.01	0.99	0.00	-6.79	0.00	**
	Distance from City	0.04	1.04	0.01	4.58	0.00	**
	Attendance Rate (%)	-0.61	0.54	0.19	-3.28	0.00	**
	Prior Campus Sped %	6.92	1,010.54	0.67	10.29	0.00	**
	Federal Race						
	Asian/HPI	0.59	1.81	0.12	4.94	0.00	**
	African American	0.09	1.09	0.78	0.11	0.91	
	Hispanic	-0.19	0.83	0.28	-0.67	0.50	
	Multiple Races	0.17	1.19	0.12	1.39	0.16	
	Other/Unknown	0.02	1.02	0.31	0.07	0.95	
	District Areas						
	Area East	-0.10	0.90	0.10	-1.04	0.30	
	Area North	-0.16	0.85	0.10	-1.66	0.10	
	Area Northwest	-0.46	0.63	0.11	-4.35	0.00	**
	Area South	-3.84	0.02	0.61	-6.34	0.00	**
	Area West	-0.38	0.69	0.09	-3.99	0.00	**
	Area Other	-0.20	0.82	0.09	-2.30	0.02	*
	Home Language						
	Spanish	0.76	2.14	0.08	9.78	0.00	**
	Arabic	0.78	2.18	0.35	2.22	0.03	*
	Vietnamese	1.00	2.70	0.47	2.13	0.03	*
	Other	0.22	1.25	0.16	1.41	0.16	
	Unknown	.	.	.	.	.	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Emotionally Disturbed (cont.)	School Level						
	Middle School	0.10	1.11	0.08	1.31	0.19	
	High School	0.19	1.21	0.08	2.38	0.02	*
	Combination	-0.10	0.90	0.12	-0.84	0.40	
	Years in U.S. Schools						
	2	-0.29	0.75	0.27	-1.07	0.28	
	3	-0.26	0.77	0.26	-1.00	0.32	
	4	-0.02	0.98	0.26	-0.09	0.93	
	5	-0.17	0.85	0.26	-0.64	0.52	
	6	-0.42	0.66	0.24	-1.75	0.08	
	N/A (Started in U.S.)	-0.06	0.94	0.25	-0.25	0.80	
Intellectually Disabled	Intercept	-0.70	0.50	0.78	-0.89	0.37	
	EL Status	0.48	1.61	0.46	1.03	0.30	
	Bilingual Status	-1.57	0.21	0.34	-4.67	0.00	**
	ESL Status	-0.80	0.45	0.26	-3.04	0.00	**
	Economically Disadv.	0.27	1.32	0.08	3.35	0.00	**
	Migrant Status	1.98	7.23	1.18	1.68	0.09	
	Immigrant Status	-0.70	0.50	0.74	-0.95	0.34	
	Gender (F)	-0.37	0.69	0.09	-3.99	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.53	0.59	
	% of White Tchrs	-0.01	1.00	0.00	-1.66	0.10	
	Distance from City	0.05	1.05	0.01	3.40	0.00	**
	Attendance Rate (%)	-1.85	0.16	0.24	-7.76	0.00	**
	Prior Campus Sped %	3.69	40.06	0.55	6.67	0.00	**
	Federal Race						
	Asian/HPI	0.12	1.13	0.15	0.83	0.41	
	African American	-0.14	0.87	1.06	-0.13	0.90	
	Hispanic	-1.62	0.20	0.59	-2.75	0.01	**
	Multiple Races	-0.59	0.56	0.16	-3.69	0.00	**
	Other/Unknown	-0.12	0.89	0.37	-0.31	0.76	
	District Areas						
	Area East	0.05	1.05	0.15	0.30	0.76	
	Area North	-0.14	0.87	0.14	-0.98	0.33	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Intellectually Disabled	District Areas (cont.)						
	Area Northwest	-0.61	0.54	0.16	-3.71	0.00	**
	Area South	-1.21	0.30	0.40	-3.05	0.00	**
	Area West	-1.00	0.37	0.15	-6.88	0.00	**
	Area Other	-0.72	0.49	0.14	-5.05	0.00	**
	Home Language						
	Spanish	-1.03	0.36	0.18	-5.75	0.00	**
	Arabic	-1.29	0.28	1.03	-1.25	0.21	
	Vietnamese	0.04	1.04	1.16	0.03	0.97	
	Other	0.25	1.28	0.20	1.22	0.22	
	Unknown	-1.03	0.36	0.18	-5.75	0.00	**
	School Level						
	Middle School	0.05	1.06	0.12	0.45	0.65	
	High School	-0.11	0.90	0.12	-0.92	0.36	
	Combination	0.42	1.52	0.16	2.57	0.01	*
	Years in U.S. Schools						
	2	1.15	3.17	0.66	1.74	0.08	
	3	0.73	2.08	0.68	1.08	0.28	
	4	0.87	2.38	0.68	1.28	0.20	
	5	1.46	4.28	0.65	2.25	0.02	*
	6	0.92	2.50	0.64	1.44	0.15	
	N/A (Started in U.S.)	0.07	1.08	0.71	0.10	0.92	
Specific Learning Disabled	Intercept	-3.17	0.04	0.38	-8.27	0.00	**
	EL Status	-0.78	0.46	0.18	-4.39	0.00	**
	Bilingual Status	-0.21	0.81	0.10	-2.12	0.03	*
	ESL Status	-0.16	0.85	0.10	-1.68	0.09	
	Economically Disadv.	0.37	1.44	0.04	10.45	0.00	**
	Migrant Status	1.69	5.44	0.68	2.51	0.01	*
	Immigrant Status	-0.27	0.76	0.27	-0.99	0.32	
	Gender (F)	0.38	1.46	0.04	10.63	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.82	0.41	
	% of White Tchrs	-0.01	0.99	0.00	-5.10	0.00	**
	Distance from City	0.02	1.02	0.01	2.74	0.01	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Specific Learning Disabled (cont.)	Attendance Rate (%)	0.53	1.70	0.18	2.94	0.00	**
	Prior Campus Sped %	0.91	2.48	0.36	2.54	0.01	*
	Federal Race						
	Asian/HPI	1.10	3.00	0.09	12.49	0.00	**
	African American	1.69	5.44	0.42	4.05	0.00	**
	Hispanic	-0.48	0.62	0.25	-1.92	0.06	
	Multiple Races	1.11	3.03	0.09	12.67	0.00	**
	Other/Unknown	0.17	1.19	0.23	0.74	0.46	
	District Areas						
	Area East	-0.05	0.95	0.07	-0.73	0.47	
	Area North	0.00	1.00	0.07	-0.01	0.99	
	Area Northwest	-0.16	0.86	0.07	-2.28	0.02	*
	Area South	0.03	1.03	0.18	0.15	0.88	
	Area West	-0.39	0.68	0.07	-5.80	0.00	**
	Area Other	-0.28	0.76	0.07	-4.14	0.00	**
	Home Language						
	Spanish	-0.44	0.64	0.06	-8.02	0.00	**
	Arabic	0.16	1.17	0.33	0.48	0.64	
	Vietnamese	0.51	1.66	0.42	1.21	0.23	
	Other	0.17	1.19	0.12	1.41	0.16	
	School Level						
	Middle School	0.92	2.51	0.06	16.62	0.00	**
	High School	1.01	2.76	0.06	18.45	0.00	**
	Combination	0.47	1.60	0.08	5.98	0.00	**
	Years in U.S. Schools						
	2	1.40	4.04	0.31	4.52	0.00	**
	3	1.97	7.16	0.30	6.66	0.00	**
	4	2.40	10.99	0.29	8.19	0.00	**
	5	2.85	17.21	0.29	9.68	0.00	**
	6	2.67	14.47	0.29	9.19	0.00	**
	N/A (Started in U.S.)	0.58	1.78	0.32	1.82	0.07	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment	Intercept	0.53	1.69	0.27	1.94	0.05	
	EL Status	1.26	3.54	0.15	8.68	0.00	**
	Bilingual Status	0.98	2.66	0.11	9.00	0.00	**
	ESL Status	-0.13	0.88	0.15	-0.88	0.38	
	Economically Disadv.	0.15	1.16	0.05	2.93	0.00	**
	Migrant Status	0.75	2.12	0.99	0.76	0.45	
	Immigrant Status	-0.43	0.65	0.22	-1.94	0.05	
	Gender (F)	-0.07	0.93	0.05	-1.35	0.18	
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.29	0.77	
	% of White Tchrs	0.00	1.00	0.00	2.55	0.01	*
	Distance from City	0.01	1.01	0.01	1.40	0.16	
	Attendance Rate (%)	-2.28	0.10	0.15	-15.79	0.00	**
	Prior Campus Sped %	-1.61	0.20	0.95	-1.69	0.09	
	Federal Race						
	Asian/HPI	-0.16	0.85	0.10	-1.52	0.13	
	African American	0.19	1.20	0.65	0.28	0.78	
	Hispanic	0.13	1.14	0.19	0.68	0.50	
	Multiple Races	0.02	1.02	0.10	0.21	0.83	
	Other/Unknown	-0.23	0.79	0.25	-0.94	0.35	
	District Areas						
	Area East	0.17	1.19	0.12	1.47	0.14	
	Area North	0.18	1.19	0.11	1.60	0.11	
	Area Northwest	-0.03	0.97	0.12	-0.26	0.80	
	Area South	-0.09	0.92	0.11	-0.79	0.43	
	Area West	-0.02	0.98	0.10	-0.17	0.87	
	Area Other	-1.17	0.31	0.53	-2.20	0.03	*
	Home Language						
	Spanish	-0.63	0.98	0.10	-6.59	0.00	**
	Arabic	-0.02	1.40	0.35	-0.07	0.95	
	Vietnamese	0.34	0.65	0.43	0.80	0.43	
	Other	-0.43	1.00	0.16	-2.65	0.01	**
	School Level						
	Middle School	-1.76	0.17	0.12	-14.64	0.00	**
	High School	-2.53	0.08	0.14	-18.12	0.00	**
	Combination	-0.67	0.51	0.11	-6.20	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	Years in U.S. Schools						
	2	-0.31	0.74	0.15	-2.11	0.04	*
	3	-0.85	0.43	0.16	-5.46	0.00	**
	4	-1.36	0.26	0.18	-7.64	0.00	**
	5	-1.48	0.23	0.22	-6.63	0.00	**
	6	-0.78	0.46	0.23	-3.38	0.00	**
	N/A (Started in U.S.)	0.46	1.58	0.27	1.94	0.05	

Mean dependent var	1.51	SD dependent var	1.56
Pseudo r-squared	0.13	Number of obs	22,257
Chi-square	7,836.77	Prob > chi2	0.00
Akaike crit. (AIC)	50,954.60	Bayesian crit. (BIC)	52,140.14

** p<.01, * p<.05

2016-2017

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p-value*	Sig.
Not Disabled (Base Outcome)							
Emotionally Disabled	Intercept	-1.23	0.29	0.40	-3.05	0.00	**
	EL Status	-0.30	0.75	0.12	-2.45	0.01	*
	Bilingual Status	-1.12	0.33	0.16	-7.23	0.00	**
	ESL Status	-0.40	0.67	0.14	-2.97	0.00	**
	Economically Disadv.	0.53	1.70	0.08	6.99	0.00	**
	Migrant Status	0.11	1.12	0.83	0.13	0.90	
	Immigrant Status	1.19	3.28	0.18	6.58	0.00	**
	Gender (F)	0.63	1.87	0.05	12.71	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	0.32	0.75	
	% of White Tchrs	-0.01	0.99	0.00	-5.68	0.00	**
	Distance from City	0.06	1.06	0.01	6.26	0.00	**
	Attendance Rate (%)	-1.05	0.35	0.19	-5.41	0.00	**
	Prior Campus Sped %	7.91	2,714.31	0.76	10.47	0.00	**
	Federal Race						
	Asian/HPI	0.62	1.85	0.13	4.92	0.00	**
	African American	-1.13	0.32	1.06	-1.07	0.29	
	Hispanic	-0.18	0.84	0.28	-0.66	0.51	
	Multiple Races	0.14	1.15	0.13	1.09	0.28	
	Other/Unknown	-0.47	0.62	0.37	-1.28	0.20	
	District Areas						
	Area East	-0.12	0.89	0.10	-1.18	0.24	
	Area North	-0.08	0.92	0.10	-0.82	0.41	
	Area Northwest	-0.27	0.76	0.10	-2.58	0.01	*
	Area South	-0.23	0.80	0.09	-2.60	0.01	**
	Area West	-0.19	0.83	0.09	-2.00	0.05	*
	Area Other	-4.33	0.01	0.68	-6.37	0.00	**
	Home Language						
	Spanish	-1.18	0.31	0.31	-3.86	0.00	**
	Arabic	-0.44	0.64	0.35	-1.26	0.21	
	Vietnamese	-0.40	0.67	0.31	-1.28	0.20	
	Other	-0.47	0.62	0.39	-1.23	0.22	
	Unknown	-0.11	0.90	0.54	-0.21	0.84	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p-value*	Sig.
Emotionally Disturbed (cont.)	School Level						
	Middle School	-0.06	0.94	0.08	-0.77	0.44	
	High School	0.19	1.20	0.08	2.41	0.02	*
	Combination	-0.30	0.74	0.12	-2.46	0.01	*
	Years in U.S. Schools						
	2	0.14	1.15	0.16	0.87	0.39	
	3	0.01	1.01	0.17	0.03	0.98	
	4	0.19	1.21	0.17	1.08	0.28	
	5	0.18	1.20	0.19	0.98	0.33	
	6	0.07	1.07	0.16	0.43	0.66	
	N/A (Started in U.S.)	0.02	1.02	0.12	0.16	0.87	
Intellectually Disabled	Intercept	-2.64	0.07	1.11	-2.37	0.02	*
	EL Status	1.06	2.88	0.26	4.02	0.00	**
	Bilingual Status	-1.02	0.36	0.28	-3.61	0.00	**
	ESL Status	-0.35	0.70	0.26	-1.37	0.17	
	Economically Disadv.	0.39	1.47	0.11	3.63	0.00	**
	Migrant Status	-13.27	0.00	1,127.66	-0.01	0.99	
	Immigrant Status	-0.29	0.75	0.61	-0.48	0.63	
	Gender (F)	-0.22	0.80	0.09	-2.60	0.01	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.13	0.90	
	% of White Tchrs	0.00	1.00	0.00	-1.66	0.10	
	Distance from City	0.06	1.06	0.01	4.45	0.00	**
	Attendance Rate (%)	-1.83	0.16	0.25	-7.32	0.00	**
	Prior Campus Sped %	3.31	27.50	0.54	6.15	0.00	**
	Federal Race						
	Asian/HPI	-0.04	0.96	0.14	-0.31	0.75	
	African American	-0.22	0.80	0.77	-0.29	0.78	
	Hispanic	-1.52	0.22	0.61	-2.50	0.01	*
	Multiple Races	-0.69	0.50	0.15	-4.67	0.00	**
	Other/Unknown	0.29	1.33	0.27	1.04	0.30	
	District Areas						
	Area East	-0.14	0.87	0.15	-0.94	0.35	
	Area North	-0.22	0.80	0.14	-1.62	0.11	
	Area Northwest	-0.52	0.59	0.15	-3.51	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p-value*	Sig.
Intellectually Disabled (cont.)	District Areas (cont.)						
	Area South	-0.56	0.57	0.13	-4.26	0.00	**
	Area West	-0.99	0.37	0.13	-7.63	0.00	**
	Area Other	-0.71	0.49	0.37	-1.92	0.05	
	Home Language						
	Spanish	1.93	6.91	1.04	1.86	0.06	
	Arabic	1.18	3.26	1.10	1.08	0.28	
	Vietnamese	0.62	1.85	1.04	0.59	0.55	
	Other	2.79	16.22	1.06	2.62	0.01	**
	Unknown	-11.15	0.00	550.75	-0.02	0.98	
	School Level						
	Middle School	0.14	1.15	0.11	1.26	0.21	
	High School	-0.02	0.98	0.11	-0.19	0.85	
	Combination	0.60	1.82	0.14	4.19	0.00	**
	Years in U.S. Schools						
	2	0.10	1.10	0.33	0.29	0.77	
	3	0.30	1.35	0.32	0.93	0.35	
	4	0.05	1.05	0.34	0.15	0.88	
	5	0.30	1.35	0.33	0.91	0.36	
	6	-0.22	0.80	0.32	-0.70	0.48	
	N/A (Started in U.S.)	-0.03	0.97	0.28	-0.10	0.92	
Specific Learning Disability	Intercept	-2.93	2.49	0.46	-6.40	0.00	**
	EL Status	0.80	0.05	0.09	9.21	0.00	**
	Bilingual Status	-0.52	2.23	0.10	-5.42	0.00	**
	ESL Status	0.09	0.60	0.09	0.97	0.33	
	Economically Disadv.	0.44	1.09	0.05	8.51	0.00	**
	Migrant Status	0.28	1.55	0.54	0.51	0.61	
	Immigrant Status	-0.76	1.32	0.25	-3.08	0.00	**
	Gender (F)	0.45	0.47	0.04	12.35	0.00	**
	% of Hispanic Tchrs	0.00	1.56	0.00	-0.64	0.52	
	% of White Tchrs	0.00	1.00	0.00	-2.39	0.02	*
	Distance from City	0.01	1.00	0.01	1.85	0.06	
	Attendance Rate (%)	-0.02	1.01	0.18	-0.11	0.91	
	Prior Campus Sped %	0.91	0.98	0.38	2.41	0.02	*

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Specific Learning Disability (cont.)	Federal Race						
	Asian/HPI	1.07	2.92	0.09	11.64	0.00	**
	African American	1.16	3.20	0.40	2.94	0.00	**
	Hispanic	-0.22	0.80	0.25	-0.89	0.37	
	Multiple Races	1.02	2.77	0.09	11.15	0.00	**
	Other/Unknown	0.16	1.18	0.23	0.72	0.47	
	District Areas						
	Area East	-0.09	0.92	0.07	-1.22	0.22	
	Area North	-0.09	0.92	0.07	-1.26	0.21	
	Area Northwest	-0.20	0.82	0.07	-2.94	0.00	**
	Area South	-0.34	1.00	0.07	-4.97	0.00	**
	Area West	-0.42	0.66	0.07	-6.43	0.00	**
	Area Other	-0.32	0.72	0.21	-1.55	0.12	
	Home Language						
	Spanish	0.66	1.03	0.41	1.62	0.11	**
	Arabic	0.03	1.27	0.45	0.06	0.95	
	Vietnamese	0.24	3.64	0.41	0.59	0.55	
	Other	1.29	2.10	0.44	2.91	0.00	
	Unknown	0.74	1.00	0.58	1.28	0.20	
	School Level						
	Middle School	0.87	2.95	0.05	15.94	0.00	**
	High School	1.08	1.72	0.06	19.80	0.00	**
	Combination	0.54	1.00	0.08	7.03	0.00	**
	Years in U.S. Schools						
	2	-0.09	0.82	0.12	-0.77	0.44	
	3	-0.20	0.82	0.12	-1.67	0.10	
	4	-0.20	0.89	0.13	-1.53	0.13	
	5	-0.11	1.06	0.15	-0.78	0.43	
	6	0.05	0.93	0.11	0.50	0.62	
	N/A (Started in U.S.)	-0.07		0.08	-0.87	0.38	
Speech Impairment	Intercept	0.84	2.31	0.45	1.85	0.06	
	EL Status	0.52	1.68	0.13	4.11	0.00	**
	Bilingual Status	1.01	2.73	0.10	10.35	0.00	**
	ESL Status	0.02	1.02	0.13	0.12	0.90	
	Economically Disadv.	-0.12	0.88	0.07	-1.74	0.08	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	Migrant Status	-0.73	0.48	1.11	-0.66	0.51	
	Immigrant Status	0.18	1.20	0.20	0.91	0.36	
	Gender (F)	-0.01	0.99	0.05	-0.17	0.87	
	% of Hispanic Tchrs	0.00	1.00	0.00	-1.38	0.17	
	% of White Tchrs	0.00	1.00	0.00	0.70	0.49	
	Distance from City	0.02	1.02	0.01	1.79	0.07	
	Attendance Rate (%)	-2.31	0.10	0.16	-14.36	0.00	**
	Prior Campus Sped %	-0.46	0.63	0.98	-0.46	0.64	
	Federal Race						
	African American	-0.28	0.76	0.11	-2.60	0.01	**
	Hispanic	-1.65	0.19	1.04	-1.58	0.11	
	Multiple Races	0.07	1.07	0.19	0.35	0.73	
	Other/Unknown	-0.03	0.97	0.10	-0.34	0.74	
	District Areas						
	Area East	0.04	1.04	0.12	0.34	0.74	
	Area North	0.10	1.11	0.11	0.96	0.34	
	Area Northwest	-0.10	0.91	0.12	-0.84	0.40	
	Area South	-0.05	0.96	0.11	-0.42	0.68	
	Area West	0.01	1.01	0.10	0.06	0.95	
	Area Other	-1.51	0.22	0.74	-2.05	0.04	*
	Home Language						
	Spanish	0.60	1.82	0.38	1.60	0.11	
	Arabic	-0.09	0.91	0.42	-0.22	0.83	
	Vietnamese	-0.03	0.97	0.37	-0.09	0.93	
	Other	1.14	3.13	0.43	2.66	0.01	**
	Unknown	0.76	2.13	0.54	1.41	0.16	
	School Level						
	Middle School	-1.94	0.14	0.12	-16.04	0.00	**
	High School	-2.73	0.07	0.15	-17.94	0.00	**
	Combination	-0.69	0.50	0.10	-6.62	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	Years in U.S. Schools						
	2	-0.13	0.88	0.17	-0.79	0.43	
	3	-0.02	0.98	0.17	-0.11	0.91	
	4	0.24	1.27	0.17	1.42	0.16	
	5	0.11	1.11	0.18	0.59	0.56	
	6	-0.48	0.62	0.17	-2.81	0.01	**
	N/A (Started in U.S.)	-0.23	0.80	0.12	-1.83	0.07	

Mean dependent var	1.47	SD dependent var	1.55
Pseudo r-squared	0.12	Number of obs	21,947
Chi-square	6,969.73	Prob > chi2	0.00
Akaike crit. (AIC)	51,406.75	Bayesian crit. (BIC)	52,622.20

** *p*<.01, * *p*<.05

2017-2018

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Not Disabled (Base Outcome)							
Emotionally Disturbed	Intercept	-2.49	0.08	0.40	-6.29	0.00	**
	EL Status	-0.16	0.85	0.20	-0.78	0.44	
	Bilingual Status	-1.13	0.32	0.16	-7.29	0.00	**
	ESL Status	-0.45	0.64	0.14	-3.14	0.00	**
	Economically Disadv.	0.54	1.72	0.10	5.54	0.00	**
	Migrant Status	1.00	2.73	0.95	1.06	0.29	
	Immigrant Status	0.83	2.30	0.22	3.87	0.00	**
	Gender (F)	0.61	1.84	0.05	12.41	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.11	0.92	
	% of White Tchrs	-0.01	0.99	0.00	-5.42	0.00	**
	Distance from City	0.06	1.06	0.01	6.93	0.00	**
	Attendance Rate (%)	-1.07	0.34	0.20	-5.47	0.00	**
	Prior Campus Sped %	8.80	6,621.53	0.81	10.81	0.00	**
	Federal Race						
	Asian/HPI	0.47	1.60	0.12	3.80	0.00	**
	African American	-0.42	0.66	0.79	-0.53	0.60	
	Hispanic	-0.11	0.89	0.26	-0.43	0.66	
	Multiple Races	0.12	1.12	0.13	0.92	0.36	
	Other/Unknown	-0.47	0.63	0.37	-1.28	0.20	
	District Areas						
	Area East	-0.22	0.80	0.10	-2.15	0.03	*
	Area North	-0.20	0.82	0.10	-2.13	0.03	*
	Area Northwest	-0.27	0.77	0.10	-2.59	0.01	**
	Area South	-0.22	0.80	0.09	-2.50	0.01	*
	Area West	-0.30	0.75	0.09	-3.16	0.00	**
	Area Other	-5.43	0.00	0.77	-7.06	0.00	**
	Home Language						
	Spanish	0.77	2.15	0.08	10.00	0.00	**
	Arabic	1.45	4.25	0.28	5.15	0.00	**
	Vietnamese	0.71	2.03	0.49	1.46	0.14	
	Other	0.06	1.06	0.16	0.36	0.72	
	Unknown	0.66	1.93	0.21	3.12	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Emotionally Disturbed (cont.)	School Level						
	Middle School	0.04	1.04	0.08	0.50	0.62	
	High School	0.17	1.19	0.08	2.23	0.03	*
	Combination	-0.08	0.92	0.12	-0.70	0.49	
	Years in U.S. Schools						
	2	0.32	1.38	0.28	1.16	0.24	
	3	0.34	1.41	0.27	1.29	0.20	
	4	0.17	1.19	0.27	0.63	0.53	
	5	0.00	1.00	0.28	0.01	0.99	
	6	-0.51	0.60	0.26	-1.94	0.05	
	N/A (Started in U.S.)	0.07	1.08	0.28	0.26	0.79	
Intellectually Disabled	Intercept	0.02	1.02	0.76	0.03	0.98	
	EL Status	0.37	1.45	0.50	0.74	0.46	
	Bilingual Status	-0.85	0.43	0.28	-3.06	0.00	**
	ESL Status	-0.60	0.55	0.27	-2.23	0.03	*
	Economically Disadv.	0.32	1.37	0.12	2.59	0.01	*
	Migrant Status	-15.17	0.00	4,814.62	0.00	1.00	
	Immigrant Status	0.19	1.21	0.61	0.31	0.76	
	Gender (F)	-0.17	0.84	0.08	-2.05	0.04	*
	% of Hispanic Tchrs	-0.01	0.99	0.00	-1.85	0.06	
	% of White Tchrs	0.00	1.00	0.00	-1.79	0.07	
	Distance from City	0.05	1.05	0.01	3.86	0.00	**
	Attendance Rate (%)	-1.81	0.16	0.24	-7.58	0.00	**
	Prior Campus Sped %	1.40	4.06	1.21	1.16	0.25	
	Federal Race						
	Asian/HPI	0.01	1.01	0.14	0.05	0.96	
	African American	0.60	1.83	0.66	0.91	0.36	
	Hispanic	-0.91	0.40	0.44	-2.05	0.04	*
	Multiple Races	-0.60	0.55	0.15	-4.10	0.00	**
	Other/Unknown	0.20	1.23	0.27	0.74	0.46	
	District Areas						
	Area East	-0.44	0.64	0.16	-2.81	0.01	**
	Area North	-0.35	0.70	0.13	-2.65	0.01	**
	Area Northwest	-0.64	0.53	0.15	-4.45	0.00	**
	Area South	-0.76	0.47	0.13	-5.75	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Intellectually Disabled (cont.)	District Area (cont.)						
	Area West	-1.10	0.33	0.13	-8.84	0.00	**
	Area Other	-34.85	0.00	15,103.99 K	0.00	1.00	
	Home Language						
	Spanish	-1.12	0.33	0.18	-6.24	0.00	**
	Arabic	-1.74	0.18	1.03	-1.69	0.09	
	Vietnamese	-15.11	0.00	1,349.69	-0.01	0.99	
	Other	0.20	1.23	0.18	1.15	0.25	
	Unknown	-0.71	0.49	0.42	-1.68	0.09	
	School Level						
	Middle School	0.26	1.29	0.11	2.25	0.03	*
	High School	-0.02	0.98	0.12	-0.16	0.88	
	Combination	0.57	1.77	0.15	3.91	0.00	**
	Years in U.S. Schools						
	2	0.19	1.21	0.64	0.30	0.77	
	3	0.02	1.02	0.64	0.03	0.97	
	4	0.43	1.53	0.59	0.71	0.48	
	5	0.50	1.65	0.60	0.83	0.41	
	6	0.36	1.44	0.56	0.65	0.51	
	7	-0.32	0.73	0.68	-0.47	0.64	
	N/A (Started in U.S.)	0.19	1.21	0.64	0.30	0.77	
Specific Learning Disabled	Intercept	-2.90	0.06	0.36	-8.15	0.00	**
	EL Status	-0.26	0.77	0.19	-1.41	0.16	
	Bilingual Status	-0.18	0.83	0.10	-1.88	0.06	
	ESL Status	-0.14	0.87	0.09	-1.53	0.13	
	Economically Disadv.	0.51	1.67	0.07	7.76	0.00	**
	Migrant Status	0.03	1.03	0.87	0.04	0.97	
	Immigrant Status	-0.21	0.81	0.27	-0.78	0.44	
	Gender (F)	0.52	1.68	0.04	14.17	0.00	**
	% of Hispanic Tchrs	0.00	1.00	0.00	0.05	0.96	
	% of White Tchrs	0.00	1.00	0.00	0.88	0.38	
	Distance from City	0.01	1.01	0.01	0.90	0.37	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Specific Learning Disabled (cont.)	Attendance Rate (%)	0.14	1.15	0.19	0.72	0.47	
	Prior Campus Sped %	4.14	62.91	0.57	7.26	0.00	**
	Federal Race						
	Asian/HPI	0.92	2.52	0.09	9.99	0.00	**
	African American	1.01	2.75	0.45	2.27	0.02	*
	Hispanic	-0.21	0.81	0.24	-0.86	0.39	
	Multiple Races	0.92	2.50	0.09	10.10	0.00	**
	Other	0.29	1.33	0.21	1.34	0.18	
	District Areas						
	Area East	-0.05	0.96	0.07	-0.62	0.54	
	Area North	-0.12	0.89	0.07	-1.63	0.10	
	Area Northwest	-0.18	0.84	0.07	-2.58	0.01	*
	Area South	-0.28	0.76	0.07	-3.93	0.00	**
	Area West	-0.41	0.66	0.07	-6.15	0.00	**
	Area Other	-5.65	0.00	0.91	-6.22	0.00	**
	Home Language						
	Spanish	-0.56	0.57	0.06	-9.47	0.00	**
	Arabic	-0.40	0.67	0.35	-1.15	0.25	
	Vietnamese	-0.02	0.98	0.42	-0.04	0.97	
	Other	-0.01	0.99	0.12	-0.10	0.92	
	School Level						
	Middle School	0.73	2.08	0.06	12.67	0.00	**
	High School	1.02	2.78	0.06	17.92	0.00	**
	Combination	0.62	1.86	0.08	7.85	0.00	**
	Years in U.S. Schools						
	2	0.81	2.24	0.25	3.31	0.00	**
	3	0.97	2.63	0.24	4.08	0.00	**
	4	1.27	3.56	0.23	5.51	0.00	**
	5	1.68	5.35	0.23	7.31	0.00	**
	6	1.49	4.44	0.22	6.68	0.00	**
	N/A (Started in U.S.)	-0.05	0.96	0.27	-0.17	0.87	

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment	Intercept	1.08	2.95	0.28	3.81	0.00	**
	EL Status	1.66	5.27	0.15	11.13	0.00	**
	Bilingual Status	0.75	2.11	0.10	7.71	0.00	**
	ESL Status	0.11	1.11	0.13	0.81	0.42	
	Economically Disadv.	-0.11	0.89	0.08	-1.38	0.17	
	Migrant Status	-14.28	0.00	1,619.37	-0.01	0.99	
	Immigrant Status	-0.19	0.83	0.24	-0.79	0.43	
	Gender (F)	-0.03	0.97	0.05	-0.63	0.53	
	% of Hispanic Tchrs	0.00	1.00	0.00	-0.91	0.36	
	% of White Tchrs	0.00	1.00	0.00	-2.13	0.03	*
	Distance from City	-0.01	1.00	0.01	-0.52	0.60	
	Attendance Rate (%)	-2.11	0.12	0.16	-13.34	0.00	**
	Prior Campus Sped %	0.09	1.09	1.02	0.08	0.93	
	Federal Race						
	Asian/HPI	-0.43	0.65	0.11	-4.00	0.00	**
	African American	-0.71	0.49	0.78	-0.91	0.36	
	Hispanic	-0.19	0.83	0.18	-1.04	0.30	
	Multiple Races	-0.08	0.92	0.10	-0.84	0.40	
	Other/Unknown	-0.17	0.85	0.22	-0.76	0.45	
	District Areas						
	Area East	-0.24	0.79	0.12	-1.98	0.05	*
	Area North	-0.08	0.92	0.11	-0.75	0.45	
	Area Northwest	-0.27	0.76	0.12	-2.30	0.02	*
	Area South	-0.08	0.93	0.11	-0.68	0.50	
	Area West	0.10	1.11	0.10	1.00	0.32	
	Area Other	-30.61	0.00	8,001.50 K	0.00	1.00	
	Home Language						
	Spanish	-0.84	0.43	0.11	-7.84	0.00	**
	Arabic	-0.89	0.41	0.37	-2.39	0.02	*
	Vietnamese	0.32	1.38	0.42	0.77	0.44	
	Other	-0.08	0.93	0.13	-0.58	0.56	
	Unknown	-1.03	0.36	0.23	-4.44	0.00	**
	School Level						
	Middle School	-1.95	0.14	0.12	-15.83	0.00	**
	High School	-2.91	0.06	0.17	-17.26	0.00	**
	Combination	-0.58	0.56	0.10	-5.75	0.00	**

Sped Category	Predictor Variables	Coef.	Odds Ratio	Std. Err.	z	*p*-value	Sig.
Speech Impairment (cont.)	Years in U.S. Schools						
	2	-0.38	0.68	0.15	-2.49	0.01	*
	3	-0.89	0.41	0.16	-5.54	0.00	**
	4	-1.53	0.22	0.18	-8.31	0.00	**
	5	-1.49	0.23	0.20	-7.40	0.00	**
	6	-1.16	0.31	0.22	-5.22	0.00	**
	N/A (Started in U.S.)	0.37	1.45	0.14	2.59	0.01	*

Mean dependent var	1.44	SD dependent var	1.55
Pseudo r-squared	0.13	Number of obs	21,740
Chi-square	7,540.59	Prob > chi2	0.00
Akaike crit. (AIC)	50,171.71	Bayesian crit. (BIC)	51,385.72

** *p*<.01, * *p*<.05