HOW CLASSROOM CONTEXT IMPACTS THE ACADEMIC ACHIEVEMENT OF ENGLISH LEARNERS IN A NEW IMMIGRANT DESTINATION

By

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DEDICATION

I dedicate this work to my parents who gave me a love of learning and taught me to question the world around me.

I also dedicate this work to Thomas whose incredible support helped me get to the end.

Finally, I dedicate this work to my kids at HD Cooke and LPBS who inspired me to start this journey.

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CHAPTER I

INTRODUCTION

English learners (Els) are students whose native language is not English and who are learning English at school. During the last several decades, the number of Els attending public schools has nearly doubled, making this group the fastest growing segment of school-age children in the United States (Terrazas & Batalova, 2008). The 2010 census indicated that approximately 22% percent of children spoke a language other than English at home, compared to 10% in 1980 (Ryan, 2013). In spite of programs and policies implemented in public schools to support Els, a stubborn achievement gap between Els and native English speakers (NESs) has persisted over time. On average, Els score lower on standardized tests than their NES peers of all races (Batalova, Fix, & Murray, 2007) and are more likely to drop out of high school (NCELA, 2011; Gandara, Rumberger, Maxwell-Jolly & Callahan, 2003).

The achievement gap between Els and NESs is commonly attributed to both student and school factors. One research vein compares the personal characteristics of Els and NESs, such as socio-economic status, race or ethnicity, and parent education, to explain their differential achievement scores (Alba et al., 2011; Portes & Zhou, 1993; Tellez & Waxman, 2008). Other research credits the achievement gap to school level factors, such as the concentration of poverty within the school or the type of English Language Development (ELD) program being used (e.g. bilingual education or English immersion) (Christensen & Stanat, 2007).

Fewer studies of Els focus specifically on how characteristics of a student's classroom may help explain variation in El achievement. The purpose of this dissertation is to begin to build a foundational knowledge around classroom contexts that are productive for English learners in new immigrant destinations. Specifically, I describe the segregation of Els from NESs and access to trained ESL teachers as well as the impact of those factors on El achievement in North Carolina, a so-called new immigrant destination with a diverse mix of urban and rural school districts. In this study I conceptualize segregation as the extent to which Els are isolated from their NES classmates in their academic classes; trained teachers are those who have earned an ESL credential or who have taught at least 2 Els in the previous year (Master, Loeb, Whitney, & Wyckoff, 2012). I address the following research questions:

1. To what extent are Els segregated from native English speakers within their math and language arts classes?
    a. How does segregation vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles?
2. How frequently are Els taught by an ESL credentialed or El experienced teacher in their math and language arts classes?
    a. How does access vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles?
3. How does the classroom context of reception impact student achievement?
    a. Does the degree of classroom segregation impact El achievement on standardized tests of math and language arts?
    b. Does being taught by an ESL credentialed or El experienced teacher impact El achievement on standardized tests of math and language arts?
    c. Does the effect of being in a segregated class differ for students who are or are not taught by an ESL credentialed or El experienced teacher?

Current Explanations for El Underachievement

One factor likely contributing to the persistently low achievement of Els is that on average they attend segregated schools. Segregation typically refers to the separation of minority students from White students, but can also refer to the separation of students because of their socio-economic status or linguistic proficiency (Orfield, Kucsera, & Siegel-Hawley, 2012). English learners are the most isolated group in U.S. schools (Goldsmith, 2003; Faltis & Arias, 2007): 10% of the nation's schools enroll about 70% of elementary school aged Els (Whittenberg, 2011). Segregation *between* schools is problematic because access to resources is tied to a student's race, ethnicity, and class (Orfield & Lee, 2005; Logan, Minca, & Adar, 2012). Because race and class are closely related, highly segregated schools tend to be schools with a high concentration of poverty (Orfield & Lee, 2005). A school's racial, ethnic, and socio-economic composition is strongly correlated with student achievement, access to high quality teachers, and school drop out .

Some evidence suggests that Els are also segregated from native English speakers *within* schools due to linguistic proficiency (Faltis & Arias, 2013; Callahan, 2005). To some extent, segregation from NESs within schools is a direct and natural result of the way schools structure English language development (ELD) programs for Els. Els may be pulled out of regular classroom settings and grouped together in a segregated classroom setting to receive targeted assistance in English reading, writing, speaking, and listening (Aguilar, Canche, & Sabetghadam, 2012).

In other cases, Els are segregated from NESs because schools practice academic tracking (Kanno & Cangas, 2014; Callahan, 2004). Because Els are typically low achieving students, schools may track them into low-level math or language arts classes, where they have limited exposure to NESs.

There is little empirical evidence to show whether Els are systematically segregated from or included with the mainstream student population within schools. Moreover, research that investigates whether segregated or inclusive classroom environments are better suited for supporting the language development of Els and increasing their academic achievement is inconclusive (Aguilar, et al, 2012). Currently, the way schools are structured to support Els is largely based on opinions or assumptions about how Els learn and their potential for academic achievement instead of research-based practices (Kanno & Kangas, 2014; Reeves, 2004).

In addition, inadequately prepared teachers may not effectively support Els' linguistic and academic development (Harklau, 2004) and may contribute to underachievement and the El achievement gap. Research related to second language acquisition, socio-cultural theory, linguistics, and child development agree on the fundamental knowledge and skills necessary to support English learners in learning both content and English (Genesee, 2005; Ballentyne, 2008; Tellez & Waxman, 2006; Goldenberg, 2008; Webster & Valeo, 2011). Put simply, this knowledge includes understanding the linguistic components of English (e.g. grammar, syntax, morphology, pragmatics); the language acquisition process; social-cultural theory and how culture shapes the learning process; and how to differentiate instruction for students with varying proficiency in reading, writing, listening, and speaking.

Teachers who study teaching English as a second language are more likely to be trained to understand and use the knowledge and skills listed above. However, mainstream teachers, that is, those who do not have formal training in teaching English as a second language, may only receive a brief introduction to any of the categories of the research-based knowledge and skills described above. A pervasive theme across studies of teachers working with Els is that there tends to be a shortage of ESL certified or trained teachers (Wainer, 2006) and that many teachers who teach these students feel ill equipped for the task (Gandara, 2005; Gandara, Rumberger, Maxwell-Jolly & Callahan, 2003). Lack of adequate preparation is hardly surprising given reports that find that the majority of teacher preparation programs do not offer specific degrees in teaching Els, and less than half of these programs require even a single class on educating culturally and linguistically diverse students (Lopez, 2013; Menken & Antunez, 2001; Morrier, Irving, Dandy, Dmitriyev, & Ukeje, 2007).

Few studies have actually investigated how teacher credentialing or preparation are related to El achievement. Despite an abundance of research debating the relative merits of teacher credentialing, experience, training, and other characteristics for increasing student achievement (Cochran-Smith, et al, 2012; Darling-Hammond, Goe, 2007; Henry, Bastian, & Fortner, 2011; Henry et al. 2014; Kane, Rockoff, & Steiger, 2007; Harris & Sass, 2011), studies specifically focused on how these same characteristics impact Els are scarce. Two recent studies are the first to analyze how teacher characteristics are related to El achievement using a large sample and find that credentialing, experience teaching Els, and second-language proficiency are important predictors of increased achievement (Master, et. al., 2012; Loeb, Soland, & Fox, 2014). . Thus, limited research related to who teaches Els suggests systematic problems but has not provided sufficient evidence about which policy levers, such as changing credentialing or preparation requirements, can be manipulated to improve Els' achievement and reduce performance gaps.

Els may be under-achieving at school not only because of school characteristics, but also because of their family and personal histories. Els are a distinct group of students both because they are learning English in schools and because they are typically immigrants or the children of immigrants. Immigrants, especially those who are minorities and who have low socioeconomic status, tend to be a marginalized population.

Historically, immigrants from all nations tended to concentrate in what demographers call "traditional destination states": California, Texas, New York, New Jersey, Illinois, and Florida (Hirschman & Massey, 2008). As such, the vast majority of research on immigrants and Els is situated in the context of traditional destination states. However, in the last few decades, immigration patterns have changed dramatically, bringing immigrant adults and children to states, districts, and schools that previously had little experience providing services to this population (Hall, 2012; Suro & Singer, 2002). The antecedent for this rapid growth in the El population was the mass migration of immigrants, particularly from Mexico and Central America, in the 1990s. Table 1 illustrates the increasing number of foreign-born residents in selected "new immigrant" states from 1990-2000 and from 2000-2011.

Table 1 ***Growth in the Foreign Born Population from 1990-2000.***

	1990 to 2000			2000 to 2011	
	% Change	Rank		% Change	Rank
United States	57.4%		**United States**	29.8%	
North Carolina	273.7%	1	Tennessee	92.9%	1
Georgia	233.4%	2	South Carolina	91.4%	2
Nevada	202.0%	3	Alabama	85.3%	3
Arkansas	196.3%	4	Kentucky	74.9%	4
Utah	170.8%	5	Arkansas	74.8%	5
Tennessee	169.0%	6	Delaware	70.1%	6
Nebraska	164.7%	7	Nevada	65.0%	7
Colorado	159.7%	8	North Carolina	64.7%	8
Arizona	135.9%	9	Indiana	64.7%	9
Kentucky	135.3%	10	Wyoming	64.1%	10

Sources: American Community Survey, 2011; US Census Bureau, 1990, 2000 Census of Population and Housing

Scholars have uncovered many similarities and some important differences between new and traditional destinations that might be important for the academic achievement of Els. Els in new destinations comprise a smaller proportion of the total population (Suro & Singer, 2002) and are more dispersed across rural, urban, and suburban districts (Johnson & Lichter, 2008; Fry, 2010). Schools in new destinations tend to have fewer resources, such as trained teachers or translators, that specifically target the needs of Els and their families (Bohon, et al, 2006). On the other hand, schools that enroll Els in new immigrant destinations tend to be smaller and more affluent (Fry, 2010). Despite these differences, schools in both traditional and new destinations struggle to find credentialed ESL teachers, have difficulties developing strong home- school relationships, and are unable to help all Els reach English proficiency (Bohon, Macpherson, & Atiles, 2005).

The literature on the education of Els in new destinations is limited. Most findings derive from reports and qualitative studies of individual schools or districts at one point in time, and so do not provide adequate description or analyses of broad trends in school contexts or El achievement (Wainer, 2006; Bohon, et al, 2006). Quantitative studies of schools in new destinations focus on urban areas and at one or two points in time (Stamps & Bohon, 2006; Fry, 2010; Fischer, 2010; Dondero & Mueller, 2012; Clotfelter, Ladd, & Vigdor, 2012). Much of this work focuses on Latino students, as opposed to Els (Dondero & Mueller, 2012; Clotfelter, Ladd, & Vigdor, 2012). While most Els are Latino, the converse is not true and so findings about Latino students do not necessarily generalize to the El population. These studies also use data that is aggregated to the school, district, or community (e.g. town, Metropolitan Statistical Area) level and so do not describe differences in classrooms within schools or analyze the relationship between classroom characteristics and individual achievement.

Theoretical Framework

To understand the academic experiences of Els I turn to theoretical frameworks that explain immigrant assimilation and the importance of teachers for at-risk student populations. My study is grounded in the theory of segmented assimilation, which posits that positive assimilation is conditional on the context of reception, defined essentially as the social and structural characteristics of the communities to which immigrants migrate (Portes & Zhou, 1993). Borrowing from this theory, I conceptualize the classroom and school as important contexts of reception that influence students' assimilation. Within the school context, positive assimilation is indicated by high academic achievement and proficiency in English. I define the context of reception within the school setting as the structures that support Els' second language acquisition, such as the type of English language development model; how receptive the school community is to El students, indicated by Els integration into the broader school community; and the size of the El population within the school (Callahan, Wilkinson, & Muller, 2008; Fischer, 2010).

Importantly, the school context of reception can influence the extent to which Els are segregated from or included with English proficient students in their classes and their access to trained ESL teachers. I concentrate on two of the five dimensions of segregation defined in the literature: evenness and exposure (Massey & Denton, 1988). Evenness describes the distribution of Els within a unit (e.g. classrooms, schools, or districts) and exposure describes the extent to which Els interact with non-Els within a unit. Within the school, evenness and exposure serve as indicators of both structures that support Els as well as how receptive the community is to the needs of Els. Very uneven distributions of Els or very low exposure of Els to NESs across a school likely indicates that a school tracks Els into particular classes for academic or other reasons. Exposure can also be related to the size of the El population: high exposure to NESs may result from Els being a small proportion of the total population.

The school context is intertwined with the community context, which includes not only the school district but also the neighborhoods surrounding the schools. The community context of reception, which includes government policies, societal attitudes, and the strength of the co-ethnic community, will have implications for how schools serve Els. Portes and Zhou (1993) illustrate the importance of community contexts for shaping educational opportunities by comparing the experiences of Cuban and Haitian immigrants to Florida. Cubans were welcomed to the U.S. as political refugees after the Cuban revolution, and eligible for federal loans and other supports that helped foster a strong and economically diverse co-ethnic community. This community created a system of private schools targeted to Cuban children, and also prompted the creation of the nation's first bilingual public schools. Haitians, on the other hand, were not protected from prejudiced attitudes towards minorities held by the majority population in the U.S, were not systematically provided government benefits, and were not as successful in creating strong networks among the co-ethnic community that could help provide educational opportunities. Located in low-income, urban schools, Haitian immigrant children have fewer opportunities for positive assimilation, in terms of high academic achievement, into the middle class than their Cuban counterparts. The result of these disparate contexts was a wide achievement gap between Haitian and Cuban students (Rumbaut, 2005; Suarez-Orozco &

Suarez-Orozco, 2006). In a study of the differential achievement of more and less advantaged immigrant groups, Portes and MacLeod (1996) found that Haitian and Mexican scored from 10 to 15 points lower than Cuban and Vietnamese students, even after controlling for socioeconomic status, length of residence in the US, and number of hours spent on homework. Motivated by findings from research on how the community context of reception shapes educational opportunities, this study describes both the class and school context of reception and tests whether the class context of reception is related to El achievement.

Communities in North Carolina, where this study is situated, have a distinctly different history of immigration compared to Miami, a traditional hub for new immigrants. Historical differences, as well as current state and local policies, shape the social reception of immigrants into communities and the development of strong co-ethnic communities. Mexican migration to North Carolina was driven by low-wage jobs in agriculture, poultry processing, and blue-crab processing (Griffitch, 2005; Wainer, 2006). The working conditions in these industries can be hazardous and unappealing, and there have been documented cases of laborers being treated like share-croppers: "Rents are deducted from workers paychecks and couples may occupy trailers together only on the condition that both work at the plant" (Griffith 1993, p. 181, cited in Griffith, 2006). Over time, as the population of immigrants has grown, a stronger co-ethnic community has emerged. Immigrants have opened businesses and become an increasingly important part of the economy (Griffith, 2006). At the same time, business and institutions have increasingly catered to the Spanish speaking community by offering services in Spanish. It is unclear how changing context of reception for immigrant students in North Carolina may be impacting school context and student achievement.

The theory of segmented assimilation helps frame how communities and peers can impact El achievement, but additional theory is needed to understand how individuals might shape an El's school experience. I use Stanton-Salazar's (1997) theory of Institutional Agents to frame how and why teachers have a key role in helping Els access institutional resources, including knowledge of how American schools work and academic opportunities. Teachers, as institutional agents, are in the position to advocate for Els within the school community, serve as role models, and provide guidance. I posit that teachers who have indicated a commitment to working with Els by obtaining an ESL credential or those who have gained practical experience working with these students on the job, either by choice or by chance, are most likely and capable to fill the role of a positive institutional agent in a state like North Carolina.

The qualifications for becoming an ESL certified teacher are lax in North Carolina. Teachers can earn an ESL endorsement and by considered certified by simply passing the *English to Speakers of Other Languages* Praxis II test, without having to complete any ESL specific program of study or any hours of clinical observation. Despite the minimal requirements, less than 3% of teachers in North Carolina have earned an ESL credential[1]. This is likely because North Carolina policy requires that only teachers who teach an ESL course (a course designed specifically for Els focused on language proficiency rather than content knowledge) have a certification. However, the majority of Els in North Carolina are not enrolled in an ESL class, leaving most Els in classrooms where the teacher does not have an ESL credential.

[1] Author's calculation using data provided by the North Carolina Department of Public Instruction

Similarly, very few teachers in North Carolina have received formal training for teaching Els. In 2012, there were 74 teacher preparation providers and 841 teacher preparation programs[2] in North Carolina, enrolling 20,245 students and graduating 6,613 teachers (US DOE, 2015). Of those, 11 providers offered any programs designed specifically for preparing ESL teachers, for a total of 12 distinct programs. Eight of these were undergraduate ESL programs, two were graduate level ESL programs, and two were ESL add-on programs. There were no programs for preparing bilingual educators.

One hundred and fifteen students completed an ESL program in 2012 (out of 6,613 program completers, representing 1.7%), and 42 graduates from these programs received an ESL credential by taking and passing the Praxis II exam. The number of ESL credentials earned represents 0.8% of the total number of credentials earned in 2012. The few teachers who decide to complete an undergraduate or graduate program for teaching ESL or who decide to earn a credential are likely quite different than the average teacher. For some reason or other, they are not only motivated to teach these children but also to formally learn the knowledge and skills they might need to adequately support these students.

In the North Carolina context, where so few teachers have an ESL credential, it might be that teachers primarily learn how to teach Els through experience. Research indicates that Els taught by teachers with experience working with Els saw higher achievement gains (Master, et al, 2006). A teacher who has substantial experience working with Els might develop knowledge and skills necessary for being a positive institutional agent. Further, years of experience

[2] "Teacher preparation providers are institutions and organizations that offer teacher preparation programs. Teacher preparation programs are the individual programs offered within each provider" (US DOE, 2015).

teaching Els may indicate that the teacher is motivated to work with these students. At present, however, research does not provide evidence related to how experience and the capacity for teachers to be institutional agents are related.

Significance

In my dissertation, I seek to fill the knowledge gaps described above and illuminate contextual variables within classrooms that influence the academic outcomes of Els in a new immigrant destination. By contextual variables, I mean the extent to which Els are segregated from native English speakers in their classrooms and whether their teacher has an ESL credential or El experience. To answer my research questions I use descriptive analyses and ordinary least squares regression, described in Chapter 3. In order to control for non-random sorting of students into schools and classrooms, I also estimate models that employ student and school fixed effects.

My research lays important groundwork for understanding how segregation, teacher characteristics, and immigration patterns impact the academic lives of Els. Many of the research gaps described above are a result of data constraints. In order to analyze both within-school segregation and teacher effectiveness on a large scale, researchers need data where students can be linked to their teachers and classmates. My dissertation uses information from a comprehensive and longitudinal dataset from North Carolina in which students have been matched to their teachers to overcome many data-related obstacles that have stymied other researchers.

I make three distinct contributions to the literature related to school improvement for students at-risk of academic failure. First, my study offers a unique contribution to the abundant literature on school segregation by describing the segregation of Els from non-Els in their schools and quantifying any impact segregation may have on El achievement. Next, as the first study to investigate the level of access Els have to credentialed or trained teachers across an entire state as well as how this access impacts achievement, my dissertation adds both to the literature on equitable access to resources for at-risk students as well as the literature on teacher effectiveness. Finally, my data come from North Carolina, a new destination state that has experienced one of the fastest growing immigrant populations across the country. Thus, my study will extend what scholars know about the educational experiences of Els within new destinations.

Overview of the Dissertation

Els are a marginalized and at-risk student population, who make up an increasingly large proportion of public school students. These students are no longer solely concentrated in large urban centers in border-states and immigrant gateways, but are enrolled in rural, suburban, and urban schools across the country. This demographic reality, coupled with the persistent achievement gap between Els and native English speaking students, demands that states, districts, and schools reexamine how they structure schools and recruit, retain, and train teachers to adequately support Els.

The sum of this dissertation proceeds as follows. In Chapter 2 I review literature related to the classroom and school contexts of English learners as well as what factors contribute to El achievement. To begin, I describe the El population in general and explain why this population is considered at-risk of academic failure. I then give a brief legal explanation for why schools are required to provide special services to Els. The bulk of the chapter details how segregation, teacher characteristics, and immigration trends are related to the experiences Els have in their classrooms and schools.

In the second part of Chapter 2, I present a theoretical framework grounded in the preceding literature. Based on what we know from previous scholarly work, as well as the theories of segmented assimilation (Portes & Zhou, 1993) and institutional agents (Stanton-Salazar, 1999), I derive two hypotheses that I test using the methods presented in Chapter 3.

In Chapter 3, I detail the descriptive and analytical methods I will use to answer my three research questions, as well as why these methods are appropriate. I describe the data and the construction of the analytical sample, and then present the models I will use to estimate the relationship between classroom context and El achievement. Additionally, I operationalize the constructs presented in the theoretical framework and describe how variables are measured. I end with a discussion of the limitations of my study and my strategies for addressing them.

In Chapter 4, I present the results of my descriptive and regression analyses. To preview results, in answer to the first research question I find that Els are mostly integrated with their NES peers. Students currently learning English tend to be less integrated than students who have reclassified as English proficient. Although Els are mostly integrated, El exposure to NES has been decreasing over time and the distribution of Els across classrooms has become less even. Findings related to the second research question show that less than 5% of Els are taught by an ESL credentialed teacher but more than half of Els are taught by an El experienced teacher. Importantly, there is evidence that Els are systematically assigned to teachers who either have an ESL credential or El experience. Finally, regression analyses do not indicate a strong relationship between being in a segregated class and El achievement. Further, findings suggest that Els taught by ESL certified teachers perform no differently than Els taught by teachers without an ESL credential. However, there is evidence to suggest that Els taught by an El experienced teacher perform better than Els who are taught by teachers without El experience.

Lastly, in Chapter Five I summarize and interpret the results and discuss the implications the findings have for research, policy, and practice. Major recommendations are related to teacher and principal preparation, supporting schools with a low concentration of Els, and strengthening the credentialing process.

CHAPTER II

LITERATURE REVIEW AND THEORETCAL FRAMEWORK

Who are English Learners?

Els are students who speak a language other than English at home and are learning English at school. In 2011-12, Els comprised slightly more than 9% of students in the public K-12 system across the nation (NCES, 2012). This percentage varies by state; for example, in the 2011-12 school year, less then 1% of students in West Virginia were classified as Els, whereas in California 23% of students were Els. Reports document that elementary school Els tend to be concentrated in a relatively small number of schools (Whittenberg, 2011) and that 39% of schools across the country do not enroll any El students (NCES, 2012).

The majority of Els in the US, about 73%, come from Spanish speaking homes (Pandya, McHugh, & Batalova, 2011; Gandara & Contreras, 2009). Most of the Spanish speaking Els in public schools are of Mexican origin, but the number of Central American students has been steadily increasing (Flores, Batalova, & Fix, 2012). Across the US, 37.6 million people speak Spanish at home and over 1 million people speak each of the following languages: Chinese (2.9 million), Tagalog (1.6 million), Vietnamese (1.4 million), French (1.3 million), German (1.1 million) and Korean (1.1 million) (Ryan, 2013). The language most frequently spoken after Spanish varies by state and region: in California and Nevada it is Tagalog while in North Carolina, Minnesota, and Wisconsin it is Hmong (Batalova & McHugh, 2010).

Researchers describe immigrant students as being of the first, 1.5, second, or third generation (Tellez & Ortiz, 2008). In the US context, first generation immigrants are those who were born in a foreign country and moved to the US themselves as teenagers or adults. The 1.5 generation also immigrated to the US themselves, but are distinguished from the first generation because they immigrated when they were young and so received the majority of their schooling in the US. Rumbaut (2004) explains that immigrants in the 1.5 generation typically identify more strongly with the host culture than immigrants who arrive as adults, but hold on to their native identity more strongly than second-generation immigrants. Second generation immigrants are those who were born in the US, but whose parents were first generation immigrants. Finally, third generation immigrants were also born in the US, and have parents who were second-generation immigrants. Only about 22% percent of Els enrolled in public schools are of the first or 1.5 generation; perhaps surprisingly, the rest are second or third generation immigrants who have received all of their education in the US (Terrazas & Batalova, 2010; Suarez, 2007).

Unlike other sub-groups used for federal accountability purposes, such as those defined by race or gender, El describes a temporary status rather than a permanent characteristic of a student. Students who are learning English are referred to as English learners[3] until they reach a threshold for proficiency in English set by a particular state or district, and are then reclassified as English proficient (Abedi & Liquanti, 2013). These students, typically labeled as "former Els" or "reclassified Els", are informally monitored for several years to ensure their successful transition away from specialized instruction.

[3] There are many terms describing Els. Government agencies tend to use the term LEP, or Limited English Proficient to describe Els. This moniker is problematic as it describes students in terms of their deficits. In this paper I will use the term English learner to refer to students who have been identified as needing language support at school.

Els at risk. Els are consistently on the wrong side of the achievement gap. On average, they perform worse on standardized tests, have higher drop out rates, and have lower college enrollment rates than native English speaking students (NESs). On the 8th grade National Assessment for Educational Progress (NAEP) test of reading and math, students can score below basic, basic, proficient, or advanced. On the 2005 NAEP reading assessment, 27% of NESs scored below basic compared to 71% of Els. At the other end of the spectrum, 28% of NESs scored proficient and 3% scored advanced, while only 4% of Els scored proficient and 0% scored advanced (Batalova, Fix, & Murray, 2007). The gap between Els and NESs on math and reading scores tends to increase from 4th grade to 8th grade (Hemphill, Vanneman & Rahman, 2011).

Some authors have critiqued the use of comparisons of test score between Els and NESs as the former is not a static group (Grissom, 2004; Parrish et al., 2006; Saunders & Marcelletti, 2012). The highest achieving language learners exit El status the most quickly, adding to the pool of non-Els. At the same time, each year recent immigrant students who are not yet proficient in English enroll in public schools and join the El subgroup. The highest achieving students exit El status in earlier grades, leaving lower achieving Els and recent immigrants in the El subgroup in later grades, a trend that may help explain why the achievement gap between Els and non-Els increases as students become older. Saunders and Marcelletti (2013) find no significant achievement gap between native English speakers and Els that have been reclassified on the California standards test of English Language Arts in grades 5, 8, or 10. When they compare current Els and native English speakers, their results replicate the large achievement gaps found in other studies. The same results were found when comparing achievement gaps between reclassified Els and NESs on the NAEP exam (Hemphill, Vanneman & Rahman, 2011) indicating that the distinction between reclassified and current Els is important not only in California, but across the country.

These findings indicate a need to create appropriate comparison groups when identifying achievement gaps. Additionally, they suggest a need to focus attention on how to help students become proficient in English and exit quickly from El status in order to avoid becoming “long term Els”. While definitions vary, long term Els are students who are unable to achieve English proficiency after several years of specialized instruction and persist as Els beyond elementary school. Studies that disaggregate the achievement of Els that have been classified for different periods of time find the risk of below grade level achievement and high school dropout is highest for long term Els (Flores & Park, 2014; Flores, Batalova, & Fix, 2012; Olsen, 2010)

Despite the imperfect quantification of the achievement gap between Els and NESs due to the impermanent nature of the El subgroup, we do know that Els are an at-risk student population both because of their background characteristics as well as the schools they typically attend (Sheng, Sheng & Anderson, 2011). English learners begin their US schooling experience at a disadvantage compared to their native English speaking peers because they must master both content and the English language at the same time (Fuller, Bein, Kim, Rabe-Hesketh, 2015). This disadvantage is exacerbated for students who immigrate at a later age. Els who arrive in middle and high school have more ground to cover in a shorter amount of time in terms of learning content and meeting language demands, as well as adapting to American culture, than those who arrive as young children or who are second generation immigrant students (Hooker, Fix & McHugh, 2014).

On average, Els come from families categorized as having low socio-economic status by virtue of their parents’ income, employment, and educational attainment. Foreign-born immigrant adults tend to have less formal education and earn less money than native-born

Americans, factors that are strongly correlated with student achievement (Gandara & Contreras, 2009). In 2009, 32% of foreign-born immigrants had not received a high school diploma compared to only 11% of native-born Americans (Terrazas & Batalova, 2010). The median household income for immigrant families from Central America, South America, and Africa is about 5,000 to 7,000 dollars lower than that of native-born American families (Portes & Rumbaut, 2014). Immigrant families from these regions are also more likely to live below the poverty line (Capps, et al., 2005; Portes & Rumbaut, 2014).

Aggregate trends notwithstanding, the immigrant population, and thus the El population, is not monolithic. Many adult immigrants are highly educated and skilled and migrate in order to participate in the growing knowledge economies of industrialized nations, such as the US (OECD, 2012; Portes & Zhou, 1993; Portes & Rumbaut, 2014). These immigrants tend to be more likely than the average native- born American to have an advanced degree and typically they and their families thrive in the host country (Suarez-Orozco, 2001). The advantages of this group of immigrants are more than offset by the larger and more typical group of immigrants described above who have less formal education and who possess fewer professional or specialized skills (Massey & Sanchez, 2010; Portes & Rumbaut, 2014).

Regardless of socio-economic status, unfamiliarity with the language and culture of the receiving nation can be an obstacle for the academic success of immigrant youth. Language barriers make it more difficult for parents and children to access programs as well as community based support programs (Sattin-Bajaj, 2011; Delgado-Gaitan, 1992). Parents of immigrant children are often unfamiliar with the expectations of the schools and the opportunities available to their children (Patel, 2012). Further, both immigrant adults and children face discrimination because of their race, ethnicity, or foreign-born status that can hinder social and academic growth (Becker, 1990; Massey & Sanchez, 2010).

An immigrant's documentation status can also place him or her at risk of academic failure (Patel, 2012; Massey & Sanchez, 2010). Being undocumented can impact a parent's ability to obtain stable or well paid employment, can create a climate of instability within a home, and can force families to be more mobile as adults look for housing and jobs. Importantly, undocumented students cannot access federal financial aid and in most states must pay out of state tuition rates, impinging on their ability to attend college (Flores, 2010). Knowing that they may not have the opportunity to go to college, or even obtain well paying or stable employment, can impact the aspirations and achievement of undocumented immigrant students (Patel, 2012).

It takes an El in optimal educational settings about 5-7 years to acquire the academic language proficiency he or she needs to be on par with native English speakers (Hakuta, et al, 2000). Unfortunately, the vast majority of Els are not being educated in ideal school settings. Numerous studies have documented the systematic inequalities that confront Els because of their immigrant background, race/ethnicity, and socioeconomic status (Abedi, Herman, Courtney, Leon, & Kao, 2004; Gándara, Rumberger, Maxwell-Jolly, & Callahan, 2003). Els, especially those from low income families, are likely to attend schools located in segregated, high poverty neighborhoods that have lower quality teachers and principals, higher rates of teacher and principal turnover, fewer resources, and ultimately, lower academic achievement (Ingersoll, 2004; Corcoran & Evans, 2008; Portes, & MacLeod, 1996; Rothstein, 2004)

Els: A special population with unique schooling experiences. Following several court rulings, Els have been deemed a special population who are to be accorded instructional supports while they are learning English. Due to their unique status, Els are often educated in distinct classroom settings by teachers with specialized credentials for some or all of the school day. In this section I review how Els came to be treated as a special population, what we know about the implications of Els' special status on the composition of their classroom peer group and the quality of their teachers, and how these two variables are related to their academic achievement.

Federal laws and Supreme Court decisions. A series of federal actions and court decisions have shaped how English learners are educated. The first was the 1947 Federal District Court ruling in *Mendez vs. Westminster*. A group of parents sued the Westminster, California school district for segregating Mexican immigrant students into a different school based on perceived language and academic deficiencies, a widespread practice in the southwest at that time (Menchaca & Valencia, 1990; San Miguel, 1987). The court ruled that segregating students based on language, race, or nativity violated the 14th amendment and was therefore unconstitutional.

Twenty-seven years later, in the case *Lau v. Nichols* (414 U.S. 563, 1974), the Supreme Court decreed that schools had the obligation to support English language acquisition so that Els would have equal access to educational content. They also ruled that identical education did not mean equal education. Justice Douglas wrote in his opinion:

> Basic English skills are at the very core of what the public schools teach. Imposition of a requirement that, before a child can effectively participate in the educational program, he

> must already have acquired those basic skills is to make a mockery of public education. We know that those who do not understand English are certain to find their classroom experience totally incomprehensible and in no way meaningful (*Lau v. Nichols*, 1974).

As a result, new federal policy required that states take proactive steps in educating English learners, including offering bilingual education or English as a Second Language (ESL) programs.

The third important ruling was made in the case *Castañeda vs. Pickard* (648 F.2d 989, 1981), which was tried in a Federal District Court. Plaintiffs argued that the Raymondsville Independent School District in Texas was discriminating against Mexican-American students by using a within-school tracking system to segregate students, by not hiring Mexican-American faculty and administrators, and by not providing adequate bilingual education to ensure that Els could access the curriculum. The district court ruled in the plaintiffs' favor and created the "Castañeda test" which outlined three requirements schools must follow in supporting Els. First, "the school must pursue a program based on an educational theory recognized as sound"; next, "the school must actually implement the program with instructional practices, resources, and personnel necessary to transfer theory to reality"; and finally, "the school must not persist in a program that fails to produce results" (*Casteñeda v. Pickard*, 1981).

Most recently, the 2001 No Child Left Behind (NCLB) act mandated that states must disaggregate student achievement data to highlight the academic progress of various sub-groups, including English learners, in order to be held accountable for these students' progress. NCLB shed light on the academic gap between of English learners and native English speakers and mandated that schools close that gap. At the same time, NCLB dictated that the Federal Office of Bilingual Education be replaced with the Federal Office of English Acquisition, indicating an emerging preference for English only language instruction that mirrored increasing public antipathy towards public schools providing bilingual education (Crawford, 2002).

Based on these rulings, schools today are required to provide research-based instruction delivered by a competent teacher in a non-segregated environment. However, states and school districts have flexibility in defining the structure of their ELD programs and the qualifications of the personnel equipped to teach Els. As such, Els across the country find themselves in vastly different learning environments, with different rates of segregation from native-English speaking students, and with teachers with varying characteristics.

How are Els Segregated from NES?

In the context of American education, segregation refers to the separation of minority students from White students. The way that segregation is typically addressed in the literature is vestige of the history of racial subjugation and discrimination in the United States. Blacks, Latinos, Native Americans, and other minority groups have existed as marginalized groups struggling to attain equality with Whites and so segregation is most often understood as a separation of students according to their race. In this study I move away from the conceptualization of segregation as based by race and instead consider how students are segregated according to their English language proficiency. Below I explain how minorities in general, and Els in particular, are segregated both between and within schools. Between-school segregation refers to the separation of students who are different in terms of a particular characteristic, be it race/ethnicity, socioeconomic status, or English proficiency, into different schools. Within-school segregation refers to how students are separated from other students into different classes within a particular school.

Between-school segregation. Multiple studies and reports have documented the segregation of minority students from White students between schools, especially in urban settings (Clotfelter et al, 2002; Frankenberg, 2013; Orfield, Kucsera, & Siegel-Hawley 2012; Orfield & Lee, 2005). Orfield and his colleagues (2012) analyzed data obtained from the Office of Civil Rights from 1968 to 1981 and from the National Center for Education Statistics from 1991 to 2010 to document trends in segregation by race and class between schools across the country. They find that segregation, as measured by the percent of minorities attending high minority schools, the dissimilarity index[4], and the exposure index[5], has been increasing for Latino students over the last several decades and that the vast majority, about 80%, of these students attend majority-minority schools (i.e. schools where minorities comprise more than 50% of the school population). They describe evidence of what they term "double segregation" by race and class for Latino students, citing a 71% correlation between the percent of Latinos in a school and the percent of students who are eligible for free or reduced priced lunch, a common indicator of low socioeconomic status. While they do not have data on the number of Els, based on previous research (Gandara & Orfield, 2010; Rothstein, 2004), they speculate that many Latinos additionally face "triple segregation" by race, class, and language proficiency.

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[4] The dissimilarity index measures the proportion of group A within a larger unit (i.e., a district or city) that would have to re-locate in order to achieve the same neighborhood racial distribution as Group B (Massey & Denton, 1988).

[5] The exposure index measures the probability that a random member of group A shares a smaller unit (i.e. classroom, neighborhood) with a member of Group B, conditional on the number of members of Group A and B in the larger unit (school, city) (Massey & Denton, 1988).

Schools serving a higher concentration of El students differ from those that serve lower concentrations or no Els. de Cohen and her colleagues (2005) compare the school conditions, teacher characteristics, and principal qualities in schools with high or low concentrations of Els, or no Els, using data culled from the 1999-2000 Schools and Staffing survey, a nationally representative survey administered to teachers and principals. High concentration El schools are larger, more likely to receive Title 1 money, more likely to be in urban areas, and less likely to enroll White students. Principals of high concentration El schools are more likely to report that poverty and health related issues are a problem than those of low concentration El schools. High El schools tend to offer more student support services, such as pre-K and after-school programs, as well as parent outreach and support programs. Schools with high proportions of Els are much more likely than those with low proportions to provide bilingual programs, but just as likely as other schools to offer English only language support. Teachers in high El schools tend to have fewer years of experience, be less academically prepared, be more likely to hold a provisional or emergency license; but are more likely to have an ESL/Bilingual certification even if teaching ESL is not their main assignment. These differences speak to the impacts of triple segregation, by race, class, and language proficiency on the quality of schools for Els (Orfield et al, 2012): Els are likely to be minorities from low income families, as well as linguistic minorities, and so it is unsurprising that they attend high poverty schools that have less experienced, fewer credentialed, and less prepared teachers.

Schools with a high concentration of Els, immigrants, or Latinos might be beneficial for these students because they can foster positive identity formation and academic attitudes. Goldsmith (2003) uses NELS (National Education Longitudinal Study) data from 1988 and 1992 combined with 1990 Census data to test whether the proportions of Latino and Black students in a school differentially impacted the test scores of Black, Latino, and White students. Using an HLM (Hierarchical Linear Modeling) strategy that controls for student, school, and neighborhood factors, the author shows that proportion Latino is positively correlated to Latino student test scores in reading and science, and does not significantly influence White or Black student test scores. One limitation to this study is that the sample is comprised of students who have valid 12th grade scores in reading, math, science, and history, and thus results may be positively biased due to sample selection. The authors control for 8th grade achievement and factors related with the probability of dropout to try to overcome this limitation.

The authors posit several explanations for the positive correlation between proportion of Latino students and Latino achievement. First, Latino students are more likely to come from two-parent and immigrant families than Black students (Goldsmith, 2003; Wildsmith, Scott, Guzman, & Cook, 2014). Two parent families are likely to have more financial and social capital available to support their children's achievement (Dronkers & Hampden, 2003). Similarly, research suggests that students and parents in immigrant families have higher aspirations than native-born parents (Kao & Tienda, 1995; Schmid, 2001), and so may be more resilient to the impacts of attending schools with fewer resources. Aggregated to the school level, the higher levels of financial, social, and cultural capital, as well as resilience, might create a more positive and academically focused climate. Finally, Latinos in predominantly Latino schools may suffer less discrimination from White peers and adults and may be able to build more positive ethnic identities that can positively impact their achievement.

Callahan and various colleagues (2008, 2009) conducted two studies, using propensity score matching and data from the nationally representative Add Health Survey that found that being labeled an El is positively related to achievement in schools with high concentrations of Els. The authors use school and neighborhood context variables, English proficiency, and prior achievement to match Mexican immigrant students (2008) or immigrant students of any nationality (2009) who were placed in ESL classes to those who were not. They then compared the academic achievement of these two groups of students conditional on their generational status and whether they were enrolled in a high-El school (>55% El students) or low-El school (<55% El students).

Mexican-American immigrant students enrolled in low-concentration schools and placed in ESL classes had lower GPAs and were less likely to enroll in college prerequisite courses than their matched counterparts who were not enrolled in ESL classes. This negative relationship was highly significant for first generation immigrants. These findings were mostly reversed in high El concentration schools, where second and third generation students received the most positive benefit of enrolling in ESL classes, but first generation immigrants in ESL classes saw no improvement in academic outcomes. The authors suggest that in high El concentration schools, the large co-ethnic community (e.g., the community comprised of students from similar racial, ethnic, or native country background) protects immigrant students from the negative repercussions that are expected to arise when students attend linguistically or racially isolated schools (Callahan, 2004). The findings may be biased due to sample selection. The authors restrict the overall, nationally representative sample to include only Mexican-American students attending one of the 23 (out of 78) schools participating in the Add Health Survey that offered ESL, and who also had complete transcript data for both the 1995 and 2001 implementation of the survey.

Some schools segregate Els and/or immigrant students by design. These schools can create a safe environment where Els feel better able to participate in academics and develop their own identity (Harklau, 1994a; Patel, 2012). Patel (2012) profiles students attending Franklin, a public international high school designed to educate recent immigrants. So called "newcomer schools" are perhaps the most segregated setting an El can encounter, but also the most likely to be structured to meet the needs of Els who are recent immigrants. Students attending Franklin High School were able to take up to 6 years to pass their standardized exit exams and graduate, allowing students more time to both acquire a new language and master high school content. Besides being trained to teach ESL, most of the teachers were bilingual and many were immigrants, giving them both skills and a personal connection that could aid them in supporting students. The explicit mission to serve Els and their isolation from NESs allowed students to feel more comfortable. One student explained why she favored Franklin over her neighborhood school saying, "And here, everybody is like me cuz they are from another country. So nobody makes fun of me for having an accent. I talk more here, so my English gets better here" (Patel, 2012, p.4).

Despite the findings above, most research has found that high concentrations of minority or disadvantaged youth in a school is correlated with low academic achievement. Schools with high concentrations of minority or disadvantaged students tend to have fewer resources, less qualified or experienced teachers, and higher teacher and principal turnover (Ingersoll, 2011; Rothstein, 2004; Kozol, 1991; Gandara & Contreras, 2009). Adults in these schools tend to have lower expectations for minority and disadvantaged students, and these expectations are often translated into less rigorous course work and lower achievement (Jussim & Harber, 2005; Rosenthal & Jacobsen, 1968).

Many studies find that socioeconomic status, and not race, ethnicity, or linguistic proficiency, accounts for negative academic outcomes in schools that enroll a high population of minority students (Ellen, Regan, Schwartz, & Steifel, 2001; Southword, 2010; Ryerbov, et al, 2007). For instance, Ellen and her colleagues (2001) find the impact of segregated school contexts on academic achievement is driven by the socioeconomic status of the student. In their study of immigrants in New York City, they find that while Russian immigrants are highly segregated between schools, they attend higher SES, lower racial minority schools with more experienced teachers. In contrast, Dominican immigrants, who were also segregated across schools, attend mostly low SES, high minority schools with less experienced teachers and perform less well than the Russian students.

Within-school segregation. Unlike de jure race-based segregation between schools, which is illegal and nearly universally decried, there are conflicting views about the merits or disadvantages of separating students within schools because of perceived intellectual or academic needs (Faltis & Arias, 2013; Reeves, 2004). Reflecting these conflicting views, two dueling philosophies exist for how to best structure programs that differentiate instruction for English learners: inclusion or separation (Platt, Harper, & Mendoza, 2003; Rios-Aguilar, et al., 2010). In inclusion settings, Els are exclusively educated in the same classrooms as NESs. In these cases, the teacher either differentiates instruction for Els or there is a co-teacher within the classroom tasked with scaffolding instruction for Els. In separated settings, Els receive targeted language support or content instruction in classrooms with other Els.

Whether Els are included or separated can be determined by several factors, including the school El population or teacher capacity to support Els. To a certain extent, the type of English language development (ELD) program being implemented by a particular school will constrain the potential exposure Els have to NESs. ELD programs are broadly categorized as either bilingual or English immersion programs. Table A1 in the Appendix A shows the characteristics of the most common English language development programs used in schools (see Rolstad, et al., 2005, for more detailed information regarding each program type).

The extent to which a school practices formal or informal academic tracking will also impact the classroom composition of Els. Academic tracking refers to the practice of segregating students into different classes according to their prior achievement or perceived ability (Oakes, 1986). High track classes tend to be more academically rigorous and enroll higher achieving students, whereas low track classes are less academically rigorous and enroll lower achieving students. Els who have not yet reclassified as English proficient are more often than not low-achieving students; thus, if a school has a strong academic tracking system, Els are likely to find themselves in the same classroom as other Els or with other low achieving students.

The composition of the school itself will also have a heavy influence on the level of exposure an El will have to NES. For instance, in a school where there are few Els, it is highly unlikely or even impossible for Els to be segregated from NES for most of their day.

Regardless of whether or not segregating Els from NESs is justified for academic reasons, there is evidence that this type of segregation does occur (Conger, 2005; Faltis & Arias, 2013). Conger (2005) measured within-school segregation by race, class, and immigrant status in New

York City elementary schools in 1995-96 and 2000-2001 using the exposure index (a measure that gives the probability that one type of student will encounter a different type of student in their classroom or school). She finds that segregation by nativity is different than segregation by race or class. Segregation by race and class is much more severe between schools than within schools, but this trend is reversed when measuring segregation of foreign-born from native-born students. Foreign-born students are much more likely to be concentrated in particular classrooms within a school then particular schools within the city.

Positive repercussions of within-school segregation of Els. There are potential advantages to separating Els from NESs for instructional purposes. In a separate setting, Els may be more likely to receive specialized support from a trained ESL teacher, whereas several qualitative studies have documented how mainstream teachers (those without specialized training to teach Els) are not willing or capable of differentiating instruction for Els (Becker, 1990; Harklau, 1994a; Hincken, 2006; Reeves, 2004; Platt, Harper, & Beatriz Mendoza, 2003; Walker, Shafer, Iiams, 2004). Platt and her colleagues (2003) interviewed 29 district leaders in a Florida school district to understand how they perceived ELD programs that either segregated Els or included NES students. They found a wide variety of responses, however about 57% of administrators favored segregating Els for instructional purposes. One administrator explained that she was reluctant to move towards an inclusive program for Els because students taught by mainstream teachers “don't get nearly what they get with ESL teachers” (Platt, et al., 2003, p120).

While Els in mainstream classes may be more likely to be exposed to grade level, rigorous content, they may not benefit from that exposure. One study found that Els in an inclusive mainstream algebra class experienced less opportunity to learn, defined as how much content was covered throughout the year, than their English proficient peers in the same classroom. The difference arose not because Els were receiving different instruction, but because they were unable to understand teacher's directions or instruction throughout the year (Abedi & Herman, 2010). In this case, Els might be better served in an environment where teachers explicitly scaffold instruction to support language acquisition.

Along with access to special teachers, Els in separated classroom environments might also have increased access to comprehensible input and special resources. In Harklau's studies comparing inclusive and segregated classrooms (1994a; 1994b), the ESL teacher of the segregated classroom had procured books at different reading levels, books adapted for Els, and books representing the cultural and ethnic backgrounds of her students. In contrast, the reading materials in the inclusive classrooms were more likely to be on grade level and not adapted to support comprehension (e.g., by having simpler grammatical phrases, picture cues, or glossaries of terms).

A special case of a segregated setting is the bilingual classroom. While dual-immersion models allow for settings that integrate NESs and Els, other common bilingual programs (e.g. developmental, transitional) are specifically designed to help Els learn English in a settings where NESs are excluded (NC DPI, 2014; Roberts, 1995). Proponents of bilingual models believe that the benefits of segregating Els in order to facilitate instruction in the student's home language outweigh the potential negative repercussions, described in detail below (Platt, et. al, 2003). Several large scale meta-analyses have been conducted over the last 30 years, suggesting that bilingual programs result in English and native language proficiency (Greene, 1998; Rolstad, et al., 2005; Willig, 1985), and at the very least do not impede the development of English skills (August & Hakuta, 1997). In a recent review, Goldenberg (2008) points out that after five major meta-analyses of research comparing bilingual settings to English only settings, all agree that use of students' first language facilitates and aids academic achievement. Further, the Supreme Court Justices' ruling in the *Casteñeda vs. Pickard* (1981) case stated that segregating Els in order to provide bilingual services was allowable because "the benefits which would accrue to [Els] by remedying the language barriers which impede their ability to realize their academic potential in an English language educational institution may outweigh the adverse effects of such segregation".

Negative repercussions of within-school segregation of Els. For all the benefits of segregated classrooms for Els described above, there are as many disadvantages, which include those that inhibit language acquisition as well as those that reify existing racial and social class boundaries. One advantage of educating Els in inclusive, mainstream settings is that students will have access to English speaking peers who can serve as models for what English sounds like. According to second language acquisition theories grounded in sociocultural frameworks, language is a tool for social interaction and language acquisition is a social process shaped by the learner's environment. Krashen's Input Hypothesis (1982) posits that language learners must have direct contact with the new language that is comprehensible in order for second language acquisition to occur. Building on this theory is the Interaction Hypothesis (Long, 1996) that proposes that language acquisition occurs when language learners negotiate meaning with a more linguistically advanced other. Interaction scaffolds acquisition by providing learners with feedback and models of language use.

It should be noted that while both the Input hypothesis and Interaction Hypothesis suggest that English learners would learn English faster if exposed to language models, it is not a given that students in in a mainstream setting are willing or able to serve as those models. Antagonism towards English learners from NESs, or even more advanced English learners, has been documented in several ethnographic studies (Harklau, 1994; Valenzuela, 1999; Becker, 1992). Likewise, immigrant students often choose not to interact with native English speaking peers. In her ethnography of a high school composed of predominantly Mexican immigrant and Mexican-American students, Valenzuela (1999) finds that country of origin, time in the US, language proficiency, and generational status cleave students into different peer groupings that seldom interact even when in the same setting. In any case, inclusive settings allow an opportunity for interaction that is impossible in segregated settings.

Els are often sorted into low track classes based on both their English proficiency and academic achievement. First, ESL classes are remedial in nature and so El-only classes can be considered similar to content area low-track classes. When Els are placed in these classes, they are likely to be surrounded by peers who are also learning English and who are probably low achieving. Next, Els who are still learning English and those who reach proficiency in English and exit the ELD program are likely to be placed in low track content-area classes (Callahan, 2004; Kanno & Kangas, 2014). Findings from a recent case study of Els in a suburban high school suggest that school structures, teacher opinions, and student and parent disengagement were related to Els' placement into low track courses (Kanno & Kangas, 2014). Because track placement was determined largely by achievement on standardized assessments, low achieving Els were barred from access to courses in the higher tracks. Teachers and other adults encouraged Els not to enroll in high track classes as a way to protect them from potential failure. Finally, Els and their parents in the study were not empowered to make or change decisions in the school, and so generally acquiesced to their placement. The authors conclude that even when students exit El status, they are generally placed in low track classes and seldom able to make their way to higher track courses.

Several studies have described in detail the differences between high and low track classes and the impact placement in one track or the other has on academic outcomes (Argys, Rees & Brewer, 1996). In an ethnographic study of twenty-five middle and high schools, Oakes (1985, 2005) found that compared to high track classes, low track classes were disproportionality populated by minority children, were less rigorous, exposed children to fewer concepts and topics, and allowed for less opportunity for collaborative work. Children in low track classes were also treated differently than those in higher track classes. Teachers of low track classes were more authoritative and were constantly battling students for control, whereas in high track classes teachers emphasized mutual respect and personal autonomy. The results of the more authoritative approach to discipline was less time for teaching and learning, and fewer opportunities for students to collaborate or construct meaning with the teacher or with each other. Oakes states clearly,

> Tracking seems to retard the academic progress of many students—those in average and low groups. Tracking seems to foster low self-esteem among these same students and promote school misbehavior and dropping out. Tracking also appears to lower the aspirations of students who are not in the top groups. And perhaps most important, in view of all the above, is that tracking separates students along socioeconomic lines,

separating rich from poor, Whites from non Whites. …[Students in low-tracks] are likely to suffer far more negative consequences of schooling than are their more fortunate peers (p.40).

Low track settings can have an especially pernicious impact on linguistic minority students. Callahan (2004) used data from a California high school with a large (35%) proportion of Els to study how El status (i.e., recent immigrant who had missed a year or more of schooling prior to enrolling in study high school, recent immigrant with uninterrupted prior schooling in their native country, and Els who had not been reclassified after 7 years) and track level interacted and were related to academic achievement as measured by grades, standardized achievement scores, and credits. She found that being placed in a lower track, rather than El status or language proficiency, had a greater impact on the academic achievement of long-term Els. In explaining her results, Callahan points to the differences in pedagogy and curriculum in high and low class courses. In high track science classes, for instance, students worked in groups to conduct experiments whereas in low track science classes students typically listened to lectures and completed bookwork. Thus, in addition to not being exposed to challenging and engaging materials, Els in low track classes had fewer opportunities to negotiate understanding, receive feedback, and practice English.

Finally, one purported advantage of segregated settings is that Els will have access to teachers with specialized ESL training. Yet there is very little evidence supporting the benefits of a specialized teacher teaching a homogenous group of Els, and so access to a specialized teacher may not justify segregating Els from NESs. Several authors note that in ESL courses, ESL teachers sometimes hold lower expectations for their students than in mainstream classes

(Harklau, 1994; Reeves, 2004; Platt 2003). In the name of differentiation, ESL teachers may reduce workload and give other accommodations to Els without increasing the rigor over time.

Table 2 summarizes the potential advantages and disadvantages of segregating students within schools.

Table 2 ***Summary of the Advantages and Disadvantages of Within-School Segregation.***

	Segregation	Inclusion
+	- Access to specialized teachers and curricula - Safe environment - Strong co-ethnic community - Access to comprehensible input (Becker, 1990; Harklau, 1994a; Hinkcen, 2006; Patel, 2012; Portes & Zhou)	- Access to language models - Teachers have same expectations of Els as they have for all students (Krashen, 1982; Long, 1996; Reeves, 2004)
-	- Classes are less rigorous - Teachers lower expectations (Callahan, 2004; Oakes, 2005)	- Students might not understand instruction - Students face more discrimination (Abedi & Herman, 2010; Becker, 1990)

Conclusion

It is an open question as to how segregation from native English speakers impacts the achievement of Els. Confusing the findings in the studies cited above is the interrelationship between race, class, and linguistic minority status. Additionally, it is unclear whether Els are being segregated from NESs in order to receive special resources, because of their previous academic achievement, or for other reasons unrelated to their linguistic proficiency. Contextual factors within the school as well as a student's own background may confound any relationship between segregation and achievement.

Finally, most of the studies cited above were conducted within one school or one district, limiting the generalizability of their findings. For instance, the Callahan (2004) and Harklau (1994a, 1994b) studies, which give the clearest descriptions of how Els experience schools, are both conducted in single high schools in California, the state with the highest proportion of Els in the country. Oakes' (2005) and Conger's (2005) studies cover larger areas, but do not focus specifically on the experiences of Els. The exceptions are the studies using data from the nationally representative ADD-Health Survey (Callahan et al, 2008a, 2008b); however, the analytical sample used in these papers only include a small number (less then 30) of high schools and the findings do not provide any information on the contexts of elementary or middle schools. Thus, the extant research suggests what might be occurring for Els in schools across the country, but leaves room for further investigation.

What is the Current Condition of the ESL Teacher Workforce?

Beyond the characteristics of the other students in classes with Els, the characteristics and qualifications of the teacher may impact the academic outcomes of Els. Across the country, Els are taught by certified ESL teachers, trained mainstream teachers, and/or untrained mainstream teachers. I define ESL teachers as any teacher who has completed the requirements to earn an ESL credential. A trained mainstream teacher is one who may have received pre-service training or professional development related to teaching Els, but who has not completed the requirements to receive a credential. An untrained mainstream teacher is one who has not had any formal training related to teaching Els.

There is a large literature base describing characteristics of the teacher work force (e.g. age, years of experience, and number of teachers), how those characteristics are related to student achievement, and how teachers with different characteristics are distributed across schools (Aaronson, Barrow, & Sander, 2007; Loeb & Beteille, 2008; Lankford, Hamilton, Loeb, & Wyckoff, 2002; Ladd, 2008; Kane, Rockoff, & Staiger, 2007; Clotfelter, Ladd, & Vigdor, 2007).

Few researchers, however, have specifically investigated the characteristics of ESL teachers or mainstream teachers of Els. Most studies focused on ESL teachers document teacher attitudes and beliefs, including their perceptions of their preparation, working conditions, and their sense of efficacy for teaching Els, but do not quantify how these factors are related to El achievement. Additionally, qualitative studies and policy reports suggest a shortage of adequately prepared teachers for Els (Wainer, 2006), but it is unknown how accurate these sentiments are or how pervasive the problem might be at a broader scale. In the sections that follow, I describe what we know about the current state of teacher preparation for working with Els as well as the characteristics of effective ESL teachers.

Preparation. Research related to second language acquisition, socio-cultural theory, linguistics, and child development generally converges on the fundamental knowledge and skills necessary to support English learners in learning both content and English as second language (Genesee, 2005; Ballentyne, 2008; Tellez & Waxman, 2006; Goldenberg, 2008; Webster & Valeo, 2011; Lucas, 2011). Table 3 summarizes the skills and knowledge that researchers believe are most important for the teachers of Els (see Ballentyne, 2008 or Lucas & Villegas, 2011 for an extended description).

Because mainstream teachers are very likely to teach an El during their career, scholars and educators have advocated that all teachers demonstrate the skills and knowledge listed below (Tellez & Waxman, 2006; Villegas & Lucas, 2011). The majority of teacher preparation programs, however, do not offer specific degrees in teaching Els, and less than half of these programs require even a single class on educating culturally and linguistically diverse students (Menken & Antunez, 2001; Morrier, 2007). The majority of states do not require that ESL or mainstream teachers demonstrate competency in ESL methods, curricula, or assessment; and, only 21 states ask that teachers participate in a student-teaching experience in a bilingual or ESL setting (Lopez, 2013). Furthermore, only half of states require that teachers obtain a special

Table 3 ***Essential Knowledge and Skills for Teachers of Els***

Knowledge	Skills
Linguistics Teachers need to know how English is structured and used. Important linguistic knowledge includes grammar, syntax, morphology, and semantics.	**How to Differentiate Instruction** Teachers need to be able to differentiate instruction for students at varying levels of proficiency in the four language domains as well as in content mastery. Teachers should be able to scaffold instruction by providing comprehensible input.
Second Language Acquisition Teachers need to know the process of second language acquisition and the factors that impact the rate of learning. Teachers should understand the differences between academic and conversational English, the role of interaction in promoting language acquisition, the need to provide comprehensible input, how first and second language acquisition is similar or different, how the first language knowledge can promote second language learning, and how anxiety hinders language development.	**How to Create and Adapt Assessments** Teachers need to know to develop content area assessments that are appropriate for different stages of language development, how to identify and alter the language demands of content area assessments, and how to assess proficiency and growth across the four language domains.
Sociocultural Theory Teachers need to understand how language is used as a tool for social interaction and relationship between language, culture, and identity.	**How to Communicate** Teachers must be able to interact and collaborate with culturally and linguistically diverse students, parents, and stakeholders.
Cultural competence Teachers need to understand the diverse backgrounds of students and understand how background shapes the learning process.	**How to Collaborate** Teachers must be able to collaborate with non-ESL teachers to provide adequate instruction and ensure that the needs of Els are being acknowledged and met in all school settings.

certification to teach Els and only 20 states require that mainstream teachers take any courses related to teaching linguistically diverse students (Lopez, 2013). Being certified by no means guarantees that a teacher will be more effective with her Els; however, teachers with certification at least have been exposed to the foundational knowledge recommended for teaching Els

Unsurprisingly, given the minimal requirements for working with Els, Els are typically taught by mainstream teachers who, in addition to not having pre-service training, do not typically participate in professional development related to teaching Els (Gandara, et al, 2003). According to the most recent Schools and Staffing Survey, only about 27% of teachers received any professional development related to teaching English learners in the 2011-12 school year. In contrast, 85% participated in content related professional development, 67% participated in professional development related to technology use, and 43% participated in professional development related to classroom management (NCES, 2011). Even those who received El-related professional development are likely not to feel prepared, as teachers report that professional development regarding teaching Els is too brief, of poor quality, or not aligned with their needs (Gandara, 2005; Gandara, Rumberger, Maxwell-Jolly & Callahan, 2003).

Studies in both urban and rural contexts indicate that teachers desire more training in how to support Els (Batt, 2008; Pettit, 2011; Reeves, 2006; Webster & Valeo, 2011). In her study of a purposeful sample of 161 rural teachers and school professionals who have a high degree of contact with Els, Batt (2008) found that the greatest challenge to teaching Els was a lack of understanding of how to teach El students, lack of certified or trained ESL teachers, lack of support from mainstream teachers and school administrators, and a lack of time to complete administrative tasks (including filling out paperwork, translating documents, or interpreting for parents). Several teachers indicated that the frustration caused by a lack of sufficient time for preparation induced them to consider leaving their position or leaving teaching altogether. Batt (2008) also analyzed practitioner recommendations for restructuring schools to better meet the needs of Els and found that 75% of the practitioners wanted schools to hire more certified ESL/

Bilingual teachers and 41% wanted an increase in professional development regarding ESL strategies.

Batt's study highlights the perceptions of El teachers in rural environments. Unlike in more urban environments that may have higher rates of Els and thus more funding, teachers in rural communities have fewer supports (Barnes, et al., 2008; Gandara, Maxwell-Jolly & Driscoll, 2005) and need additional professional development around teaching Els in order to build a more manageable work environment. Teachers in rural areas that do not have a long history of receiving immigrants might also need additional professional development around cultural awareness. In a qualitative study of teachers' attitudes in a rural community in the Midwest experiencing rapid demographic change, teacher attitudes became more negative as the population of Els increased in the schools (Walker, Shafer, & Liams, 2004). Teachers were particularly negative towards teaching migrant students, who some participants perceived as coming from families who did not value education.

In another mixed methods study, Reeves (2004) analyzed data collected from a survey of 279 teachers and interviews of 16 teachers to investigate the attitude of general educators toward the inclusion of Els in the mainstream classroom and their desire for professional development regarding Els. The results indicated that teachers believed that Els should not be included in the mainstream classroom without achieving a minimum level of English proficiency. The teachers also reported that they did not have enough training to effectively work with Els. This study provides insight into how mainstream teachers perceive the inclusion of Els and evidence that teachers believe that serving Els requires a different set of skills than working with English proficient students.

Even teachers who are trained to work with culturally and linguistically diverse students often feel ill prepared to teach Els. Durgunoğlu and Hughes (2010) collected survey responses from 62 pre-service teachers being prepared to work with diverse students and observed 4 of these teachers during their pre-service training. The descriptive results from the survey indicated that the pre-service teachers felt that they were prepared to teach. However, on survey items that tested teacher's knowledge of ESL pedagogy, teachers' mean score correct was only 25%. Classroom observations of the four teachers revealed that pre-service teachers tended to interact infrequently with Els and that they received no support from mentor teachers. In follow up interviews, these teachers were not aware of the evident disengagement and lack of comprehension expressed by the El students. In this study, there was only 1 El student in each teacher's classroom, and so each student may have been easier to neglect or miss.

There are several studies that go beyond documenting what skills teachers possess or require and instead portray differences in classrooms taught by ESL and mainstream teachers. In her ethnographic studies of Chinese Els in California, Harlkau (1994a, 1994b), found that mainstream teachers did not alter their speech to facilitate comprehension, rarely called on Els or elicited speech from these students, and often asked for only single word or short answers in written responses. Mainstream teachers did not have the linguistics background to diagnose common grammatical errors made by Els, and so the teachers would make general remarks on the students' papers, such as telling them to re-read to fix grammatical mistakes (Harklau, 1994b) or to work on "usage" (Harklau, 1994a, p.261).

Mainstream teachers express being uncomfortable treating Els differently than NESs. In one study documenting mainstream teacher perceptions, teachers were reluctant to adapt curriculum or instructional techniques in their classrooms in order to support Els' language acquisition because they felt differentiation meant they would not be treating all of their students equally (Reeves, 2004). Teachers were more likely to make procedural accommodations, such as allowing students extra time to complete assignments or the use of a bilingual dictionary[6] to complete assignments, instead of curricular or pedagogical changes. One of the case study teachers refused to allow students to use their first language in school and actively discouraged them from using their first language at home, indicating lack of knowledge of commonly accepted second language acquisition theories (Cummins, 1979, 1981). Another teacher in this study explained that she believed Els should not receive any special curricular or instructional accommodations because at the end of the year they would have to take the same exam as everyone else. Thus, teachers' ignorance or misunderstandings of second language acquisition theories shaped their expectations and perceptions of Els as well as the way they taught these students (Reeves, 2004).

While providing a portrait of the working conditions of El teachers, the qualitative studies cited above (Batt, 2008; Durgunoğlu & Hughes, 2010; Harlkau, 1994a, 1994b; Reeves, 2004; Walker, Shafer, & Liams, 2004), share the following limitations: they are based on non-representative, non-random, and relatively small samples of El educators and they rely on descriptive or case study analysis that do not control for teacher or school characteristics. Moreover, none of these studies looks specifically at the question of whether teacher characteristics, knowledge, or perceptions are related to El achievement.

[6] A bilingual dictionary provides translations between words in a student's native language and English. Typically, it does not provide definitions of words.

Teacher effectiveness for Els. The studies conducted by Harklau (1994a, 1994b) and Reeves (2004) cited above indicate there may be important differences in how ESL and mainstream teachers differentiate instruction to support the Els' language development. Unfortunately, they do not describe what training, characteristics, or experiences distinguished ESL and mainstream teachers in their studies. In general, research on teachers of English learners has provided a framework for what teachers should know and be able to do, but has not tested the relationship between specific teacher characteristics or behaviors and student achievement on a large scale. The broad literature on teacher effectiveness can offer some insights into the teacher characteristics, including teacher credentialing, experience, educational background, and individual characteristics, which might make a difference for El achievement.

Certification*.* Teachers can be certified to teach particular content areas (e.g., math, science, or social studies), grade levels (e.g. elementary or secondary grades), or special populations (e.g. Els, deaf students). Typically there is a continuum that defines the level of certification, from no certification, to emergency, provisional, standard, and continuing certification. Teachers can follow either a traditional or alternative route to certification. In most states, teachers who obtain a traditional certification graduate from an accredited undergraduate or graduate program in education; pass a general teaching knowledge exam in the areas of reading, math, and writing; and then received additional training and/or pass additional exams in order to receive a credential to teach a particular content area or special population. Teachers receive an alternative a credential by participating in alternative teacher preparation programs such as Teach for America or city Teaching Fellows programs.

Many studies have investigated the relationship between the level of certification (e.g. regular versus emergency certification), route to certification (traditional or alternative), and student achievement (Marzalek, Odom, LaNasa, & Adler, 2010; Kain, Rockoff, & Steiger, 2008; Clotfelter, Ladd, & Vigdor, 2007, 2010; Hightower, et al, 2011; Cochran-Smith, et al, 2012; Leak & Farkas, 2011; Henry, et al, 2014; Goldhaber & Brewer, 2000). Results from these studies are generally mixed, with results heavily dependent on the context of the study and empirical strategy applied by the authors (Hightower, et al, 2011; Cochran-Smith, Et al, 2012; Leak & Farkas, 2011). For instance, Clotfelter and his team (2007) study the impact of various teacher characteristics on student achievement using 10 years of data on students and teachers in grades 3-5 in North Carolina and find that there is a significant and positive relationship between a teacher holding a regular certification and student achievement. Kane, Rockoff, and Steiger (2008) conduct a similar study using data from New York City. While Clotfelter and his colleagues distinguished between regular, lateral entry, and other certifications, Kane and Steiger further disaggregated types of certification to include traditional certified, not certified, international teachers, teachers certified through the New York teaching fellows and those certified through Teach for America. The authors find that although traditionally certified teachers had a positive effect on student achievement in when compared to international teacher or those without a certification at all, their productivity in raising student achievement was less than teachers who had an alternative certification.

Most research examining the relationship between teacher credentialing and student achievement focuses on teachers who do not teach special populations, such as English learners or students with special needs. One exception is a recent study conducted by Feng and

Sass (2013) that focuses on the teachers of special needs students. Using five years of student and teacher data from Florida and controlling for a multitude of school and student characteristics, including prior achievement, the authors find a positive and significant relationship between a teacher having a special education certification and reading and math achievement gains for special needs students. The authors find that other measures of pre-service training in special education, such as hours of coursework, also have a significant and positive relationship on student achievement. While the findings of this study are limited because the authors do not include controls for unobserved variables that may be related to the sorting of special needs teachers into different classrooms, the study supports the idea that certification may matter with special populations of students.

Teachers generally gain an ESL certification in addition to a regular content area or grade level credential. Lopez and her colleagues (2013) used a hierarchical linear model to assess the relationship between state requirements for ESL teacher preparation and credentialing (i.e., requiring a specialist certification or requiring an undergraduate course on ESL strategies) and 4th grade Latino El achievement using 2009 NAEP reading scores. The authors' empirical analysis showed that Els in states that require teachers to hold a specialized certification tend to perform better than those in states where there is no such requirement. This study is potentially biased, however, as the authors do not have access to data linking students to their teachers, classrooms, or schools and so they were unable to adequately control for individual or contextual factors that might be related to student achievement and they cannot control for the variables related to states' decisions to adopt such requirements.

Darling Hammond and her colleagues (2005) used OLS regression to analyze the relationship between teacher credentials and student achievement using a longitudinal data set that included all students and teachers in the Houston Independent School District from 1995-2001. Because Texas allows Spanish-speaking Els in grades 1-9 to take state mandated standardized achievement tests in Spanish until they reach a certain level of English proficiency, the authors were able to investigate how teacher certification was related to the achievement of Spanish-dominant English learners. They found that alternatively certified teachers had the most positive impact on these students, and that uncertified teachers had an even more negative impact on the achievement of Spanish-dominant students than English-proficient students. They posit that the positive correlation between alternative certification and Spanish reading achievement might be explained by the high proportion of Spanish speaking teachers who take part in the alternative certification program in the Texas setting. They also hypothesize that the negative impact of non-certified teachers on Spanish dominant student achievement is likely because teachers need specific knowledge and skills to teach Els and non-certified teachers are less likely to have gained these skills on their own. This study, however, does not examine the relationship between teachers who hold an ESL or Bilingual certification and student achievement.

Two recent studies suggest that in certain contexts, a credential in either ESL or Bilingual education is correlated with increased El student achievement. Master and his colleagues (Master, Loeb, Whitney, & Wyckoff, 2012) use longitudinal data from New York City to estimate a teacher fixed-effects model that distinguishes the effectiveness of individual teachers for improving outcomes for both their El and non-El students. Loeb and her colleagues (forthcoming) also found differences in teacher effectiveness for Els and NESs using a value-added model. However, the results of these studies should be interpreted with caution because New York City and Florida are unique and traditional destination contexts with regards to their immigration history and immigrant population.

Experience. Experience in the classroom is one of few teacher attributes consistently shown to be related to student achievement gains (Harris & Sass, 2011; Steiger & Rockoff, 2010; Cloftfelter, 2010). New teachers experience the most growth in effectiveness in the first two years of teaching and returns to experience generally taper by a teacher's 5th year (Henry, Bastian, & Fortner, 2011; Kane, et al, 2008). On average, while teachers with 20 years of experience are more effective than first year teachers, they are not more effective than 5th year teachers (Rice, 2010). Further, one study found that high school math teachers with more than 25 years of experience were less effective in raising achievement than their colleagues with fewer than five years of experience (Ladd, 2008). In sum, studies suggest that all experience is not equal and that simply being in a classroom for more years is not a guarantee that a teacher will be more effective in raising their students' test scores.

The number of years of experience a teacher has specifically teaching Els can have positive or negative repercussions on El achievement. Master and his team (2012) find that a teacher's total years of experience does not have a differential impact on the achievement Els compared to non-Els. However, experience teaching Els not only predicts higher achievement for all students; it has an even stronger impact on the achievement of El students. The authors operationalized "experience teaching Els" as having taught 6 Els in any given year she was included in the data. Future studies should investigate whether alternative measures of experience, such as having taught at least 1 student, or year of experience teaching a certain number of students, produce similar results.

Educational background. Another facet of teachers that has received attention by the research community is their educational background, which includes performance on aptitude exams in high school (i.e., SAT and ACT), performance on teacher entrances exams (i.e., PRAXIS), the quality of the undergraduate or graduate institution, undergraduate and graduate course work and grade point average, and highest degree earned (Hightower, et al, 2011). The basic assumption undergirding these studies “smart” teachers are good teachers.

Studies focusing on mainstream teachers have found some significant relationships between educational background and student achievement. Ferguson (1991) analyzed the impact of educational background of a large sample of teachers on the achievement of children across the state of Texas and found that the largest single predictor of increased achievement was performance on the Texas teacher licensure exam. More recent studies indicate mixed results. Rockoff, Jacob, Kane, & Steiger use data collected from a survey of new math teachers in New York City in 2006-2007 to model relationship between the SAT exam, other tests of cognitive ability, whether a teacher passed their certification exam, college selectivity and 4-8th grade student achievement in math (Rockoff, Jacob, Kane, & Staiger, 2008). They find that none of these indicators of cognitive ability are significantly related to achievement gains. Clotefelter and his colleagues (2007) find slightly different results in their study using 10 years of data and models that include student or teacher fixed effects. The authors conclude that while the selectivity of a teacher’s undergraduate institution is marginally related to student achievement and having a master’s degree is unrelated to student achievement, a teacher’s licensure exam test scores are positively and significantly related to student achievement in math across all of their models.

Reviews of literature conclude that the only consistent relationship between coursework at the undergraduate level and student achievement in a particular subject is for secondary math and science teachers who have had relevant math or science coursework (Hightower, 2011; Goe, 2007). Additionally, Feng and Sass (2013) find a positive relationship between various measures of pre-professional training and the achievement in math and reading of special needs students.

Some studies suggest that having a post graduate degree is also a significant predictor of student achievement (Ferguson & Ladd, 1996). However, others conclude that results are mixed and dependent on the subject and grade level being taught (Henry et al, 2014). For example, Henry and his colleagues (2014) find that teachers who enter the profession with a master's degree are actually less effective at teaching middle school math and reading than teachers who hold only bachelors, but are more effective at teaching high school science.

The existing research specific to El achievement has found that pre-service and in-service training on particular strategies for educating Els has a positive impact on El achievement (Master et al, 2012; Loeb, et al, 2014). Unlike the findings from the Ferguson (1991) study of the mainstream teacher population, Master and his team found that that pre-service test scores on the LAST (Liberal Arts and Sciences Test) needed for certification in New York had no differential impact for El student achievement. Similarly, a study of the effectiveness of the SIOP (Sheltered Instruction Observation Protocol) English language development model found that students taught by teachers who participated in an extensive in-service SIOP training performed better on an expository writing task (Echeverria, Short, & Powers, 2010). The results from the SIOP effectiveness study should be interpreted with caution, however, as the teachers volunteered to participate in the study and the authors did not adequately control for selection bias.

Individual characteristics. Teachers are predominantly White, monolingual, and female (Cochran-Smith & Zeichner, 2005; Shen, 1997), and researchers have tried to uncover and explain the impact these characteristics have on minority students. Some demonstrate that minority teachers connect better with minority students (Flores & Clark, 1997). Minority teachers can act as cultural brokers between a minority student's home and the school, which can facilitate stronger home-school relationships (Stanton-Salazar, 2010, Marschall, Shan, & Donato, 2012). Evidence suggests that minority students prefer to have teachers of the same ethnicity and gender (Galguera, 2008). Using data form the Tennessee STAR randomized experiment, conducted originally to analyze the impact of class size on student achievement, Dee (2004) investigated whether student achievement is related to whether they are taught by same-race teachers. He finds that Black students perform better when taught by Black teachers, and that this positive relationship is strongest in schools that have a high concentration of Black students and low-income students. Clotfelter and his colleagues (2007) also found positive achievement gains for students who were taught by teachers of the same race.

Other evidence suggests there may be negative repercussions for minority students who are taught by teachers from different racial or ethnic backgrounds. An ethnography of a Texas high school with a predominantly Latino student body illustrates the cultural disconnect between the White, American teachers and students who were immigrants from Mexico or US born Mexicans. The study describes how this disconnect creates mistrust, resentment, and disengagement in the form of low achievement and drop-out (Valenzuela, 1999). Overall, studies analyzing the impact of teacher race do not adequately address whether it is a teacher's race or other characteristics of the teacher that explain differential achievement. For instance, Dee (2004) points out that teachers might be differentially assigned to teach minority students based on their race and other characteristics, and thus differential assignment could be confounding results.

Following the logic that minority teachers may be better equipped to teach minority students, both Master and his colleagues (2012) and Loeb and her collaborators (2014) tested whether teachers who speak Spanish are better able to increase achievement for Els. Speaking Spanish does not indicate that a teacher is a minority, and not all Els are from Spanish speaking backgrounds; nonetheless, the authors' intention was to model if cultural similarity between student and teacher might be related to academic achievement. The two studies are inconclusive on the impact of fluency in Spanish, the predominant language spoken by Els in public schools. In the New York context (Master, et al, 2012), language proficiency did not differentially predict El student achievement; however, in the Florida setting (Loeb et al, 2014), there was a positive relationship between Spanish fluency and El student achievement. These findings illustrate the importance of context: Florida has a more developed bilingual education system than New York City, and so Spanish fluency might be more important. The neutral finding in the study by Master and his associates may be more generalizable to other urban districts across the US where bilingual education is less common.

Master and his associates did uncover that a teacher's desire to teach Els before beginning of his or her career did have a positive impact on El achievement. This finding indicates the importance of perception and motivation for teacher success, and suggests that pre-service programs that help cultivate positive perceptions of El students among teachers may reap benefits for El student achievement. Additionally, it suggests the role of selection into particular teaching roles: teachers who want to work in a particular setting or with a particular population seem to be more effective than those who are teaching outside of their comfort or interest zone.

Conclusion

In sum, researchers know little about who teaches Els and what characteristics of these teachers are most important for El achievement. The essential take-away from the literature is that mainstream teachers are not being prepared adequately and generally do not feel prepared to accommodate the needs of Els in their classrooms. More troubling, it also seems that the teachers who are being trained to instruct Els also do not feel prepared.

The evidence available regarding teacher characteristics that are related to achievement is narrow and context specific. Not only do the studies focused on El teachers fail to test the impact of qualities that teacher educators have posited are most important, but they are also limited to contexts that are not particularly generalizable to the settings where a growing proportion of the El population is located.

How are Immigration Patterns Related to the Education of Els?

Defining new and traditional destinations. More than 12 million school age children speak a language other than English in the home, an increase from around 3.7 million in 2000, and this number is projected to surpass 17 million by 2020 (Whittenberg, 2011). In absolute terms, traditional immigrant destinations still have the largest share of recent migrants (Suro & Singer, 2002); however, the growth rate has been much higher in new destinations that previously had very small immigrant populations (Hall, 2012).

Increased settlement in new destinations is the result of emerging labor market conditions and federal and state policies, notably the Immigration Reform and Control Act (IRCA) of 1986 (Hirschman & Massey, 2008). Settlement in new destination areas persisted and grew as a result of a phenomenon called “chain migration”, which describes how social networks prompt migrants from different countries to settle in areas where established populations of co-ethnics already exist (MacDonald, 1964; Massey, 2010; Massey, 1993). Mexican participants in a qualitative study of migration to Marshalltown, Iowa, described how only about 1,000 of the 8,00 residents of their hometown of Villachuato, Mexico lived there year round, with the rest spending most of the year living and working in Marhsalltown (Grey & Woodrick, 2005). Chain migration prompts the development of ethnic enclaves, areas “where information on employment, housing, and other functional requirements is accessible and plentiful, and that provide a social environment rich in ethnic and linguistic resources that help ease the transition into the new land” (Hall, 2013, p.1876). These ethnic enclaves can serve an important function in helping immigrants adapt and assimilate to their new homes (Portes & Zhou, 1993).

When discussing both traditional and new immigrant destinations, states are too large a unit of analysis, and it is more appropriate to discuss immigration to towns, cities, or counties (Griffith, 2006). In new immigrant destinations immigrants have flocked to small towns and cities to work in manufacturing, food processing, and agriculture (Drever, 2006; Donato, Tolbert, Nucci, Kawano, 2008). When disaggregated to a smaller level, a particular geographic area may be a new destination for a particular immigrant population but a traditional destination for another (Hall, 2012).

Education of Els in new and traditional destinations. The largest modern wave of new immigrants to the US ended by the early 2000s. Since that time, many immigrants who arrived in the 1990s, who tended to be single men, have reunited with their families or have begun new families in the US leading to an increase in the number of second generation immigrant children needing ESL services in schools (Durand, Massey, & Capoferro, 2005; Shutika, 2005; Griffith, 2005). O'neal and Tienda (2010, p.730) explain the challenge many communities face in providing adequate services: "In the new immigrant destinations, immigration is neither a relatively familiar process (as it is in the traditional destinations) nor a distant abstraction (as it remains in much of the country), but a dynamic and challenging part of everyday life… [P]ublic and private institutions in these places are now compelled to serve an ethnically distinct and rapidly growing population segment".

Like Els in traditional immigrant destinations, in new immigrant destinations Els are predominantly Latino and Spanish-speaking. Most new immigrants are Mexican, although the most prevalent nation of origin differs across states and counties (Drever, 2006). There are also a substantial number of immigrants from Mexico and Central American countries who speak indigenous languages, such as Mixtec or Mayan dialects, which complicates the provision of services as they necessitate translators of low-incidence languages (Griffith, 2006).

Els in traditional destinations are more likely to be part of the second or third generations and thus better incorporated into the fabric of the existing community (Payan & Nettles, 2007). In contrast, Els in new destinations are more likely to be first or second generation immigrants, and so they, or their parents, are likely to be “younger, …have limited English skills, to earn lower incomes and to be undocumented” (Fix, Passel, & Velasquez, 2005). Because of their generational status, Els and their parents in new destination states are less likely to have the social and cultural capital that a large body of research has found is requisite for navigating and excelling in American public schools (Coleman, 1988; Bourdieu, 1977; Sattin-Bajaj, 2011). Some research finds that new destinations tend to have more undocumented immigrants than traditional destinations (Marrow, 2011; Hooker, Fix, & McHugh, 2014), which can have a profound effect on students daily lives and access to post-secondary education.

In new destination areas, Els are more likely than Els in traditional destinations to live in rural communities or in the suburbs (Johnson & Lichter, 2008; Fry, 2010). Differences in where immigrant families settle have important ramifications for students, as resources are not distributed evenly across specific areas. Drever (2006, pp. 20) explains, “just as immigrants themselves are not evenly distributed throughout the landscape, there is also a geography to where immigrants with more and less human capital settle. Further, different places provide different opportunities for upward mobility”.

Compared to schools in traditional destinations, schools in new destinations are “less likely to have the infrastructure in place that can meet the needs of the immigrant and LEP students such as networks for hiring bilingual teachers, or established curricula or assessment instruments” (Fix, et al., 2005, pp.11-12). Bohon, Macpherson, and Atiles (2005) conducted a series of focus groups with educators, parents, and community workers in districts across

Georgia, a new immigrant destination, to investigate the barriers to Latino immigrant student success. They highlight the following six barriers:

1. Lack of understanding of the U.S. school system,
2. Low parental involvement in the schools,
3. Lack of residential stability among the Latino population,
4. Little school support for the needs of Latino students,
5. Few incentives for the continuation of Latino education, and
6. Barred immigrant access to higher education (p.43)

Perhaps unsurprisingly, these mirror the barriers that have been found to stall Latino and immigrant academic achievement across the nation, including in traditional destination states (Gandara & Contreras, 2009; Rumberger & Gandara, 2004). One notable difference between the obstacles present in new and traditional destinations, however, is how race plays into assimilation and acceptance in the school system (Wainer, 2006). Studies have found that the influx of Latino students has disrupted a Black-White racial paradigm that exists in many new destinations (Griffith, 2005; Marchall, Shah, & Donato, 2012; Beck & Allexsaht, 2001; O'Neal & Tienda, 2010; Marrow, 2009). One Latino respondent explained that she felt like a non-person within the school community: "In Georgia there are Black people and White people. [Teachers] don't know what to do. You're not White, so they either treat you like you're Black, or they just ignore you" (Bohon et al, p 52).

Els in traditional destination states are 20% more likely than those in new destination areas to attend a linguistically isolated school (defined as a school in which the population of Els is over 30%) (Fry, 2006). This trend is likely because the population of Els is smaller in new destinations, making high concentration in any one school less possible. However, in new destination areas, the rate of Els attending linguistically isolated schools is still nearly 40% (Fix, et al., 2005) and children in new destination areas are more likely than those in traditional destinations to live in segregated, linguistically isolated neighborhoods (Hall, 2001).

The lower level of segregation from native English-speaking students between schools for Els in new immigrant destinations may mean these students have access to more resources and attend schools with more affluent peers. Dondero and Muller (2012) sought to gauge access to educational opportunities for Latino students and Els in both new and traditional destination states using data on 3,600 public schools from the NCES School District Demographic System. On the one hand, they found that students in new destinations on average attend schools that are more affluent and have a lower concentration of minority students. Schools in new destinations typically have more teachers that are certified in the subject area in which they are teaching. On the other hand, schools in new destinations tend to have less developed systems for identifying Els and offer fewer opportunities to learn English in a bilingual setting. Finally, the authors analyze the course taking behaviors of Latinos in new and traditional destinations and find that students are less likely to take higher level math courses in new destinations than their counterparts in traditional destinations.

How is Immigration Related to Schooling in North Carolina?

This study is situated in North Carolina, a new immigrant destination. Many researchers have been drawn to North Carolina because of its rapid demographic change and their studies, based primarily on qualitative interviewing, paint a picture of how North Carolina is changing and why research on the education of children in this state is important (Clotfelter, Ladd, Vigdor, 2012; Griffith, 2005; Kandel & Parrado, 2005; Mahon, 2007; Thomas & Collier, 2009, 2010; Whittenberg, 2011; Weeks, Weeks, & Weeks, 2007; Bacallao & Smokowski, 2009; Valencia & Johnson, 2006; O'Neal, Ringler, & Rodriguez, 2008; O'Neal & Tienda, 2010). North Carolina is an appropriate and interesting site for additional study for myriad reasons. First, it is a predominantly rural state. Currently, there is a dearth of research detailing how Els are educated in such areas. Given that one third of all US schools are located in rural areas and one fourth of all students are educated in rural areas (Keaton, 2013) it is imperative that research investigate issues of access and equity to ensure that students are not being denied opportunities simply because of where they live.

Second, North Carolina is a southern state, where the predominant narrative related to schooling has been focused on the segregation, desegregation, and resegregation of Black students from White students for at least 60 years (Ayscue, Woodward, Kucsera & Siegel-Hawley, 2014). Investigations into the educational lives of other groups of students are important in updating this focus to reflect the growing diversity of the school population.

Finally, North Carolina is growing and diversifying economically, as well as demographically (Frey, 2014). As a state, North Carolina has the 9th largest GDP and was ranked the 3rd best "State for Business" by Forbes magazine (Badenhausen, 2014). Thus, research situated in North Carolina can help document how and whether economic change is "lifting all boats"; that is, contributing to improvements in schooling for all students. In the sections below I detail patterns of immigration to North Carolina, and what we know about how immigration is related to the education of Els.

Immigration to North Carolina. According to the U.S. Census (Pandya et al. 2011), the immigrant population in North Carolina grew 274% from 1990 to 2000, a making it the fastest growing new destination state. From 2000 to 2010, the growth in the immigrant population slowed, and grew only about 65% (Grieco et al, 2012). These seemingly large increases in the percent of the population that is foreign born belie the fact immigrants are still a small minority group across North Carolina. In 1990 they made up around 1% of the population, and by 2010 that number had increased to a little over 8% (Clotfelter, Ladd, & Vigdor, 2012). Despite their small share of the population, rapid growth in the immigrant population has had profound effects on many towns, cities, and rural districts where even small changes have large repercussions (Chesser, 2012; Griffith, 2005).

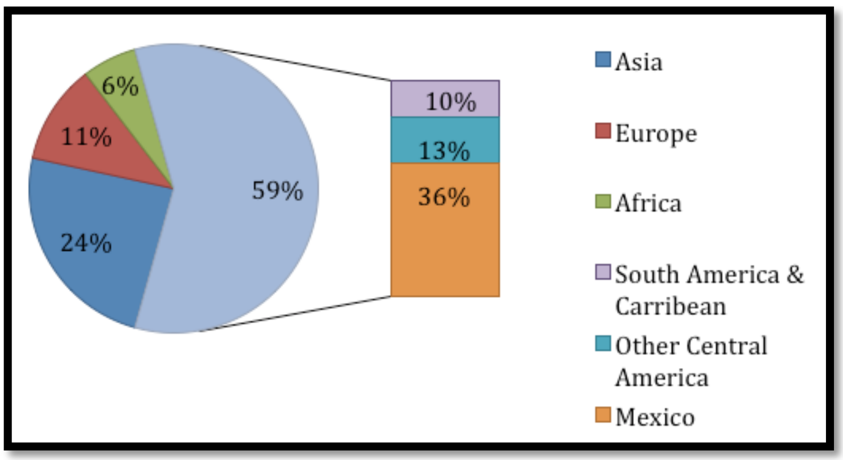

***Figure 1.* Pie graph showing the countries of origin of North Carolina's immigrants.**

Figure 1 illustrates the proportion of immigrants from different areas in the world. About 35% of the foreign born population in North Carolina is of Mexican origin. The next largest Latino immigrant groups in North Carolina originates in Central America; 4% of the originate in Honduras and 4% in El Salvador. The largest group of Asian immigrants originates in India (6%). Three percent of Asian immigrants come from China and 3% from Vietnam. The sum of the foreign born population comes from diverse nations around the world (US Census, 2011a).

The US Census (2010a) also describes the languages that immigrant groups speak at home. About 67% of the population that speaks a language other than English at home speaks Spanish and 12% speaks an Asian language. Speakers of different languages vary in their English language proficiency: 57% of Spanish speakers speak English less than very well, compared to 48% of Chinese speakers and 63% of Vietnamese speakers. Differences in the ability of not only children, but also adults, to speak English very well impact the relationship immigrant families might have with the school (Suarez Orozco et al., 2011).

Regional differences. North Carolina is a diverse state demographically and geographically. Differences across various regions of the state have shaped the flow of immigrants into and across North Carolina over time. Figure 2 shows the proportion of foreign-born people in each North Carolina counties. The foreign-born population is not evenly distributed across North Carolina's counties. Gates County and Bertie County, located in the upper East portion of the state, have a foreign born population of less than 1%. In contrast, the five counties with the highest proportion of foreign born residents each have a population that is over 12% foreign born.

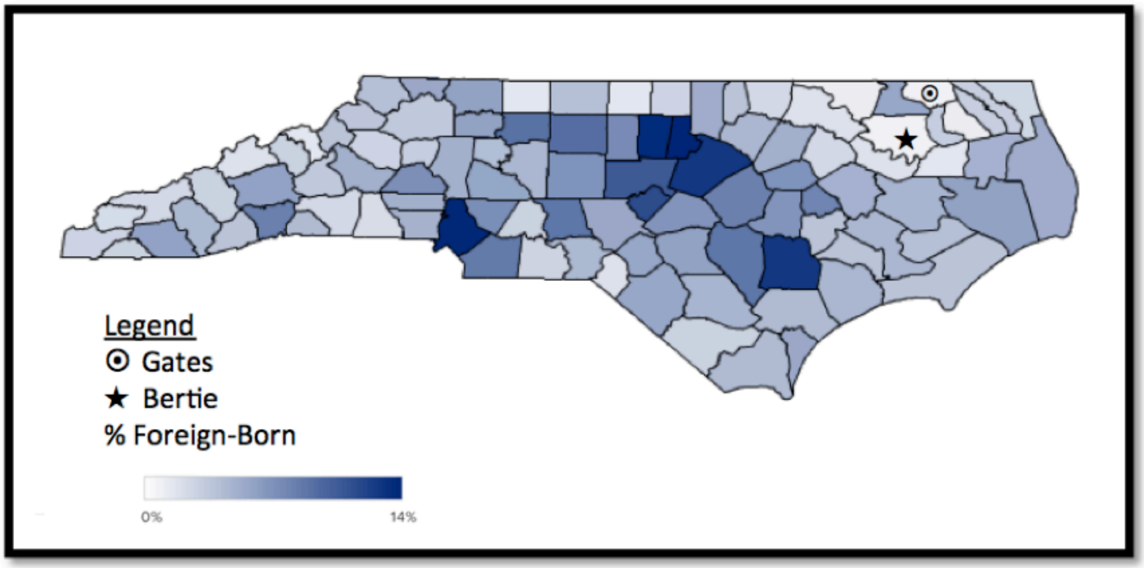

Figure 2. **Map showing percent of foreign-born population in each North Carolina county[7].**

Both available jobs and educational opportunities help explain settlement patterns. Table 4 lists the top employers in each of the five counties with the largest foreign-born population. Three of these counties – Wake, Orange, and Durham-- are part of North Carolina's Research Triangle. The Research Triangle is the home to three large research universities as well as the site of many high tech industries. This area has seen an influx of immigrants seeking both education and employment (Frey, 2014). Similarly, Mecklenburg County is a large urban center whose largest employers include two large banks. Indeed, Bank of America is headquartered in Charlotte, located in Mecklenburg County.

Duplin County, a rural county located in South Central North Carolina, stands in stark contrast to counties located in the Research Triangle and Mecklenburg County. Three of the 5

[7] Source: North Carolina Justice Center, 2007-2011 ACS estimates

largest employers in Duplin are poultry or pork processing plants, industries that have been major employers of new immigrant populations ("Major Employers in Duplin County", 2014).

Table 4 ***Largest Employers in Counties with the Largest Share of the Foreign-Born Populations***

County	% Foreign Born	Top 5 Employers	Industry
Durham County	14	Duke University	Education
		IBM Corporation	Manufacturing
		Durham Public Schools	Education
		Glaxosmithkline	Health Services
		Veterans Administration	Public Administration
Mecklenburg County	13.6	Charlotte Mecklenburg Hospital	Health Services
		Wells Fargo Bank	Financial Services
		Charlotte Mecklenburg Schools	Education
		Bank of America	Financial Services
		US Air	Transportation
Wake County	13.8	Wake County Public Schools	Education
		NC State at Raleigh	Education
		Wake Med	Health Services
		Sas Institute	Information Technology
		Rex Hospital	Health Services
Orange County	13.4	UNC Chapel Hill	Education
		UNC Health Care	Health Services
		Chapel Hill-Carrboro Public Schools	Education
		Orange County Schools	Education
		Orange County	Public Administration
Duplin County	12.7	Butterball	Food processing
		Smithfield Foods	Food processing
		Duplin County schools (Education);	Education
		House of Raeford	Food processing
		Murphy Family Ventures	Food processing

Source: North Carolina Justice Center, 2007-2011 ACS estimates; NC Commerce, Labor, and Economic Analysis Division (http://accessnc.commerce.state.nc.us/EDIS/business.html).

It is no surprise that the immigrant and EI populations in Duplin compared to say, Wake County, are quite different given their contrasting economies. Table 5 shows select characteristics of the foreign born population in both Duplin and Wake County. The differences in the educational attainment of adult immigrants across the two counties are striking. The overwhelming majority of immigrants in Duplin have not graduated high school, whereas in Wake almost half of the immigrant population has completed college or beyond (Figure 3) (US Census, 2011c). In fact, in Wake County, a higher proportion of immigrants have a graduate or professional degree than native residents (20% vs. 11%). The differences in education and employment, noted above, are related. Universities and health providers in the Research Triangle attract highly educated immigrants from around the world, whereas the food processing plants in Duplin tend to attract less educated low-skilled immigrant workers.

Table 5 ***Differences in the Immigrant Populations of Wake and Duplin Counties***

Immigrant Population	Duplin (Mean)	Wake (Mean)
Less than High School	0.70	0.24
High School	0.21	0.15
Some College	0.06	0.18
Bachelors	0.02	0.22
Graduate or Professional	0.01	0.20
Naturalized Citizens	0.17	0.35
Latin American Origin	0.95	0.42
Asian Origin	0.02	0.34

Another important difference in the immigrant population between Wake and Duplin is the proportion of immigrants who are naturalized (US Census, 2011b). The proportion of naturalized foreign-born residents is more than twice as large in Wake as in Duplin. Naturalized immigrants are those who have successfully gone through the long process of becoming a citizen (Bohon & Conley, 2015). As citizens, these immigrants can vote and access all of the opportunities available in the United States. Immigrants who are not naturalized usually have a visa allowing them to work or study in the United States for a limited amount of time. A smaller proportion of unnaturalized immigrants are undocumented, meaning they do not have legal permission to reside in the US.

The difference in naturalization rates is important for several reasons. First, being naturalized affords a measure of security to immigrants. These immigrants have the same rights as any other American, and can exercise those rights without fear of being deported. Importantly, citizens can also access federal financial aid to fund post secondary education. On the other hand, non-naturalized citizens live in a more precarious position. Those with work or student visas are at the whim of employers or educational institutions for sponsorship, a requirement for their continued residence. Immigrants who are undocumented can be apprehended and deported at any time. The fear of losing the protection of a work or student visa or of deportation can make non-naturalized immigrants less engaged with public institutions, such as schools (Suarez-Orozco, et al, 2011).

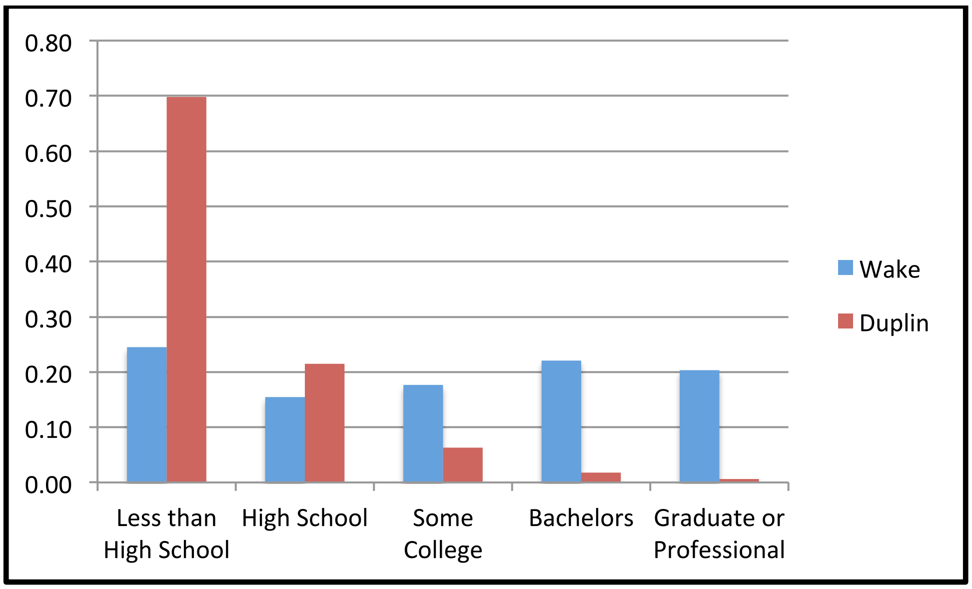

Figure 3. **Bar graph showing educational attainment of immigrants in Wake and Duplin counties.**

Immigration and Els. The growth of the immigrant population in North Carolina is directly correlated to growth in the proportion of students learning English. Figure 4 shows the percent growth in both the public school El population and NES population since the 2005-2006 school year. While the El population more than doubled since 2005-2006, the NES population has remained almost constant. This figure also demonstrates that growth in the El population has not been linear. Demographers reported that following the 2008 recession, many immigrants returned to their countries of origin or migrated within the country in search for employment (Bohon & Conley, 2015). The notable decrease in the El population around 2009-2010 likely reflects this population shift.

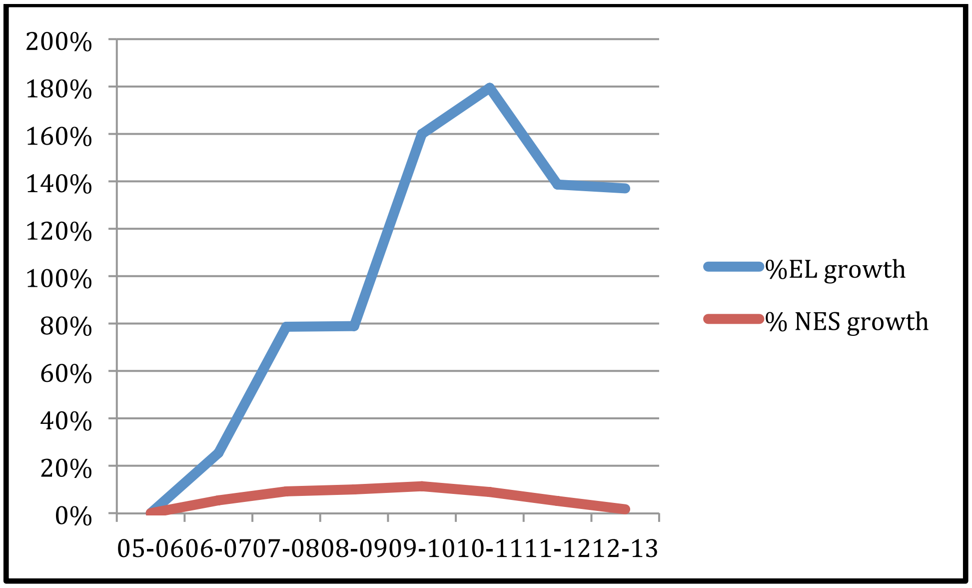

***Figure 4*. Graph showing the percent growth in the public school El and NES population since 2005-06.**

On average, the population of Els in a district grew about 104%, which translates to about 408 students, since the 2001-2002 school year. Because of variation in district size, it is important to note both the percent and absolute growth. Table 6 shows the top five fastest growing districts in terms of percent growth and absolute growth. None of the counties are ranked highest in both categories. Additionally, the districts with the highest percent growth often had very small or non-existent El populations in 2001, and so even marginal growth, such as an increase of 11 students, seems very large.

The increasing El population has financial repercussions for the state and for local school districts. North Carolina allocates additional funds for each El and immigrant student to each district, up to a certain level (10.6%) (Whittenberg, 2011). In addition, districts receive Title III funding from the federal government to support the language acquisition services. The average increase in the allotment provided to each year to each district since 2001-02 has been around $458, 417 (Angela McNeill, Personal Communication, May 28, 2014). The average increase in allotment provided to the five counties listed above with the largest absolute increase in Els was around 10 times as much, at about $4,971,707 (Angela McNeill, Personal Communication, May 28, 2014).

Table 6 ***Districts with Fastest Growing El Populations, 2001-02 to 2012-13***

	# Increase	Rank	% Increase	Rank
Mecklenburg County	9440	1	140.79	25
Wake County	7515	2	168.99	21
Forsyth County	3877	3	141.65	24
Durham Public	2583	4	129.09	27
Guilford County	2449	5	69.02	54
Perquimans County	11	88	1100.00	1
Clay County	19	84	633.33	2
Pasquotank County	104	54	611.76	3
Pamlico County	16	87	400.00	4
Currituck County	23	81	383.33	5

Regional Variation. The above descriptive summary makes it evident that changes in the El population vary considerably by county. Returning to our two example counties, Wake and Duplin, there are clear connections between the characteristics of the local immigrant population and the local school population. The demographics of the foreign born adult population explain some of the differences in the El populations in both counties, shown in Table 7.

While about 13% of the population of both counties is foreign born, the proportion of Els enrolled in Duplin public schools is more than double than the proportion of Els in Wake public schools. In Duplin immigrant parents may be more likely to send their children to public schools whereas in Wake, more affluent and educated immigrant parents may be more disposed to sending their children to private schools. Alternatively, adult immigrants in Duplin may have more children than their counterparts in Wake.

Table 7 ***El Characteristics in Duplin and Wake School Districts***

El Characteristics	**Duplin (Mean)**	**Wake (Mean)**
Current El Reading Achievement	-0.87	-1.01
Reclassified El Reading Achievement	-0.10	-0.13
% Els Eligible for FRPL	0.71	0.63
% Current El	0.18	0.07
% Reclassified El	0.13	0.08
Proportion of Els who are CEL	0.57	0.47
Proportion of Els who are REL	0.43	0.53
Latino	0.98	0.89
Asian	0.00	0.06

A larger share of the El population in Wake County has reclassified as English proficient. This might mean that Els in Wake County are more academically prepared or that schools are doing a better job of helping these students learn English. Considering the high levels of education of the adult immigrant population in Wake, it is likely that immigrant parents in Wake are better positioned to support their child's success in American schools.

These two counties are just two case studies of the diverse contexts of reception in which immigrants find themselves. The differences between Wake and Duplin make it evident that where immigrants choose to locate is related to their how their background characteristics, such as education, matches the labor demands of where they settle. For children, the reason their parents immigrate can have profound impacts on the educational opportunities and academic success of students.

Community factors. Beyond just the growth in the El population, characteristics of the receiving community are related to the schooling experiences of Els. One important facet of the receiving community is how community members perceive immigrants. In North Carolina, researchers have uncovered how income, nativity, and geography are related to the community's acceptance of new immigrants. O'Neal and Tienda (2010) surveyed non-immigrant adults and found that low-income, non-immigrant adults and parents of non-immigrant school age children had more negative attitudes towards immigrants than others. These negative attitudes can have important implications for how children are received in schools in counties that have experienced a large increase in the immigrant population. In their comparison of two counties, one with high immigration growth and the other with low immigrant growth, the authors find some evidence that more growth in the immigrant population within a county is correlated with more positive attitudes towards immigrants (O'Neal & Tienda, 2010). The findings in their study are limited as data are cross-sectional and many measures are based on self-report. However, the study suggests that perceptions of immigrants are malleable and related to certain characteristics of the native population.

The perception school leaders have of immigrants and Els, coupled with access to sufficient resources, can have important impacts on how schools receive Els. A North Carolina school district profiled in one study took an "aggressive and family-centered" approach to accommodating Els and their families (Kandel & Parrado, 2006, p. 126). Programs included a welcome center for new immigrant families that provided English and GED classes for adults, tours of local institutions such as hospitals, and legal assistance. Importantly, the authors explain that because this North Carolina district is located in an urban area, it had access to more funding and human capital and enrolled a less mobile and higher income immigrant population than existed in the rural Mississippi district they also profiled. Additionally, efforts to provide programming and services for immigrant students and their families were the result of localized efforts, not mandates from the state or district. In the district, the receiving community demonstrated that they valued the contributions of immigrants and welcomed immigrants and children into the school.

North Carolina policies related to Els. An important facet of an immigrant's new community is the government policies that shape the community in which an immigrant lives (Portes & Zhou, 1993). Federal, state, and local policies dictate both how immigrants will be received in the community and how immigrant students will be received in school. As described above, Federal laws and court decisions broadly dictate the services that must be provided in public schools for Els. North Carolina as a state has leeway to create and implement policies that directly impact the lives of Els. These include how Els are identified, taught, and reclassified; they type of English language development programs that can be used; and requirements for how teachers will be trained and certified to teach Els. At the community level, state and local immigration polices impact students and their families. In the following sections I detail policies relevant to how Els are educated in North Carolina.

Student related policies. According to Title III of No Child Left Behind each state must report the number of Els that have been identified and the percent that have been reclassified as English proficient each year (NCLB, 2002; Garcia, 2007). The federal government mandates the use of a standardized process for identifying and reclassifying English learners in order to minimize misclassifying students and thus misallocating resources. Over-identifying students or keeping students labeled as an El longer than necessary diverts scarce school resources towards unnecessary services, while the opposite impedes a student access to services mandated by federal law. In spite of the mandate to create standardized processes, the federal government leaves it up to each state to devise their own rules for identifying and reclassifying English learners.

Identification. Identification is typically based on two pieces of data: the student's native language and English proficiency. Schools typically assess the student's native language using a "Home Language Survey" (HLS) which consists of 3- 10 questions aimed at assessing which language a student first learned to speak, which language they speak most often, and whether they are exposed to languages other than English in the home. North Carolina, along with forty-two other states, allow individual districts to design their own home language surveys, ensuring that variability in the construction of home language surveys occurs not only across states but also across districts within states.

Students flagged by the HLS in North Carolina take the W-APT (WIDA[8] – ACCESS Placement Test) that assesses student proficiency in English across the four language domains of reading, writing, speaking, and listening. Parents can waive the right for their children to enroll in an ELD program even if they are identified as not proficient in English by the WIDA assessment. In the case that a student's parents waives services, the student is still considered an El for accountability purposes and must still take the WIDA ACCESS test on a yearly basis until they pass the proficiency thresholds.

Reclassification. Reclassification refers to the process by which El students are determined to be English proficient and thus no longer eligible for services. It is important to

[8] World-class Instructional Design and Assessment (WIDA) is an organization that develops standards and assessments for English learners. The WIDA consortium is a group of 33 states that use the WIDA developed assessments for identification and yearly language assessments. North Carolina joined the WIDA consortium in 2008.

remember that Els are expected to become proficient in English during their time in school and join the mainstream population. Reclassification typically depends not only on English proficiency, but also on other factors such as academic proficiency and teacher perception (Mavrogordato, 2012; Grissom, 2004).

The first benchmark for reclassification as English Proficient is tied to the annual assessments Els are mandated to take according to NCLB. Each state has adopted or created an English language proficiency exam used to measure the progress Els make on the four language domains. Els in North Carolina take the WIDA ACCESS (Assessing Comprehension and Communication in English State-to-State for English Language Learners) exam, which measures English, proficiency in the four language domains (reading, writing, listening, and speaking). An El in North Carolina must reach a level of 4.0 out of 6.0 in reading and writing as well as a composite score of 4.8 (an average of all language domain proficiencies) in order to be eligible to exit. After a student exits, they are then monitored for two years to insure they are making adequate progress.

ELD Instruction. North Carolina allows for districts and schools to choose from among a wide variety of ELD programs, including sheltered English instruction (e.g., SIOP), Pull out ESL instruction, co-teaching models, one way bilingual programs, and dual immersion programs. Bilingual programs of any type are very uncommon; in 2014 there were only 95 bilingual schools across the state and were mostly charter schools located in urban areas (NC DPI, 2014).

*El testing***.** Els in North Carolina participate in several standardized assessments each year. As mentioned above, Els take the WIDA ACCESS test each year until they reach proficiency and are reclassified. Els who enter the school system after Kindergarten and receive below a 4 on the reading subtest on the W-APT are not required to take the English Language Arts End of Grade Assessment for one year. Except for this waiver, Els must take the same standardized achievement tests as their native English speaking (NES) peers, regardless of their language proficiency. Students in grades 3-8 take a standardized reading and math End of Grade exam each year. Additionally, students in grade 5 and 8 take an End of Grade science test. Students in 10th grade take End of Course exams if they are enrolled in classes that require them. Currently, there are End of Course exams for Biology, Algebra I/Integrated I, and English II (NC DPI, 2015).

Undocumented students. A recent report from the Pew Hispanic Center estimates that 3.5% of the immigrant population in North Carolina is undocumented (Passel & Cohn, 2013). While Els are not necessarily undocumented students, documentation status is an important impediment to academic achievement for many immigrant students. The Supreme Court case *Plyler vs. Doe* (457 U.S. 202, 1982) guarantees undocumented students the right to a free K-12 public education. In response to Alabama's HB 56 law that restricted many of the rights and freedoms of undocumented immigrants, a federal district court has also decided that schools can not ask students for social security numbers or any other evidence of legal status (*United States v Alabama*, 2013). However, there have been at least two lawsuits brought against school districts that have barred undocumented immigrants from enrolling in public schools (Southern Poverty Law Center, 2014). The Southern Poverty Law Center claims that some immigrant students:

> …are being turned away at the schoolhouse door for reasons such as immigration status, limited English proficiency, and age. Enrollment is also significantly delayed for many unaccompanied children due to inability to verify domiciles or prove that sponsors

are legal guardians. Further, unaccompanied children and their sponsors are being discouraged from enrolling due to inadequate language access in schools and an unwelcoming, hostile environment".

Additionally, the right to a free public education does not extend to post-secondary institutions, where undocumented students are denied federal financial aid and in most cases have to pay international or out of state tuition to attend public universities or community colleges. To date, 18 states, not including North Carolina, have enacted provisions to allow in-state tuition rates for undocumented students. As of the 2012 DACA decree (Deferred Action for Child Arrivals), undocumented students who graduated from a North Carolina high school are able to enroll in public universities and colleges, but must pay out of state tuition ("NC Nixes Cheaper Tuition", 2014). Restrictive polices towards undocumented students are problematic because they can discourage youth from enrolling in college preparatory courses, finishing high school, or pursuing academic endeavors (Patel, 2012).

Teacher related policies.

*Certification**.*** A teacher working in North Carolina must complete the following requirements in order to become certified as an ESL teacher: 1. Complete a state approved teacher education program OR complete another state's alternative certification route, meet federal requirements to be designated as "highly qualified" AND earn a bachelor's degree from accredited university 2. Pass the Praxis 1 Reading, Writing, and Math Exam, and 3. Pass the Praxis 2 Teaching Exam. This structure allows teachers to earn an ESL endorsement by simply passing a test, without having to complete any ESL specific program of study or any hours of clinical observation. Teachers must score a 141/200 in order to pass the Praxis 2 ESL test. This cut-off is slightly below the average cut-off of 145/200 set by the 21 other states that use this test (ETS, 2015).

*Accountability***.** Teachers in North Carolina are evaluated using the Education Value-Added Assessment System (EVAAS), a measure that is intended to measure the average growth made by each teacher's students that is attributable to the teacher and not student or community characteristics. EVAAS scores are calculated using student achievement scores on the standardized End-of-Course exams, End-Of-Grade assessments, and, beginning in the 2012-2013 school year, Measures of Student Learning Exams. End-of-Grade exams are administered in the last 10 days of the school year and assess student learning in English Language Arts/Reading and Math in grades 3-8 and Science in grades 5 and 8. End-of –Course exams are used to assess student learning in Math in 9th grade and English and Biology in 10th grade (NC DPI, 2015). The new Measures of Student Learning are meant to provide assessment data to evaluate teachers in otherwise non-tested subjects and grades. They include assessments of English Language Arts, Math, Science, and Social Studies in grades 4-12. NC DPI developed a system of analyzing student work for ESL teachers that will count as their Measure of Student Learning assessment that they piloted for the first time in 2013 (NC DPI, 2015).

It is not clear who is considered an ESL teacher- if it is any teacher with an ESL license, or only those teaching a certain proportion of Els in each class.

Pupil Teacher Ratio. North Carolina has established student teacher ratios that are used for funding purposes. This ranges from 1 teacher to 19 students in Kindergarten to 1 teacher for every 29 students in high school (highlights of the north Carolina public school budget February). There are no state policies mandating the pupil-teacher ratio for ESL classes or ESL teachers. According to district documents, some districts are attempting to keep the pupil-teacher ratio to less than 50 Els per ESL teacher (DPS, 2015). In contrast, Tennessee has a mandated statewide staffing policy that requires a pupil-teacher-ratio of 40 Els to 1 ESL teacher.

School, district, state, and other policies. *Title III funds***.** The federal government provides categorical grants to districts for the education of English learners and immigrant students through the Title III program. This money is distributed to districts based on both the number of Els in the district as well as the percent increase in immigrant students. In order to receive Title III grants to support language acquisition services, districts must enroll at least 20 Els or 2.5% of the average daily membership must be Els. Districts can receive Title III significant increase grants if the population of Els increases by 4% over a period of two years. Districts that do not qualify for Title III funding can join with other districts to create a consortium that shares resources. The amount of monetary support comes to about 1,452 dollars per El.

Districts that receive Title III funds must develop Annual Measureable Achievement Objectives (AMAOs) in order to track the progress of Els. The three AMAOs, created by the state, are to monitor the proportion of Els making progress in learning English, attaining English proficiency, and making AYP for the El subgroup.

Title I Funding. In order for a school to be mandated to report sub-group data for Els and receive Title I funding to support this population, the school population of Els must be greater or equal to 40 students or 1% of the tested population (AIR, 2012).

State Funds. The state of North Carolina also provides districts with money to support the education of Els according to both the number and concentration of Els in the district (NC

DPI, 2015). This funding is capped: if the population of Els surpasses 10.6% of the average daily membership, the district does not receive additional per pupil funds. About 40% of districts had an El population that exceeded this cap in 2013, meaning that they had to make up the difference using local resources. This cap creates a structure whereby districts with the highest El populations are systematically underfunded.

In 2013-2014, state funding amounted to about 779 additional dollars per El, in addition to the base per student allotment of about 5,075 dollars. In comparison, schools are allotted an additional 338 dollars for each low-income student and an additional 3,761 dollars for each special needs student.

Immigration policies. North Carolina is certainly not the most restrictive southern state in terms of its immigration policy, and many communities have created structures to welcome new immigrants (Immigration Policy Center, 2014). In North Carolina, undocumented immigrants are entitled to emergency services, health care, and other programs that the state deems necessary for safety ("North Carolina State Immigration Laws", 2015). Like in most states, a social security number is required for obtaining a drivers license, but young adults eligible for DACA (Deferred Action for Childhood Arrivals) are eligible to apply for this documentation (National Immigration Law Center, 2013). State agencies and private businesses with more than six people are required to use the E-verify system, created to verify a person's documentation status, when hiring.

North Carolina participates in the ICE ACCESS program, in which local law enforcement partners with the Federal Immigration and Customs Enforcement office to enforce immigration regulations and facilitate deportation of immigrant criminals (Nguyen & Gill, 2010). An evaluation of the implementation of the ACCESS program found that most immigrants were detained for traffic violations and other misdemeanors, and that the program was hurting the relationship between the Latino immigrant community and law enforcement. In recent years, the American Civil Liberties Union and the US Department of Justice have investigate police departments in North Carolina accused of racial profiling (North Carolina Justice Center, 2010; Santiago, 2013). These programs sometimes lead to a culture of fear among immigrants which might be associated with less family engagement with the school.

Conclusion. Several conclusions emerge across studies of schooling in new destinations. First, Els in North Carolina tend to enroll in qualitatively different schools in new destinations than in traditional destinations. Evidence suggests that Latinos are more likely to be attending schools outside of urban centers with more affluent peers and more credentialed teachers (Dondero & Meuller; Fry, 2010). However, these findings largely come from analyses limited to descriptions of school level characteristics culled from information from large metropolitan areas, and they tend to focus on Latino students. Qualitative studies in North Carolina and elsewhere have shed light specifically on the education of Els, and show that schools and communities in new destinations are facing many of the same obstacles to educating Els documented in traditional destination areas and that they are reacting to growing populations of Els differently according to their capacity.

Evidence from research and policy reports suggest that North Carolina is only just beginning to think on a large scale in terms of its policies regarding the education of Els. The clearest policies are those related to testing, identification, and reclassification, and are directly related to the federal mandates stipulated in No Child Left Behind. Before the enactment of

NCLB, there were no consistent policies regarding accountability and districts were essentially left to their own devices.

That being said, there has been little thought as to how Els should be assessed for accountability purposes. Besides allowing recent immigrant arrivals to opt out of taking the standardized ELA exam during the first year they are attending an American school, Els take the same regimen of standardized tests (in addition to standardized tests that judge their language proficiency) as native English speakers. Thus both Els, and their teachers, are held accountable for their performance on a test that research has shown is not a valid assessment of Els (Solórzano, 2008).

Policies describing how teachers should be prepared to teach Els are almost non-existent. In fact, nowhere on the NC Department of Public Instruction website are the requirements for teacher Els listed (because in essence there are no requirements). There is little evidence that public universities across the state have filled this vacuum, as most do not provide programs for teachers who want to specialized in teaching Els.

In North Carolina, the largest impediment to El success is school indifference. There are few policies that prescribe how Els can be supported, and so in practice, schools have substantial freedom to shape the educational contexts for Els. As evidence by research cited above (Bennet, 2012; Kandel & Parrado, 2006; Franklin, 2012), this can be tremendously beneficial if school leaders make supporting Els and their families as they transition to a new community a priority. However, there are likely to be at least as many instances where Els are not afforded the support they need to be successful simply because educators are not aware of what they could be doing.

Theoretical Framework

The literature cited above suggests some of the important community, school, and classroom factors that may be related to El achievement. In this section, I rely on theories of assimilation and social and cultural capital development to explain why segregation and teacher training might help or hinder the academic trajectories of Els. I conclude by describing two hypotheses specifically related to classroom level factors that I subsequently test.

Achievement as Assimilation

For English learners, who are immigrants or the children of immigrants, long-term success depends on how successful they are at assimilating into American culture. The idea of assimilation has a long and contentious history related to deficit views of immigrants and government policies aimed at eradicating immigrants' native identity and culture (Alba & Nee, 1997). In recent scholarly work, assimilation has been conceptualized in a more neutral manner and defined "as the decline, and at its endpoint the disappearance, of an ethni-racial distinction and the cultural and social differences that express it" (Alba & Nee, 1997, p.863) that "occurs spontaneously and often unintendedly in the course of interaction between majority and minority groups" (Alba & Nee, 1997, p.827). For students in schools, learning English and the "language of schooling" is arguably the most important indicator of assimilation.

The earliest theory describing the assimilation process is straight-line assimilation, which posits that immigrants assimilate in three stages: acculturation, structural assimilation, and intermarriage (Gordon, 1964; Massey, 2010). Acculturation is when immigrants learn the language and superficial cultural aspects of their host nation. Structural assimilation is when immigrants share social networks with natives of the host nation, and intermarriage, which assumes diminished prejudice and discrimination, is when immigrants are so ingrained in the host nation that they intermarry with native residents.

Gordon's theory has been criticized for being ethnocentric and not supported by data (Alba & Nee, 1997). In a subsequent iteration of assimilation theory, Portes and Zhou (1993) advanced the model of segmented assimilation. This theory posits that there are multiple assimilation trajectories that are conditional on characteristics of the individual immigrant and structural characteristics of the receiving country, or what they call the context of reception. Immigrants can follow the upward path delineated by Gordon's theory of straight-line assimilation, and integrate into "mainstream" American culture over time. Another possibility is that immigrants follow a path of downward assimilation, characterized by "permanent poverty and assimilation into the underclass" (Portes & Zhou, 1993, p. 82). In a third trajectory, immigrants follow a path by which they advance economically and are able to maintain their ethnic identity and community. Salient immigrant characteristics that are related to different paths of assimilation include employment status (e.g., manual laborer, entrepreneur, or professional), English proficiency, race/ethnicity, and documentation status. For students, both their individual characteristics and those of their parents impact their assimilation trajectory. As noted above, on average Els and their parents are characterized by attributes such as low-income status, low educational attainment, and minority identification that predict downward assimilation.

Equally important in explaining how immigrants assimilate is their context of reception, which is defined by the following modes of incorporation: "the policies of the host government; the values or prejudices of the receiving society; and the characteristics of the co-ethnic community” (Portes & Zhou, 1993, p. 83). According to the segmented assimilation framework, government policies can be receptive, indifferent, or hostile; members of the receiving society can either harbor feelings of prejudice, ambivalence, or non-prejudice towards a particular immigrant group; and the co-ethnic community can be weak or strong (for examples, see Portes & Zhou, 1993). Strong co-ethnic communities are those that have an established place in the local community and economy, where immigrants or co-ethnics own or run businesses, and where social networks can provide material and social capital to newly arrived immigrants.

For students, the context of reception is not only the community in which they live, but also the school they attend and the particular classes in which they are enrolled. Extending the typology of modes of incorporation to the school community, school or class policies can be receptive, hostile, or indifferent towards immigrant and El students; adults and peers can be prejudiced, ambivalent, or non-prejudiced towards immigrants; and Els can be in a school or class with a strong or weak co-ethnic community.

Within schools and classrooms, receptive policies could be the school providing bilingual services for children and their families, the school offering heritage language classes, teachers using culturally relevant curricula, teachers using pedagogical practices that attend to both the academic and sociocultural needs of students, or any other policy that is implemented by teachers or in schools that helps create a school community that treats cultural diversity as an asset. The North Carolina school district profiled above by Kandel and Parrado (2005) is an example of a receptive school district. On the other hand, a hostile school environment may include policies that deny resources or opportunities to immigrant students or marginalize immigrant students and families.

Both peers and adults can be prejudiced towards immigrant students, and can manifest that prejudice by lowering expectations, treating immigrant students as inferior, or teasing and excluding immigrant students. Ambivalence towards immigrant students can be as harmful as overt prejudice. For instance, the teachers profiled in Reeves (1994) study were ambivalent about the particular instructional needs of Els, and thus refused to provide certain accommodations.

Finally, a strong co-ethnic community is comprised of adults, e.g. teachers, principals, or other school staff, who act as institutional agents (Stanton-Salazar, 1997) connecting immigrant students with opportunities and resources for academic advancement. The co-ethnic community is also comprised of other students who can act as role models that support an immigrant's adaptation to the school culture. Co-ethnic teacher and student communities can be measured by the proportion of a school that shares the student's race or language background. Neither race or language background is a perfect indicator of whether two individuals come from the same ethnic or cultural backgrounds. However, previous research supports the use of race or native language as a proxy for cultural background (Donato, Shan & Marschal, 2011; Stanton-Salazar, 2010).

Teachers as Institutional Agents

Stanton-Salazar (1997) suggests that for minority children, teachers act as important institutional agents, defined as "individuals who have the capacity and commitment to transmit directly, or negotiate the transmission of, institutional resources and opportunities ….[which] include information about school programs, academic tutoring and mentoring, as well as assistance with career decision-making and college admission" (p.6). According to his framework, institutional agents help students access several forms of institutional support: knowledge of the discourse of schools, connections to mainstream social networks and opportunities, advocates and role models, evaluative feedback, and guidance on managing the school institution.

A critical role that teachers can play in the lives of Els is in teaching the discourse, or "language of schooling", that students need in order to succeed. This language includes not only academic English, but also the values and ways of being associated with the White, middle class, non-immigrant culture (Delpit & Dowdy, 2008).

A second important part of Stanton-Salazar's framework (1997) is an explanation of the ways that schools, and other institutions, are structured to impede the ability of minority students to accumulate social capital and institutional resources. He explains that schools are structured in a way that encourages distrust and detachment, superficial relationships, and race and class based divisions. Inside the classroom, teachers help students overcome these structural barriers by cultivating caring and personalized relationships. To develop personalized learning connections based on an ethic of caring, teachers must show interest in their students, be enthusiastic, and attend to their needs (Whitney, Leonard, Leonard, Camelio & Camelio, 2005). Their interactions with students must occur both formally and informally. Teachers demonstrate caring by listening to students, treating students with respect, validating student feelings, helping students develop their own sense of efficacy, and giving students opportunities to make responsible choices (Collier, 2005). When teachers successfully create caring and personal learning connections students feel more attached to school (Wilson, 2014).

Hypotheses

The primary purpose of this study is to test how two classroom level factors, within-school segregation and teacher training, are related to achievement. I posit two hypotheses regarding how classroom context is related to achievement to be tested derived from the theories and literature reviewed above

Relationship between being taught by an ESL trained teacher and achievement. Based on the literature related to teacher effectiveness and preparation and Stanton-Salazar's theory of Institutional agents, I suggest that teachers with specific training or experience with Els will be better prepared and more willing to teach students the discourse of schools, as well as give appropriate feedback and guidance to students based on knowledge of how students learn a second language. I also posit that teachers who decide to work with Els will be more likely to serve as advocates and role models, and, because they may better understand the contexts from which Els come from and the needs of these students, they may be more likely to provide emotional and moral support (Patel, 2013).

Second, I conjecture that teachers who care about the academic success of Els may be more likely to have sought out training in how to teach Els or have gone through the process of receiving a credential to teach ESL. While these indicators certainly will not capture all of what researchers have found to be attributes of a caring teacher, they do reveal a certain motivation a teacher has to specifically address the needs of the El population. This may be especially true in a place like North Carolina, where training and credentialing are not required of most teachers who teach Els. While a teacher with experience teaching Els may not be more or less caring towards these students than those who do not, they will have had more opportunities to develop the capacity to be a positive institutional agent.

Hypothesis 1: Els who are taught by a positive institutional agent, in the form of a credentialed ESL teacher or a teacher with experience teaching Els, will perform better in math and reading than those who do not.

Relationship between classroom exposure to NES and achievement. As suggested by previous research and segmented assimilation theory, the relationship between the level classroom exposure of Els to NES and achievement can be positive or negative. Els learn the language and culture of the host nation from their peers and teachers. However, if English learners are isolated from native English speaking students or non-immigrant students, the ability for them to acculturate may be diminished. If Els are segregated from native English speakers at school, it follows that their ability to become part of the social networks of non-immigrants is also diminished. In this case we would expect students in segregated classes to have lower achievement than students in integrated (i.e. mainstream) classes.

At the same time, a segregated class might allow for the development of a strong co-ethnic community. Students from a similar language or cultural background, or even who simply share the experience of learning a new language, might develop a strong social network that that allows them to follow a path of positive assimilation. In this case we would expect students in segregated classes to have higher achievement than students in integrated classes.

Els in segregated classes are more likely to be taught by an ESL trained teacher who is positioned to act as a positive institutional agent. Access to a positive institutional agent may offset the disadvantage of being isolated form native English speaker peers or compound the positive effect of being in a classroom with a strong co-ethnic community.

Hypothesis 2: Els in segregated settings will perform differently than those in integrated settings. The relationship between segregation, in terms of exposure, and achievement will be conditional on whether an El has access to a positive institutional agent, as described above.

Student, class, and school factors. Prior research and theoretical contributions suggest other important student, classroom, and school factors that should be accounted for in subsequent analyses. The theory of segmented assimilation provides a framework for categorizing class and school factors as indicators of welcoming polices or practices, indicators of a positive reception of immigrants by peers and adults, and indicators of the size and strength of the co-ethnic community.

Important student factors include demographic characteristics such as gender, race/ethnicity, country of origin, and prior achievement. Class factors include teacher experience, class size, and course level and school factors include the percentage of teachers who are certified, have a national board certification, or have an advanced degree, the size and demographic composition of the school, school funding, and school level. Figure 5 depicts the relationships among all relevant variables described above.

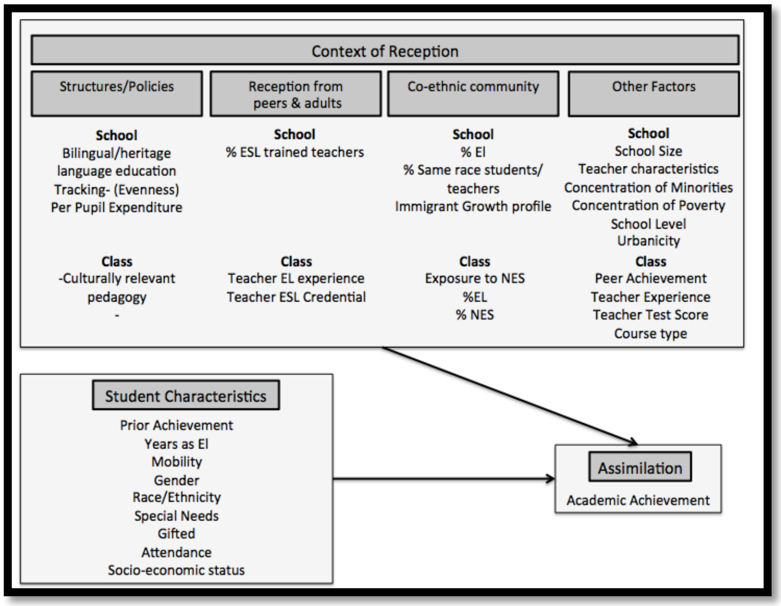

Figure 5. **Theoretical framework.**

CHAPTER III

METHODS

The purpose of this dissertation is to document two important features of the classrooms in which Els are taught and estimate the impact of those features on their academic achievement. Specifically, I ask the following questions:

1. To what extent are Els segregated from native English speakers within their math and language arts classes?
    a. How does segregation vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles?
2. How frequently are Els taught by an ESL credentialed or El experienced teacher in their math and language arts classes?
    a. How does access to a ESL credentialed or El experienced teacher vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles
3. How does the school and class context of reception impact student achievement?
    a. Does the degree of classroom segregation impact El achievement on standardized tests of math and language arts?
    b. Does being taught by an ESL credentialed or El experienced teacher impact El achievement on standardized tests of math and language arts?
    c. Does the effect of being in a segregated class differ for students who are or are not taught by credentialed or experienced ESL teachers?

I begin Chapter 3 by providing a description of the research design employed in this study, followed by a description of the data source and the analytical sample. I then describe how the variables used to answer the three research questions are measured. I follow with a presentation of the analytical strategy and specific models that will be employed and conclude with an explanation of the limitations to my study.

Research Design

Research questions 1 and 2. The first stage of this study examines descriptive statistics to shed light on the previously unexplored characteristics of the classrooms and teachers of Els. In particular, I uncover the extent to which current Els (CELs) and reclassified Els (RELs) are segregated from NESs in their math and language arts classrooms as well as their access to teachers with an ESL credential or with experience teaching Els. I compare the overall means and standard deviations of these variables, as well as how they vary conditional on other variables (described below) across the population of CELs and RELs in North Carolina for each year of the study (2006-2007 to 2012-2013) to understand how the educational context for Els is changing over time. I investigate the extent to which segregation and access to ESL trained teachers varies by urbanicity (indicated by whether a student goes to school in an urban, rural, or suburban setting), school level (i.e. elementary or middle school), and demographic composition (i.e. proportion of students who are El). Additionally, I compare the classroom and school contexts of Els in schools with different immigrant growth profiles to expose differences between schools that have different histories serving Els. While all of North Carolina can be considered a new immigrant destination due to overall demographic change, I create immigrant growth profiles to distinguish schools that have had more or less growth in the El population since 2001. Comparisons between schools differentially impacted by immigration will help clarify the school experiences of Els in new and traditional destinations. Overall, the descriptive analyses expose trends and variations in the experiences of students based on his or her El status that anchor the rest of the study.

Research question 3. The final question is aimed at understanding what classroom contexts best equip Els to thrive. Specifically, I want to understand the extent to which variations in classroom contexts lead to variations in the academic achievement of Els in reading and math.

In this study two conditions are analogous to primary “treatments”: how exposed Els are to native English speakers in their classrooms (a measure of segregation) and access to a credentialed or experienced ESL teacher (an indicator of access to an institutional agent). Isolating the impact of either treatment on an El’s achievement is not a straightforward proposition. To illustrate, I focus on access to a credentialed teacher. According to Rubin’s Potential Outcomes Framework, the method for estimating the causal effect of access to a credentialed teacher on achievement must approximate the impossible scenario whereby a researcher observes and compares outcomes for a child both receiving and not receiving treatment at the same time under the exact same conditions (Murnane & Willett, 2011). One way to approximate this scenario is to compare the average achievement of a group of students receiving treatment to the average achievement of a group of students not receiving treatment and who are equivalent in expectation across all other variables that may affect achievement. Conducting a randomized control trial, where teachers with and without an ESL credential are randomly assigned to classrooms and then Els are randomly assigned to teachers, guarantees that students receiving treatment were equal in expectation to those who were not. Randomly assigning teachers with and without credentials to classes ensures that a student receives treatment by chance and not because of an observed or unobserved characteristic of either the student or teacher, such as prior achievement or years of experience. In this experimental scenario, the difference between the average achievement of students taught by a credentialed ESL teacher and those not taught by a credentialed ESL teacher can be attributed to having received treatment.

As such an experiment is outside of the scope of this study, I rely on several statistical methods to as closely approximate a randomized experiment as is possible with longitudinal data. Following Todd and Wolpin (2003), I begin with the assumption that achievement and "child development is a cumulative process that depends on the history of family and school inputs as well as inherited endowments" (p.31). I construct a model that includes relevant and available indicators of family and school inputs, as well as individual student ability, to account for differences in the developmental history of individual children that may be related both to current achievement and assignment to the treatment condition. Including students' prior achievement in the model accounts for non-contemporaneous unobserved school and family inputs as well as a child's innate ability. Assuming reliable measures of achievement, including prior achievement scores, controls for prior family and school inputs and limits confounders to contemporaneous inputs. Using OLS regression, I compare the average achievement gains of all Els who have ESL credentialed teachers to the average achievement gains of all Els who do not receive treatment. The model controls for students' prior achievement and observed contemporaneous differences that exist between students, classrooms, and schools for which covariates are available that might be related to both achievement and assignment to a credentialed teacher. The model is shown in Equation 1:

$$Y_{ijst} = \alpha + \beta_1 Treatment_{jst} + \beta Y_{it-1} + \beta_2 X_{ijst} + \beta_3 C_{jst} + \beta_4 S_{st} + \epsilon_{ijst} \quad (1)$$

Where $\boldsymbol{Y_{ijst}}$ the achievement of student *i* in class *j* in school *s* in year *t*. $\boldsymbol{Y_{it-1}}$ is a student's prior year achievement, ***Treatment*** indicates whether a student has an ESL credentialed teacher, $\boldsymbol{X_{ijst}}$ is a vector of student controls, $\boldsymbol{C_{jst}}$ is a vector of classroom controls, $\boldsymbol{S_{st}}$ is a vector of school level controls, and $\boldsymbol{\epsilon_{ijst}}$ is a random disturbance term. The coefficient of interest, $\boldsymbol{\beta_1}$, indicates the average difference in achievement for Els with and without treatment, controlling for the included covariates.

OLS regression models that incorporate an extensive set of covariates correlated with assignment to treatment and the outcome are able to minimize bias and approximate results found using more complicated statistical approaches (Henry & Purtell, 2014). However, in this study, data limitations prevent the inclusion of important student, teacher, and school level variables, such as a student's country of origin, their documentation status, parent income, a student's English language proficiency, teacher attitudes towards teaching Els, a teacher's total years of experience teaching Els, and the amount of ESL related professional development offered in a school or district, to name a few. To the extent that the effects of these variables on a student's achievement are not already captured by a students' prior test score and other available covariates, and are related both to student achievement and assignment to treatment, their omission will bias the estimate of the treatment effect (Todd & Wolpin, 2003).

To illustrate, imagine a situation where Els with a particular characteristic, such as being a recent immigrant, are systematically sorted into the treatment condition, that is, classes taught by teachers with an ESL credential. If being a recent immigrant, an unobserved and omitted variable, is also related to student achievement after adjusting for the students' prior achievement and other covariates, then the estimate of the treatment effect is biased. In essence, the model would attribute differences in achievement to the treatment that are also partially explained by a students' status as a recent immigrant. Non-random sorting of both students and teachers into the treatment condition also occurs at the school level. Imagine Els who have credentialed teachers tend to enroll in schools that mandate Els participate in afterschool language instruction. If this school level factor is not explicitly controlled for, and is related to student achievement, estimates of the treatment effect will be biased.

Non-random sorting is not a hypothetical scenario but a common phenomenon in most school systems (Loeb & Béteille, 2008; Clotfelter, Ladd, & Vigdor, 2006). As described previously, Els tend to enroll in schools that are low performing, enroll high proportions of Els and other minority students, and enroll high proportions of low-income students. The distribution of teachers who are fully credentialed, have the most experience, and have the most preparation is also not random (Corcoran & Evans, 2008). I use a fixed effects estimation strategy to mitigate the bias created by pervasive non-random sorting and an inability to control for all the unobserved factors that may be related to how students or teachers are sorted.

Fixed effects estimators minimize bias attributable to omitted variables and non-random sorting of students into classes and schools by creating within unit comparisons. I estimate models that include school fixed effects, student fixed effects, and then both school and student fixed effects. Each model provides certain protections against bias as well as certain limits on generalizability. By using school fixed effects, I limit my comparisons of achievement to students who attend the same school who were either taught by an ESL credentialed teacher or not or who were enrolled in classrooms with varying levels of exposure to NESs. Researchers have documented variation in how Els are accommodated across schools that are not captured by available data; for instance, some schools have established welcome centers for new immigrant students and their families where the school takes an active role in helping parents acclimate to their new community and learn English (Bennett, 2012; Kandel & Parrado, 1996). If Els who attend these schools are also more likely to receive one or both of the treatments, and if we assume these school programs impact the achievement of all Els attending the same school in the same way, this unobserved factor could no longer account for variation in student achievement.

School level fixed effects control for non-random sorting of teachers and students into schools related to covariates that are excluded in the model specifications and may impact El achievement; however, they do not control for non-random sorting of students or teachers into classes within a school. For instance, imagine Els with the most engaged parents within a school are systematically assigned to classes taught by the teachers who hold an ESL credential in order to prevent any complaints. Because parent engagement is correlated both to whether a student receives treatment and student achievement (Epstein, 1996; Hattie, 2009), the treatment effect for credentialed teachers would be inflated by the positive impact of parent engagement. Using student fixed effects allays this bias by comparing the deviations from average achievement of a student in years they were taught by a credentialed teacher to the deviations from average achievement of the same student in years when he or she was taught by an un-credentialed teacher. Following the same logic used above, the effect of any time invariant characteristic of the student, like their parent's level of engagement, will be excluded from the treatment effect estimates.

By combining student and school fixed effects, I control for both non-random sorting of students and teachers to both schools and classrooms. Essentially, this strategy allows for the comparison of achievement within a student while that student is enrolled in one school.

Fixed effects estimators work through demeaning unit level variables. Demeaning is accomplished by subtracting the average value of a variable within a unit from the value of the variable for student *i* at time *t.* Equations 2 and 3 represent the process of demeaning at the school and student level, in turn.

$$(Y_{ijst} - \bar{Y}_s) = \beta_0 + \delta_j\left(Treament_{ijst} - \overline{Treatment_s}\right) + \beta_i(X_{ijst} - \bar{X}_s)$$
$$+\beta_j(X_{ijst} - \bar{X}_s) + \beta_s(X_{st} - \bar{X}_s) + (\varepsilon_{it} - \bar{\varepsilon}_{is}) \quad (2)$$

Where *i* indexes students, *j* indexes classrooms, *s* indexes schools, and t indexes time. ***Y*** represents student achievement, $\boldsymbol{\delta_j}$ is the estimated effect of the classroom level treatment on achievement, $\boldsymbol{\beta_i}$ is the coefficient on student level variables, $\boldsymbol{\beta_j}$ is the coefficient on classroom level variables, $\boldsymbol{\beta_s}$ is the coefficient on time varying school level variables, and $\boldsymbol{\varepsilon_{it}}$ is the random error term.

$$(Y_{ijst} - \bar{Y}_i) = \beta_0 + \delta_j(Treament_{it} - \overline{Treatment_i}) + \beta_i(X_{ist} - \bar{X}_i) \quad (3)$$
$$+\beta_j(X_{ist} - \bar{X}_i) + \beta_s(X_{ist} - \bar{X}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i)$$

Where $\boldsymbol{\beta_i}$ represents the coefficient on time varying student level variables and all other terms and subscripts following from the preceding equation.

Demeaning across a unit causes variables that do not vary within that unit to drop out of the equation. For example, if ***X*** is a binary indicator that a student is Latino in the expression

$\boldsymbol{\beta}_i(\boldsymbol{X}_{it} - \overline{\boldsymbol{X}}_i)$ the difference between the two terms is zero and so the entire term is removed from the equation. In equation 2, the expression ($\boldsymbol{Treament}_{it} - \overline{\boldsymbol{Treatment}_i}$) represents the difference between the level of treatment for student *i* at time *t* and the average treatment student *i* has received across all observations. Put differently, the student fixed effects model forces the student to serve as his or her own control. Similarly, the corresponding term in the school fixed effects model represents the difference between the level of treatment for student *i*, in school *s*, at time *t* and the average level of treatment for all students in school *s* at any time.

Models that use two sets of fixed effects, for instance both student and school fixed effects, estimate the effect of treatment by demeaning the data, as above, for the first fixed effect unit, and then including dummy variables for the second fixed effect unit. In this study, this process entails demeaning student data to create the student fixed effect, and then including a dummy variable for each school to create the school fixed effect.

Data Set

To understand how classroom characteristics impact the achievement of Els, I use longitudinal student and teacher level data collected by the North Carolina Department of Public Instruction (NC DPI) as well as teacher level data collected by the North Carolina General Administration (NC GA). Each year the NC DPI provides demographic and achievement data on teachers and students, at the individual and school level, which is compiled by the Education Policy Initiative at Carolina (EPIC) center housed in the public policy department at the University of North Carolina at Chapel-Hill.

Student achievement data includes each student's test scores on the standardized End-of-Grade or End-of Course exams that are administered near the end of each school each year. Students in grades 3-8 take a standardized reading and math End-of-Grade exam each year. Additionally, students in grade 5 and 8 take an End-of-Grade science test. High schools students take End-of-Course exams if they are enrolled in classes that require them.

The NC GA provides additional information on a yearly basis for teachers who are enrolled in undergraduate or graduate teacher preparation programs at any of the 17 universities that are part of the University of North Carolina system. Data provided through the UNC GA include whether a teacher majored in Teaching English to Speakers of other Languages (TESOL) at the undergraduate or graduate level.

Analytical dataset. I combine several data files to build the analytical dataset. Student information comes from yearly elementary school (grades 3-5) and middle school (grades 6-8) data files that include student demographic and achievement information, course identifiers, classroom peer identifiers and peer information, and teacher identifiers used to match students to their teachers. Using these files I identify classroom rosters and classify each student as a CEL, REL, or NES. After combining the elementary and middle school files for each year, I merge in school level data from annual school level files. Afterwards, I combine student and school information from each school year to construct an analytical file that contains pooled information for students and schools in the NC public school system in grades 3 to 8 during the study years.

Teacher information, including demographic information, credentialing, preparation, and test scores, comes from various files provided by either NC DPI or the UNC GA. Key to my study is whether or not a teacher has a credential to teach Els and their experience teaching Els. Using a comprehensive licensure file, which provides information on the licensure areas and status for all teachers who have worked in NC public schools since 2002, I identify the teachers who were employed as a teacher during the study years and who ever had an ESL license (i.e., credential). This is possible by searching through the licensure area codes for any of three codes that indicate that teachers has a license for teaching ESL: “24110: English as a Second Language for grades K-6”, “1600: Elementary Second Language Endorsement for grades K-6”, or “110: English as a Second Language for grades K-12”.

I identify teachers as having experience teaching Els if they taught at least 2 Els the year before. Following Master et al. (2012), I create this cut off based on the average number of Els a teacher in North Carolina taught over the study period.

I combine all files into one teacher information file, and then merge that with the student and school file to create an analytical data set with information for students, teachers, and schools, in the NC system from 2006-2007 to 2012-2013.

I limit the analytical sample to grades 3-8 because 1) Els in grades pre-Kindergarten -2 are not identified in the data set, and 2) students grades 3-8 take vertically aligned End-of-Grade math and reading standardized tests that allow for straightforward comparisons of achievement across grades. Because I am interested in comparing how the classrooms of Els impact their achievement, and not in comparing the achievement of Els to NESs, I drop all students who were never an El from the sample after creating all variables and conducting descriptive analyses. Finally, regression analyses are limited to the 2008-2009 - 2012-13 school years as student level data can only reliably be linked across these years.

Identifying courses. This study focuses on the impacts of academic classroom contexts on El achievement. I categorize academic classes as any English Language Arts (ELA), English as a Second Language (ESL), math, or self-contained course and exclude science, social studies, music, art, vocational education, and health/physical education courses from the sample.

All courses in North Carolina have a corresponding course number that identifies the discipline, academic level, grade level, and length of the course. Math courses are identified with the codes "20" or "24" for general education students, ELA courses with the code "10", self contained classes with the code "0", and ESL courses the code "1038". While these codes identify the majority of classes, there are a non-trivial number of classes that are miscoded or coded differently. For instance, the "1038" ESL code does not identify many sheltered ESL classes[9] that are primarily coded according to their corresponding discipline such as math, English, Science, or Social Studies. To recover alternatively coded math, ELA, self-contained, or ESL classes, I searched course titles for content related terms. For math, these terms included "geometry", "statistics", "algebra", "math", etc. I searched for terms such as "SIOP", " sheltered", "ESL", and "newcomer", "as a" (I had to omit terms such as "English" or "language" because those would misidentify regular English or foreign language courses), and "LEP" to identify ESL classes. For language arts, I searched for terms such as "reading", "writing", and "communication".

At the end of this search I identified four types of courses: Math, ELA courses, ESL, and self-contained. All students have a math and ELA course, and a fraction of students have ESL or self-contained courses. Students in elementary school are typically enrolled in a self-contained

[9] Sheltered instruction is a model of English language development that integrates academic content and language instruction.

course and both a math and language arts course. Further inspection revealed that the same class (i.e., group of students with a teacher) was triple coded as a self-contained, math, and language arts course. These students are most likely in the same class throughout the day with periods for these specific subjects. When I found this pattern, I kept the observations from the math and language arts courses, and dropped the duplicated data from the self-contained course.

In middle school students are often enrolled in more than one math or language arts course. These additional courses are generally remedial courses or additional at-grade-level courses (Barrett & Henry, 2014). To accurately construct segregation measures, it is necessary that students have only one observation per subject (Clotfelter, Ladd, & Vigdor, 2006). Thus, when a student had more than one course in either subject, I dropped the course(s) that I could identify as remedial or for enrichment purposes. When these designations were not clear, I assumed that smaller classes were for remediation and dropped the class with the fewest number of students. In the event that each class had the same number of students, I kept the class with the highest average achievement. I divided the full sample into math and ELA subsamples for analyses. The math sample includes all Els and teachers in math classes and ESL classes and the ELA sample includes all Els and their teachers in ELA and ESL classes.

Measures

Measures of segregation: I use several measures, listed below, to answer the first research question and assess the extent to which Els are segregated from NESs.

Exposure. Exposure measures contact between Els and NESs in their classroom and is calculated using the formula shown in Equation 4:

$$\text{Exposure} = \frac{\#\ \text{NES}}{(\text{Total Class}\ \# - 1)} \tag{4}$$

Exposure is a classroom level measure that indicates the proportion of student A's peers who differ from him or her according to some attribute. Specifically, in this study exposure refers to the average proportion of an El's classroom peers who are native English speakers.

Singleton classroom. A dichotomous variable indicating a class in which there is only one El and so that student only has NES peers. Exposure in such a class is 1.

Segregated classroom. A dichotomous variable indicating a class in which all of the students are Els and so students do not have any NES peers. Exposure in such a class is 0.

Mainstream classroom. A dichotomous variable indicating a class in which exposure is above 0 and below 1. This means that there are at least 2 Els and at least 1 NES in mainstream classes. This variable serves as the base group in regression analyses.

Class CEL percent. Indicates the percent of students in a class who are CELs.

Class REL percent. Indicates the percent of students in a class who are RELs.

Unevenness. Unevenness describes how well the demographic composition of a smaller unit (e.g., class, school) reflects the composition of the larger unit in which it is located (e.g., school, district). As unevenness increases, students are more concentrated with peers who are like them. The level of unevenness provides evidence regarding the extent to which schools group students who are similar to one another. In this study I report on 3 measures of unevenness: Within-school Unevenness, Between-school Unevenness, and Total Unevenness. The details of how these variables are constructed are presented in Appendix A.

Within-school unevenness indicates the distribution of Els across classrooms within one school. More specifically, within-school unevenness measures the percentage gap between the actual probability that an El will encounter a NES in their class and the estimated probability if all classrooms were perfectly integrated within the school.

Between-school unevenness indicates the distribution of Els across schools in one district. More specifically, between-school unevenness measures the percentage gap between the actual probability that an El will encounter a NES in their school and the estimated probability if all schools were perfectly integrated within the district.

Total unevenness: indicates the distribution of Els across classrooms in one district, and is equal to the sum of within-school and between-school unevenness. Total unevenness measures the percentage gap between the actual probability that an El will encounter a NES in their class and the estimated probability if all classrooms were perfectly integrated within the district.

Measures of ESL training. Research Question 2 is focused on how often Els are taught by a trained ESL teacher, indicated by whether a teacher has an ESL credential and alternatively, whether the teacher has experience teaching an El. In addition to these two indicators of teacher quality, several other common indicators of "teacher quality" are used to describe the teachers of ELs and used in regression models as controls.

ESL credentialed teacher**.** Whether a teacher has earned an ESL certification during pre-professional training or while teaching will be indicated by a value of one on a dichotomous variable. In North Carolina, a teacher can earn this credential by having a regular license in another area and the taking and passing the Praxis II Teaching English to Speakers of Other Languages exam. This measure serves as a proxy for how prepared a teacher is to teach Els as well as whether a teacher is a caring institutional agent. As a proxy for rather murky constructs, certification is limited. One can imagine a scenario where a teacher became ESL certified but has not had any substantial experience working with Els and so is still underprepared.

El experienced teacher. To address the limitation related to using ESL certification as a proxy for whether a teacher is an institutional agent, I also include an alternative measure, whether the teacher has taught at least 2 Els in the previous year, with first year teachers necessarily having a value of zero. Following Master and his colleagues (2014), I used the mean number of Els in taught by all teachers in North Carolina across study years to create the cut-off. As the cut-off is rather arbitrary, I test multiple thresholds in sensitivity analyses (see Appendix C). A limitation to this measure is that it does not capture the influence of having multiple years of experience. Such a measure is not possible to create using this data, as indications of teacher experience with Els do not exist before 2004-2005. Another limitation is that teachers who had experience teaching Els in grades K-2 in the previous year cannot be identified because Els are not identified in the data in those grades.

Total years of experience. A continuous variable indicating a teacher's total years of experience. Experience is one of the only characteristics that empirical research has consistently shown to have an impact on student achievement and so is included in order to better indicate whether Els have access to "quality" teachers.

***New teacher*.** This variable measures whether a teacher is in her first three years of teacher and is indicated by a dichotomous variable.

Teacher's average test score. A continuous variable that measures each teachers average achievement on any available standardized achievement exam (including GRE, Praxis,

Praxis II, SAT, National Teaching Exam). This measure is standardized across teachers and so indicates deviations from the mean of all teachers.

Measures used for comparisons. The first two research questions compare variables across time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles. Indicators of these variables are listed and described below.

Time. A series of dichotomous variables indicating each year from 2009-2010 to 2012-2013. 2008-2009 serves as the base group for comparison. Each variable represents one academic year beginning in the fall and ending in the spring.

School level. A dichotomous variable where 1 indicates an elementary school and 0 indicates a middle school. Schools are categorized as an elementary school if they include grades 3-5 and as a middle school if they include grades 6-8. For schools that include a combination of grades (e.g., a K-8 school) the following decision rules are used to categorize schools. If the school includes Kindergarten – 4^{th} grade and any grade 6-8, it is categorized as an elementary school. If a school includes 5^{th} grade and any grade 6-8, it is categorized as a middle school.

Urbanicity. Urbanicity is a measure of population density and is indicated by three dichotomous variables: Rural, Urban, and Suburban. Urbanicity is a district level measure.

Rural. Rural districts are located in areas designated as rural-fringe, rural-distant, and rural remote by the National Center for Education Statistics (NCES).

Urban. Urban districts include the 5 largest school districts: Durham Public Schools, Forsyth County Public Schools, Guilford County Public Schools, Charlotte-Mecklenburg Public Schools, Wake County Public Schools.

Suburban. Suburban districts include schools not located in urban or rural areas.

School El concentration. Schools are categorized as having a high, medium, or low concentration of Els according the percentage of their population that are Els. Schools with no Els are excluded from this analysis.

High Concentration. High concentration schools include those where 30% or more of students are Els.

Medium concentration. Medium concentration schools include those where 11-29% of students are Els

Low concentration. Low concentration schools include those where less than 10% of the students are Els

Immigrant growth profile. I adapt the typologies created by Dondero and Mueller (2012) and Fischer (2010) to categorize schools into four immigrant growth profiles. I use the following rules to create categories:

New Destination school: Schools who were in the bottom 50% of school El enrollment in 2000 and that are in the top 50% of growth in the number of Els from 2000-2013

Established and Growing school: Schools who were in the top 50% of school El enrollment in 2000 and that are in the top 50% of growth in the number of Els from 2000-2013.

Established and Stable schools: Schools who were in the top 50% of school El enrollment in 2000 and that are in the bottom 50% of growth in the number of Els from 2000-2013.

Low Incidence schools: Schools who were in the bottom 50% of school El enrollment in 2000 and that are in the bottom 50% of growth in the number of Els from 2000-2013. Schools with less than a 5% El population in 2012-2013 are also included in this category.

Covariates. The theoretical framework presented in Figure 5 delineates measures to be included in models estimating the relationship between classroom contexts and student achievement in order to control for non-random sorting of students into classrooms and schools. All time varying and time invariant covariates listed below are included in OLS regression models, and a subset of time varying covariates are included in the models with fixed effects.

Student Characteristics.

Prior test scores. A continuous variable measuring each student's prior year standardized test score. This variable is standardized by subject, grade, and year to have a mean of 0 and standard deviation of 1. Prior achievement controls for all prior year unobserved school and family inputs as well as a child's innate ability.

Gender. A dichotomous variable where 1 indicates a student is a female.

Race/ethnicity. A series of dichotomous variables where 1 indicates that a student is Black, Latino, Asian, or "Other" (American Indian or Asian-Pacific Islander). White serves as the base group in all models.

Gifted. A dichotomous variable where 1 indicates that a child is identified as gifted.

Disability. A dichotomous variable where 1 indicates that a child has a physical or learning disability and is identified as needing special support.

Structural mobility. A dichotomous variable where 1 indicates that a child moved to a new school between school years because of a change in school level.

Within year mobility. A dichotomous variable where 1 indicates that a child changed schools within one school year.

Between year mobility. A dichotomous variable where 1 indicates that a child was enrolled in a different school in the prior year and moved to a new school not for structural reasons.

Days absent. A continuous variable that indicates how many days a student was absent in the current school year.

Overage for grade. A dichotomous variable used as a proxy indicator of whether a student was held back a grade. This variable is constructed using date of birth and the enrollment cut off date of October 16th. Students are overage if their birthday occurs more than one year after the cut off date for their grade level.

Underage for grade. A dichotomous variable used as a proxy indicator of whether a student skipped a grade. Constructed using date of birth and the enrollment cut off date of October 16th. Students are underage if their birthday occurs before the cut off date for their grade level.

Poverty status. A dichotomous variable where 1 indicates that a student is eligible for free or reduced price meals in schools.

Years as CEL. A continuous variable indicating how many years a student has been classified as a Current El.

Mover. A dichotomous variable where 1 indicates that a student has 1 or more non-continuous observations. (i.e., they are in the dataset for 3rd grade, 5th grade, and 8th grade)

Exiter. A dichotomous variable where 1 indicates that a student has only 1 observation.

Class characteristics.

Class size. A continuous variable indicating the number of students in one classroom.

Advanced curriculum. A dichotomous variable where 1 indicates that a course uses an advanced curriculum.

Remedial curriculum. A dichotomous variable where 1 indicates that a course uses a remedial curriculum.

Peer achievement: A continuous variable indicating the average standardized peer score for each student in their math or ELA course, calculated using Equation 5:

$$\text{Avg. Peer Achievment} = \sum_{p}^{k} \frac{Std.Score_p}{n-1} \qquad (5)$$

Where *p* indexes each student's classroom peers, *k* represents the number of peers a student has in their class, and *n* represents the total class size.

ESL course. A dichotomous variable where 1 indicates that a course is specifically designed to teach Els. These include ESL courses, SIOP courses, and Sheltered Content area courses.

Teacher average test score. Described above.

Teacher experience. Described above.

New teacher. Described above.

School Characteristics.

School size. A continuous variable indicating the number of students in a school. A squared measure is also included to allow for a non-linear relationship between school size and achievement. This variable is measured in hundreds of students.

Total per-pupil expenditures: A continuous variable indicating the total amount of money allocated to the average student in each school. This variable is measured in hundreds of dollars.

District Title III funding. A continuous variable indicating the total amount of Title III dollars allocated to a particular district.

Proportion of minority students. A continuous variable that indicates the proportion of minority students in each school (i.e. Black, Latino, American Indian, Asian-Pacific Islander).

Proportion of low-income students. A continuous variable that indicates the proportion of students eligible for free and reduced price lunch.

Proportion of certified teachers. A continuous variable that indicates the proportion of teachers in each school that has earned a full credential in any area.

Proportion teachers certified in ESL. A continuous variable that indicates the proportion of teachers in each school that has earned an ESL credential.

Proportion same race teachers. This variable describes a student's co-ethnic community and is indicated by a continuous variable measured from 0 to 1 that gives the proportion of teachers of a given race in each school. The value for each student will depend on the student's race or ethnicity. For instance, the value of this variable for a Latino student will be the proportion of Latino teachers in the school and the value for a Black student will be the proportion of Black teachers in the school. To assist the interpretation of interactions, this variable is centered at the group mean for each study year.

Offers bilingual or heritage language instruction. This measure indicates the presence of a supportive school structure and is indicated by a value of one on a dichotomous variable. Schools that offer bilingual programs are identified using a list provided by the NC DPI annually. Heritage language programs are identified using course code and course titles. The course code for foreign languages is “10”. Terms within course titles that indicate that a foreign language course is intended for heritage language speakers (i.e., native speakers of that language) are “heritage”, “Spanish for Native”, “Mandarin for Native”, etc.

Proportion El students in School. This measure describes the size of a student’s co-ethnic community and is indicated by a continuous variable measured from 0 to 1 that gives the proportion of students who are or were ever classified as an EL enrolled in the school at time *t*. To assist interpretation of interactions, this variable will be centered at the state mean for each study year.

Urbanicity. Described above.

Immigrant growth profile: Described above.

Analytic Plan

The following models estimate the relationship between classroom contexts and El achievement controlling for student, class, and school characteristics. I describe each model as well as its strengths and limitations.

Model 1: OLS regression.

$$\boldsymbol{Y_{ijst} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 ESLCred_{ijst} + \beta_3 ElExperience_{ijst} + \beta_4 Segregated_{ijst} + \beta_5 Singleton_{ijst} + \beta_6 X_{it} + \beta_7 C_{jt} + \beta_8 S_{st} + \epsilon_{ijst}} \tag{6}$$

Where $\boldsymbol{Y_{ijst}}$ is student i's math or reading End of Grade standardized test score in class *j* in school *s* and year *t*, $\boldsymbol{Y_{it-1}}$ is student *i*'s prior year achievement, $\boldsymbol{Treatment_{ijst}}$ is a vector of treatment variables, $\boldsymbol{X_{ijst}}$ is a vector of student characteristics, $\boldsymbol{C_{ijst}}$ is a vector of classroom characteristics, $\boldsymbol{S_{ijst}}$ is a vector of school characteristics, and $\boldsymbol{\epsilon_{ijst}}$ is a random error term.

Model 1 does not include student or school fixed effects, but rather includes a robust set of student, classroom, and school time invariant and time varying characteristics as controls. Standard errors are clustered at the school level to address the within-school correlation of student error-terms. Estimating the model without fixed effects allows me to exploit maximum variation within and across schools in classroom contexts. In the case that sorting of students into schools and classrooms is based on the covariates included in the model, particularly the prior achievement of the student and his or her peers, including the controls mitigates omitted variable bias. However, its weakness is that it does not control for any unobserved variables that are correlated with assignment to treatment and the outcome after including controls.

Model 2: Regression with school fixed effects.

$$\boldsymbol{Y_{ijst} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 ESLCred_{ijst} + \beta_3 ElExperience_{ijst} + \beta_4 Segregated_{ijst} + \beta_5 Singleton_{ijst} + \beta_6 X_{it} + \beta_7 C_{jt} + \beta_8 S_{s} + \theta_s + \epsilon_{ijst}} \tag{7}$$

In this model, I introduce a school fixed effect, indexed by $\boldsymbol{\theta_s}$. This model improves on the last model by controlling for any unobserved school level variable that does not vary across students, such as the quality of the school leadership or the availability of a bilingual translator.

One limitation of this model is estimates of the effect of school context variables are based on schools that have variation for that variable. For instance, the estimate of the effect of whether the impact of a school having a bilingual program is limited to a sample of schools that either began or ended a bilingual program during the years of the study. This model accounts for non-random sorting of students and teachers into schools but does not protect from bias caused by non-random sorting of students and teachers into classrooms that is not addressed by including controls.

Model 3: Regression with student fixed effects.

$$Y_{ijst} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 ESLCred_{ijst} + \beta_3 ElExperience_{ijst} + \beta_4 Segregated_{ijst} + \beta_5 Singleton_{ijst} + \beta_6 X_{it} + \beta_7 C_{jt} + \beta_8 S_{st} + \gamma_i + \epsilon_{ijst} \quad (8)$$

Model 3 includes a student, rather than a school, fixed effect, represented by γ_i. This model controls for all time invariant characteristics of a student that are related to assignment to treatment and the outcome after including the controls. The student fixed effect constrains the sample in a more drastic and different way than the school fixed effect by necessitating at least two observations for each student as well as variation in treatment condition within a student to estimate the treatment effect. Students who do not have variation in the treatment are not identified in the estimation of the treatment effect.

Model 4: Regression with school and student fixed effects.

$$Y_{ijst} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 ESLCred_{ijst} + \beta_3 ElExperience_{ijst} + \beta_4 Segregated_{ijst} + \beta_5 Singleton_{ijst} + \beta_6 X_{it} + \beta_7 C_{jt} + \beta_8 S_{s\square} + \theta_s + \gamma_i + \epsilon_{ijst} \quad (9)$$

Model 4 includes both a student and school fixed effect, which creates a comparison of achievement within a student under various treatment conditions in years when a student was enrolled in a particular school. This model provides the most protection from potential bias caused by unobserved characteristics of the student and school that are not accounted for by the inclusion of controls. However, it further constrains the sample to students who have attended the same school for at least two years during the study period and who have variation in the treatment in years when they attended a particular school. If a student switches from having an ESL certified teacher to one who is not ESL certified only after they transfer to a different school, they are not included in the estimation of the effect of having an ESL certified teacher.

Interactions: Models 1-4.

To investigate whether the effect of being in a segregated class differs for students who are or are not taught by credentialed or experienced ESL teachers (Research Question 3.C) I interact both segregation variables with both ESL training variables. I re-estimate each of the four models presented above using these terms. Equation 10 shows the OLS model including interactions.

$$\begin{gathered}\boldsymbol{Y_{ijst} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 ESLCred_{ijst} + \beta_3 ElExperience_{ijst} +} \\ \boldsymbol{\beta_4 Segregated_{ijst} + \beta_5 Singleton_{ijst} + \beta_6 ESLCred * Segregation_{ijst} + \beta_7 ESLCred *} \\ \boldsymbol{Singleton_{ijst} + \beta_8 ElExperience * Segregation_{ijst} +} \\ \boldsymbol{\beta_9 ElExperience * Singleton_{ijst} + \beta_{10} X_{it} + \beta_{11} C_{jt} + \beta_{12} S_{st} + \epsilon_{ijst}}\end{gathered} \tag{10}$$

Where the individual terms are defined as in Model 1.

The purpose of estimating all of the models described above is to derive a sense of the effect of the treatment variables in different contexts. Each model has benefits and limitations, and together the results provide a bound for the possible effect ESL credentialing and classroom exposure to NESs has on student achievement. Each model is estimated with differing subpopulations, which can confuse the interpretations of findings. After identifying the subsample that is used in estimating model 5, which is the most restrictive, I will re-run all of the models using this restricted subsample to verify if any differences in results are due to differences in the subpopulation or differences in the estimation strategy (See Sensitivity Analysis in Appendix C).

Limitations

One limitation to my methods is that including prior achievement in a model as well as using student fixed effects requires multiple years of data for each student. Models with both student and school fixed effects require that a student have multiple observations within the same school. English learners and Latinos (who make up the majority of Els) tend to have higher mobility rates than other students (Gandara & Contreras, 2009). Mobility between schools or in and out of North Carolina public schools can cause selection bias: students who remain in the sample for several years are likely to be different than those who leave the sample. While I include controls in my models indicating whether a student is a mover or exiter to mitigate this bias, I also conduct t-tests to compare “exiters”, “movers”, and “stayers” in order to better understand how mobility is related to achievement (results presented in Appendix C). Exiters include Els who have only 1 year of data. Movers include Els who have multiple years of data but whose enrollment in North Carolina schools is not continuous (i.e., they are in the dataset for 3rd grade, 5th grade, and 8th grade). Stayers include Els who have at least 2 years of continuous data. Understanding differences between exiters and the other two groups will be important in interpreting and generalizing my results.

Another limitation is the arbitrary nature of the two student minimum threshold for considering a teacher “El experienced”. While this number is based on prior literature and the current average class size for Els in the sample, it is not an intuitive cut-off and may influence results dramatically. To address this limitation I test whether results are robust to different thresholds. The alternatives I test are thresholds at 1, 3, or 6 students. Findings are presented in Appendix C.

The questionable validity of the outcome measure presents a third limitation. Using achievement tests as a surrogate measure of English proficiency is problematic because standardized assessments of the content areas (e.g. language arts, math, science) are typically not validated for use as a measure of English proficiency (Abedi, 2008). Abedi and Liquanti (2013) explain a number of validity concerns including that standardized content exams are typically normed and field-tested on native English speakers, test questions use unnecessarily complicated grammatical structures and vocabulary, and Els typically receive language support and other accommodations when taking academic achievement exams. Additionally, Els who are enrolling in an American public school for the first time and have low English proficiency are exempt from taking the English EOC during their first year of schooling in North Carolina.

Els in North Carolina do take the WIDA, a valid and reliable test of English proficiency. Scores on the WIDA exam describe a student’s language proficiency in each of the four language domains: reading, writing, speaking, and listening, on scale from one to five. Scores on these tests are used for identification and reclassification purposes and would be the ideal measure of EL achievement. However, this data is as yet unavailable for analysis. Findings from this study should be interpreted with this limitation in mind, and future researchers should replicate this study using outcomes from the WIDA exam when that data becomes available.

CHAPTER IV

RESULTS

In Chapter 4 I present results of descriptive and regression analyses that address the three research questions posed above. The first section documents the extent to which ELs are segregated from native English speakers as well as trends in how segregation has changed over time. The second section describes the extent to which Els have access to ESL credentialed or El experienced teachers and how that access has changed over time. The third section describes the variables that are included in the subsequent regression analyses. Summary statistics are presented that compare characteristics of students who are either currently learning English (CEL) or who have already reclassified (REL), as well as for both groups of students when they are in elementary or middle school. This section is followed by the results of analyses that provide evidence to support or discredit the hypotheses listed in Chapter 2. I conclude this chapter with a brief summary of the results.

Segregation of English Learners from Native English Speakers

The first questions posed were: To what extent are Els segregated from native English speakers within their math and language arts classes? How does segregation vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles? To answer these questions I present descriptive results concerning how segregation in ELA classes varies across urbanicity, immigrant growth profile, school concentration of Els, and school level in the most recent year of this study, 2012-13. Next, I look across all the years of the study, from 2006-2007 to 2012-2013, to see how patterns of segregation have changed over time. Segregation tends to be slightly elevated in ELA compared to math, but generally the same trends exist in both course types. To avoid redundancy, I report the findings for ELA and note where math results diverge substantively.

CELs and RELs have dramatically different achievement outcomes, have dissimilar background characteristics, and tend to be in very different classrooms settings (as will be described in more detail below). As such, I disaggregate all results by El status (CEL or REL). Moreover, to get a sense of how CEL and REL classrooms compare to the classroom settings of native English speakers (NES), I also include results for NES where appropriate.

Differences in segregation for CELs, RELs, and NESs. The general conclusion from across all of the measures of class and school segregation is that Els, both current and reclassified, are largely integrated with native English speakers in their classrooms. This reflects what one might expect given the relatively small population of Els in most schools. However, there are important differences in the extent to which CELs and RELs are segregated across classrooms and schools.

In 2012-13, CEL exposure to NES is 72%, meaning that the average CEL is enrolled in a class where about three quarters of his or her peers were NESs (Table 11). Less then 10% of CELs' classmates are RELs. About a quarter of the students in the average CEL's class (including that CEL) are currently learning English, in contrast to about 8% of REL's and 7% of NES's. On average there were about 22 students in the average ELA class 2012-13. Thus, in real terms, the average CEL is in a class with about 5 other CELs, 1 REL, and 16 NESs.

Table 8 ***Summary of Segregation Measures by El Status, ELA, 2012-13***

	CEL	REL	NES
Exposure	0.72	0.79	0.90
	(0.24)	(0.17)	(0.11)
Class CEL %	0.25	0.08	0.07
	(0.22)	(0.10)	(0.09)
Class REL %	0.07	0.17	0.07
	(0.09)	(0.11)	(0.08)
Segregated Class	0.04	0.00	0.00
	(0.20)	(0.05)	(0.00)
Singleton Class	0.08	0.10	0.31
	(0.27)	(0.30)	(0.46)
Within-School Unevenness	0.12	0.07	.
	(0.09)	(0.02)	.
Across-School Unevenness	0.06	0.03	.
	(0.04)	(0.02)	.
Total Unevenness	0.18	0.10	.
	(0.09)	(0.03)	.
N	38150	36668	376770

Math Results available in Table B1 in Appendix B.

RELs tend to be more exposed to NESs: in 2012-13, nearly 80% of their classmates were NESs and only 8% were CELs. This result indicates that when students reclassify, they are more likely to enroll in the same types of classes as their NES peers than when they were still learning English. That being said, the average REL is in a class with a greater proportion of Els than the average NES. In total, the proportion of Els in the average REL's class is 25% (17% REL and 8% CEL) and the proportion of Els in the average NES's class is 14% (7% REL and 7% CEL). This pattern indicates that even after reaching English proficiency and reclassifying, RELs are not assigned to ELA classes in the same way as NESs.

Both CELs and RELs are more likely to be in a singleton class than a segregated class. Approximately 9% of Els, or about 6,700 students, are in singleton classes; on the opposite end of the spectrum, less then 5% of CELs, which represents about 1,500 students, and no RELs are in segregated classrooms. The low percentage of students in this type of environment for reading instruction is consistent with state policy that encourages, although does not mandate, mainstreaming Els (Smith, 2014). In mainstream settings, as opposed to “pull out” settings, Els are purposefully integrated with their NES peers.

The total classroom segregation of CELs from NES is about 18% which is interpreted to mean that a CEL has an 18% lower probability of encountering an NES in his or her classes than if the composition (in terms of % CEL and % NES) of both his class and school were equal to the composition of the district. 6% of total segregation for CELs is due to between-school unevenness, meaning that CELs are 6% less likely to encounter an NES in their school than they would be if the school composition perfectly reflected the district composition.

Finally, within-school unevenness, which is the measure used in subsequent regression analyses, is about 12% for CELs. Within-school unevenness is interpreted as the percent difference between the true probability of encountering an NES and the probability that would exist if classroom composition perfectly reflected school composition. Taken together, these three measures tell us that a larger proportion of the total segregation of CELs from NESs is due to within-school unevenness as opposed to across school segregation. That is to say, CELs are more evenly distributed across schools within districts than across classrooms within schools.

The same pattern emerges for RELs, however each measure is lower and closer to perfect integration (indicated by 0). This confirms what was suggested by the exposure measures: RELs are better integrated than CELs, although there is evidence that RELs are non-randomly sorted into classrooms within schools.

To get a sense of the magnitude of how segregated Els are from NESs, Table 12 shows unevenness measures for Black, Latino, and low-income students. These three groups are the most segregated in North Carolina and in many schools across the country (Orfield & Lee, 2005; Conger, 2005). To be clear, the segregation measures are created assuming a binary classroom composition; e.g., measures indicate segregation of Black students from non-Black students, Latinos from non-Latinos, and poor students from non-poor students.

For Black, Latino, and low-income students across school segregation is equal or greater than within-school unevenness. This means that Black, Latino, and poor students are more likely to be concentrated within particular schools rather than in particular classes in schools, as is the case for Els. In North Carolina, total segregation is lower for all groups compared to the segregation that has been described in other states (Conger 2005, 2012).

Table 9 ***Unevenness of Black, Latino, and Low-Income Students, ELA, 2012-13***

Segregation	Mean (SD)
Low-income	
Within-school Unevenness	0.09
	(0.04)
Between-school Unevenness	0.13
	(0.11)
Total Unevenness	0.22
	(0.10)
Latino	
Within-school Unevenness	0.07
	(0.03)
Between-school Unevenness	0.07
	(0.06)
Total Unevenness	0.13
	(0.06)
Black	
Within-school Unevenness	0.07
	(0.03)
Between-school Unevenness	0.11
	(0.09)
Total Unevenness	0.18
	(0.09)
Observations	618103

Note: Sample includes all students in ELA classes in grades 3-8.

Variation in segregation across urbanicity. Many large-scale studies of segregation focus on urban areas (Orfield, Kucsera, & Siegel-Hawley 2012; Orfield & Lee, 2005). While these studies are informative, the majority of schools in North Carolina are located in rural areas. Additionally, many rural and suburban districts have been sites of rapid growth in the El population (Wepner, et al, 2012).

Table 13 shows the how segregation varies for RELs and CELs across urban settings. Differences in exposure between the two El groups are slightly larger in urban areas (8% difference) then in rural or suburban areas.

Table 10 ***Summary of Segregation Measures by Urbanicity and El Status, ELA, 2012-13***

	Current El			Reclassified El		
	Urban	Rural	Suburban	Urban	Rural	Suburban
Exposure	0.70	0.75	0.77	0.78	0.80	0.83
	(0.23)	(0.23)	(0.20)	(0.16)	(0.18)	(0.14)
Segregated	0.04	0.03	0.02	0.00	0.00	0.00
	(0.19)	(0.17)	(0.15)	(0.05)	(0.06)	(0.05)
Singleton	0.06	0.10	0.12	0.07	0.12	0.11
	(0.23)	(0.30)	(0.32)	(0.25)	(0.33)	(0.32)
Within-school Unevenness	0.11	0.11	0.13	0.07	0.07	0.07
	(0.06)	(0.07)	(0.08)	(0.01)	(0.03)	(0.03)
Between-school Unevenness	0.08	0.05	0.02	0.02	0.04	0.01
	(0.04)	(0.04)	(0.02)	(0.01)	(0.03)	(0.01)
Total Unevenness	0.19	0.16	0.15	0.10	0.11	0.09
	(0.07)	(0.08)	(0.08)	(0.02)	(0.04)	(0.04)
Class CEL %	0.26	0.22	0.22	0.08	0.07	0.06
	(0.22)	(0.20)	(0.18)	(0.10)	(0.10)	(0.09)
Class REL %	0.08	0.07	0.06	0.17	0.17	0.16
	(0.09)	(0.10)	(0.08)	(0.11)	(0.12)	(0.11)
N	163620	196675	35015	163620	196675	35015

Math Results available in Table B2 in Appendix B.

While CELs in any setting are unlikely to be in segregated classrooms, about 4% of CELs are in this setting in urban areas. While still only a small proportion, this is double the proportion of CELs in segregated classrooms than are found in suburban areas. Both El sub-groups are least likely to be in singleton classrooms in urban areas.

The unevenness measures suggest that the distribution of CELs is less even in suburban areas compared in rural or urban areas. In all settings, within-school Unevenness is greater than between-school Unevenness. However, the magnitude of this difference is greater in suburban schools where 85% (.13/.15) of total segregation is due to unevenness within schools. In rural areas it is about 69% and in urban areas this figure is about 58%. These differences are significant because they suggest that for CELs, urbanicity is related to how they are assigned to classrooms. For RELs there is little difference in between, within, and total unevenness indicators across different urbanicities.

Variation in segregation across schools with different concentrations of Els. As is to be expected, the higher the concentration of Els in a school, the lower the exposure of Els to NESs (Table 14). There is a relatively large discrepancy in exposure between RELs and CELs in medium concentration schools (about 7%). This discrepancy is smaller in high concentration schools and all but disappears in low concentration schools. While the school population clearly influences the level of exposure that is possible, there is evidence that even in high concentration schools CELs and RELs are sorted into classes with similar peers. For instance, in high concentration schools 53% of CEL's peers are NES. However, in these same schools, about 60% of the population is NES. If students were distributed in classes according to their representation in schools, these two numbers would be equivalent.

The proportion of CELs in segregated ELA classrooms increases as the school El population increases. This might be explained by the fact that high concentration schools have greater capacity to provide specialized instruction to Els in what are likely "pullout" settings. This specialized instruction seems to only be for ELA. The difference in the proportion of students in segregated math classrooms does not deviate from the overall state average, around 1 to 2%, in schools with different concentrations of Els.

Further evidence that high concentration schools have increased capacity to support Els is presented in Table 13. Fourteen percent of Els attending high concentration schools have access to bilingual or heritage language courses, as opposed to around 7% in medium concentration schools and 2% in low concentration schools. Students in high concentration schools are also the most likely to be taught by a teacher with an ESL credential or with El experience. That being said, in high concentration El schools, only 6% of students are taught by a credentialed teacher. More than double and nearly triple the proportion of students, in medium and high concentration schools respectively, are taught by a teacher with El experience compared to students in low concentration schools.

Table 11 ***Summary of Segregation Measures by School El Concentration and El Status, ELA, 2012-13***

	Current El			Reclassified El		
	High	Medium	Low	High	Medium	Low
Exposure	0.53	0.74	0.91	0.59	0.81	0.93
	(0.21)	(0.21)	(0.13)	(0.16)	(0.12)	(0.08)
Segregated	0.06	0.05	0.01	0	0	0
	(0.23)	(0.21)	(0.11)	(0.06)	(0.05)	(0.05)
Singleton	0	0.04	0.30	0.01	0.05	0.30
	(0.07)	(0.20)	(0.46)	(0.07)	(0.22)	(0.46)
Class CEL %	0.39	0.23	0.11	0.17	0.07	0.02
	(0.23)	(0.21)	(0.13)	(0.14)	(0.08)	(0.04)
Class REL %	0.11	0.07	0.03	0.28	0.16	0.09
	(0.12)	(0.08)	(0.04)	(0.13)	(0.09)	(0.07)
School CEL %	0.28	0.11	0.03	0.23	0.08	0.02
	(0.12)	(0.05)	(0.02)	(0.08)	(0.04)	(0.01)
School REL %	0.15	0.09	0.03	0.19	0.1	0.04
	(0.07)	(0.04)	(0.02)	(0.06)	(0.04)	(0.02)
N	41649	226806	183133	41649	226806	183133

Math Results available in Table B3 in Appendix B.

Both current and reclassified Els are more likely to be in singleton classes in low concentration schools than in medium or high concentration schools. In low concentration schools, nearly a third of Els are in singleton classrooms. Very likely, this is due to the small overall population of Els in low concentration schools. In thinking about the classroom experiences of Els, it is important to remember that none of the peers of Els in singleton classrooms are also classified as English learners. The impact of this remains to be seen: perhaps the peer effects improve achievement, or perhaps teacher ambivalence and lack of specialized support hinder achievement.

Table 12 ***Description of Resources to Support Els, by School El Concentration***

	Low	Medium	High	Total
ESL Credential	0.01	0.04	0.06	0.04
	(0.11)	(0.19)	(0.23)	(0.19)
El Experience	0.27	0.58	0.66	0.54
	(0.44)	(0.49)	(0.47)	(0.50)
%Teacher Same Race	0.07	0.05	0.03	0.07
	(.23)	(.18)	(.11)	(.18)
Bilingual/Heritage	0.02	0.07	0.14	0.07
	(0.15)	(0.25)	(0.35)	(0.26)
Observations	74818			

Note: Sample restricted to El students. Table reads 1% of Els in Low concentration schools are taught by a teacher with an ESL credential.

When looking across schools with different El concentrations, unevenness measures are inappropriate[10]. Instead, I approximate unevenness by comparing the school and classroom concentrations of Els. In all cases, the percent of ELs in a class is higher than the school percent El. The difference is slightly higher in medium concentration schools compared to high or low concentration schools. The discrepancy between classroom and school proportion of Els is consistent with the findings that Els are more segregated within schools; however, this does not describe segregation between schools. To approximate between-school unevenness, I compare the proportion of each type of school and the proportion Els enrolled in each type of school.

In 2012-13, 586 of the 1,278 schools (46%) in the sample were medium concentration

[10] The segregation Indices are calculated by comparing schools and classrooms within a particular district. When disaggregating across school characteristics, such as El concentration and destination type, schools from many districts are grouped together and measures are averaged across the different segregation indices. This process renders these measures nonsensical because segregation indices are based on the particular distribution of students in a district and so results are not reported.

schools, 559 (44%) were low concentration schools, and 133 (10%) were high concentration schools. If Els were distributed evenly across schools, the percentage of Els enrolled in each school type would be equivalent to the proportion of the school type across the state. Table 14 shows the percentage of the total El population that is enrolled in each type of school. The first cell reads 23% of all RELs in North Carolina are enrolled in low concentration schools. Results clearly show that Els are not evenly distributed across schools. Twenty-six percent of CELs and 18% of RELs are enrolled in just 10% of schools. High concentration schools also enroll many more poor students and minority students and average ELA achievement is substantially lower than in either low or medium concentration schools (-.39 SD in high concentration vs. -.06 in medium concentration vs. -.04 SD in low concentration). Els are also overrepresented in medium concentration schools by about 10% and underrepresented in low concentration schools.

Table 13 ***Percent of El Population Enrolled in Schools, by El Concentration***

	Low	Medium	High
REL	22.92	58.35	18.73
CEL	19.09	54.39	26.53
Total El	20.97	56.33	22.71

Variation in segregation across school level. The transition from elementary school to middle school is usually accompanied by sweeping change in the size and structure of school. Middle schools are larger than elementary schools and typically draw from a larger catchment area. Across North Carolina, the average middle school enrolls about 740 students whereas the average elementary school only enrolls around 280 students. Students in elementary schools are most often taught in a self-contained setting, in which they are with one teacher and one group of peers for most of the day. In contrast, middle schools tend to have a departmentalized structure, where students move from one class and teacher to another for instruction in different subjects. A departmentalized school structure allows for more instructional offerings and in many cases students are tracked into remedial, grade-level, or advanced courses in ELA and math depending on their prior achievement. For these reasons it is likely that the classroom environment for Els shifts when they enter middle school. Table 15 shows differences in segregation measures for students in middle and elementary school.

Table 14 ***Summary of Segregation Measures by School Level and El Status, ELA, 2012-13***

	Current El		Reclassified El	
	ES	MS	ES	MS
Exposure	0.74	0.68	0.78	0.81
	(0.21)	(0.28)	(0.18)	(0.16)
Segregated	0.02	0.08	0.00	0.00
	(0.13)	(0.28)	(0.05)	(0.05)
Singleton	0.09	0.07	0.11	0.09
	(0.29)	(0.25)	(0.31)	(0.29)
Within-school unevenness	0.09	0.17	0.09	0.06
	(0.05)	(0.11)	(0.02)	(0.01)
Between-school unevenness	0.07	0.04	0.03	0.02
	(0.04)	(0.03)	(0.02)	(0.02)
Total Segregation	0.16	0.21	0.12	0.09
	(0.07)	(0.12)	(0.03)	(0.03)
Class CEL %	0.24	0.26	0.10	0.06
	(0.18)	(0.27)	(0.11)	(0.09)
Class REL %	0.06	0.09	0.17	0.17
	(0.09)	(0.09)	(0.11)	(0.11)
N (Students)	218758	232830	218758	232830

Math Results available in Table B4 in Appendix B.

When CELs enter middle school their exposure to NESs decreases and the number of CELs in segregated classes increases markedly. While still less than 10% of the CEL population is in a segregated classroom, the increase from elementary school to middle school is four fold. The increase in both measures for CELs is likely due to the structural changes explained above. Students still struggling to learn English, or perhaps who have recently arrived in the country (a small portion of the overall El population[11]), will be tracked into remedial or specialized ESL classes where they will be less exposed to NESs. Figure 6 shows that there is indeed a substantial increase in the proportion of CELs enrolled in ESL classes when students make the transition to middle school after 5th grade.

Measures of unevenness also increase substantially for CELs when they move to middle school. Total unevenness increases by 31%, from 16% to 21%. This increase is all attributable to an increase in within-school unevenness. In fact, between-school unevenness decreases when CELs transition to middle school. The decrease in between-school unevenness can likely be explained by the fact that there are fewer middle schools than elementary schools per district, limiting potential variation across schools.

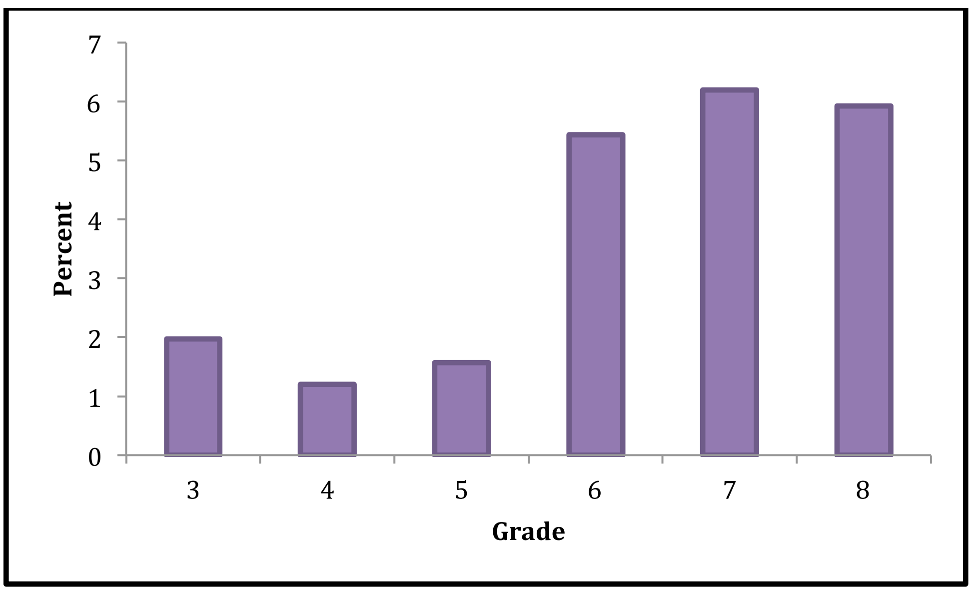

Figure 6. **Bar graph showing the proportion of CELs enrolled in ESL courses, by grade, in ELA, 2012-13.**

While overall exposure to NESs increases for RELs when they move to middle school, the proportion of these students in singleton classes decreases. One possible explanation for this

[11] It is not possible to calculate how many students have recently arrived in the country with these data. However, we know that in 2011-12, 69% of 8th grade Els first enrolled in NC public schools before 1st grade.

trend is related to the fact that the ratio of students who have reclassified to those who have not increases over time (Figure 7). As reclassified English learners integrate more completely with the NES population, their representation in all classes increases reducing the possibility for singleton classes.

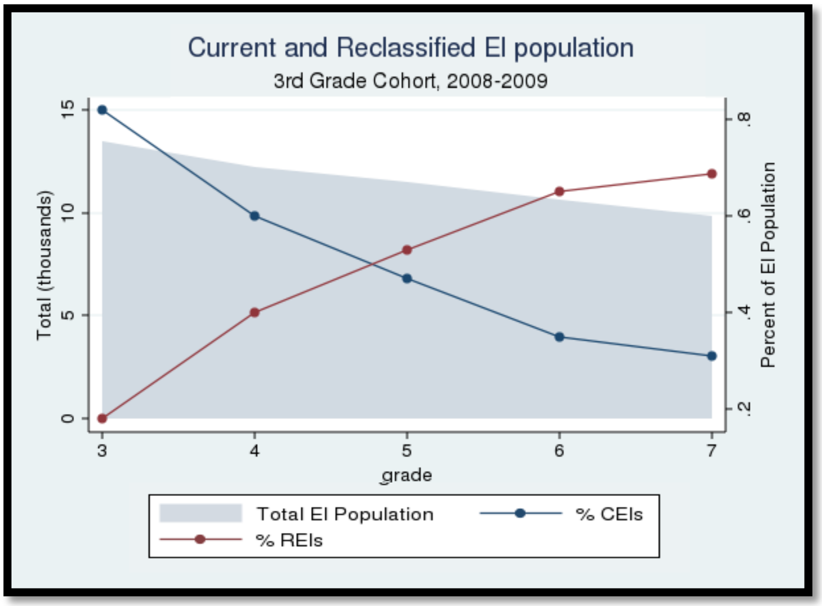

***Figure 7*. Changing proportion of CELs and RELs.**

Unlike their CEL peers, the distribution of RELs becomes more even when they transition to middle school. All three unevenness measures decrease for RELs, and their distribution across both schools and classrooms is less than 10% different than if they were perfectly integrated.

Variation in segregation across schools with different immigrant growth profiles. The growth in the immigrant and El population over the last decade has not been evenly distributed across the state. Some schools, even within the same district, have seen much greater growth than others. To highlight how segregation may be different in schools that have had different histories of immigrant growth, each school was categorized as a New Destination school, an

Established and Growing school, an Established and Stable school, or a Low Incidence schools. Table 16 summarizes the characteristics of each.

Table 15 ***Summary of Immigrant Growth Profiles***

	School %El, 2001		Growth in School El%, 2001-2013	
	<50th Percentile	>50th Percentile	<50th Percentile	>50th Percentile
New Destination	X			X
Established and Growing		X		X
Established and Stable		X	X	
Low Incidence	X		X	

Table 17 gives a basic description of schools categorized by each immigrant growth profile. Established and Growing schools enroll the greatest proportion of Els, more than double the proportion in Established and Stable schools and about 6% more than in New Destination schools. New Destination schools are concentrated in urban areas. A majority of Established and Growing and Established and Stable schools are in rural areas, and a plurality of Low Incidence schools can also be found in rural areas. Considering that nearly half of all schools in North Carolina are found in rural areas, it is not unusual that the three school types just referenced, i.e. Established and Growing, Established and Stable, and Low Incidence, all are predominantly found in rural areas. The majority of schools in North Carolina are either Low Incidence or New Destination. This points to the unequal growth in Els across the state: while some schools hardly have any Els, nearly the same number of schools have seen rapid growth.

Differences in segregation indices across schools with different immigrant growth profiles are shown in Table 18. For both current and reclassified Els, exposure to NESs is lowest in schools that are Established and Growing, and, not surprisingly, greatest in schools with a Low Incidence of Els. For CELs, enrollment in segregated classrooms follows the same pattern with the greatest proportion of students in segregated classes found in Established and Growing schools.

Table 16 ***Summary of School Characteristics by Immigrant Growth Profile, ELA, 2012-13***

	New Destination	Established Growing	Established Stable	Other Destination
School % El	16.53	23.30	10.81	8.79
	(10.30)	(10.53)	(7.52)	(8.42)
Urban	0.55	0.22	0.25	0.34
	(0.50)	(0.42)	(0.43)	(0.48)
Rural	0.27	0.52	0.55	0.47
	(0.45)	(0.50)	(0.50)	(0.50)
Suburban	0.17	0.26	0.20	0.19
	(0.38)	(0.44)	(0.40)	(0.39)
School Size	462.64	492.23	552.77	571.03
	(310.39)	(269.85)	(313.90)	(357.17)
# of Schools	413	280	182	403
% of Schools	32.32	21.91	14.24	31.53
Observations	18,956	20,924	7,955	13,510

The three unevenness measures are not appropriate for comparing schools with different immigrant growth profiles because schools from different districts are represented in each group. However, comparing the average proportion of Els in classrooms and schools gives a sense of unevenness. On average, both CELs and RELs are more concentrated in classrooms than in their school. For example, a CEL in an Established and Growing school is likely to be in a class where about a third of the students are learning English, even though the in the school less than 20% of the students are learning English. The smallest dissimilarities between class and school proportion of Els exists in Low Incidence schools and the largest differences are in New Destination and Established and Growing Schools.

Table 17 ***Summary of Segregation Measures by Immigrant Growth Profile and El Status, ELA, 2012-13***

	Current El				Reclassified El			
	ND	EG	ES	LI	ND	EG	ES	LI
Std. Score	-0.95	-0.95	-0.94	-0.85	0.09	0.00	0.06	0.15
	(0.83)	(0.81)	(0.80)	(0.84)	(0.80)	(0.78)	(0.80)	(0.82)
Exposure	0.72	0.65	0.80	0.80	0.78	0.73	0.84	0.86
	(0.23)	(0.24)	(0.20)	(0.24)	(0.16)	(0.17)	(0.14)	(0.15)
Segregated	0.04	0.06	0.02	0.04	0.00	0.00	0.00	0.00
	(0.19)	(0.23)	(0.15)	(0.19)	(0.06)	(0.05)	(0.04)	(0.04)
Singleton	0.07	0.02	0.12	0.19	0.07	0.03	0.12	0.21
	(0.25)	(0.16)	(0.33)	(0.40)	(0.25)	(0.17)	(0.33)	(0.40)
School CEL %	0.14	0.17	0.07	0.10	0.11	0.14	0.06	0.05
	(0.10)	(0.09)	(0.06)	(0.15)	(0.08)	(0.08)	(0.05)	(0.06)
Class CEL %	0.25	0.30	0.17	0.19	0.08	0.10	0.05	0.04
	(0.22)	(0.23)	(0.17)	(0.21)	(0.10)	(0.11)	(0.08)	(0.08)
School REL %	0.09	0.11	0.08	0.07	0.10	0.13	0.09	0.08
	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.06)	(0.07)	(0.06)
Class REL %	0.07	0.08	0.07	0.06	0.17	0.20	0.14	0.13
	(0.09)	(0.10)	(0.09)	(0.08)	(0.11)	(0.12)	(0.10)	(0.10)
N	133046	104554	71692	142296	133046	104554	71692	142296

Note: ND=New Destination, EG= Established and Growing, ES= Established and Stable, LI= Low Incidence
Math Results available in Table B5 in Appendix B.

Variation in segregation across time. This study was motivated in part by the rapid growth in the immigrant and El population in North Carolina in the past two decades. There has been a dramatic change in the proportion of Els across the state. Due to the changing demographics across North Carolina over the last decade, there is a reasonable chance that schools and classrooms segregation has also changed. Table B6 in Appendix B shows how exposure and the segregation indices have changed for CELs and RELs since 2006-2007.

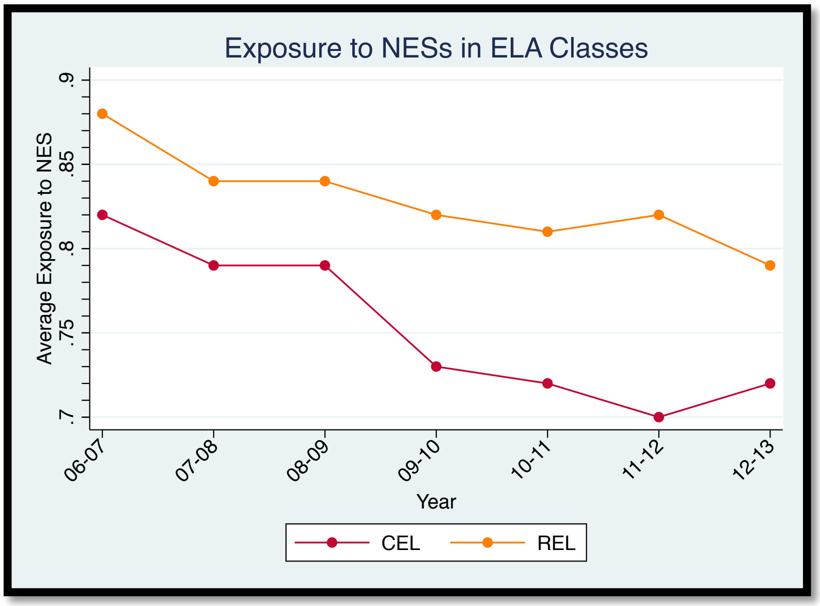

Figure 8. **Change in exposure over time, by El status.**

There has been a decrease in exposure over time of about 10% for both CELs and RELs, as depicted in Figure 8. Notably, CELs are consistently more segregated from NESs across time than RELs. During the same period, the number of ELs in segregated classrooms has stayed stable while the number of Els in singleton classrooms has dropped substantially. The proportion of CELs in singleton classrooms dropped 13%, from 21% to 8%, and the proportion of RELs in singleton classrooms dropped 18%, from 28% to 10%.

The unevenness measures present different stories for RELs and CELs. What is most evident, as shown in Figure 9 below, is that total segregation is always greater for CELs than for RELs. While between-school unevenness increases slightly over time for CELs, within-school unevenness increases for RELs. For both groups of Els, total segregation increases slightly over the period of study.

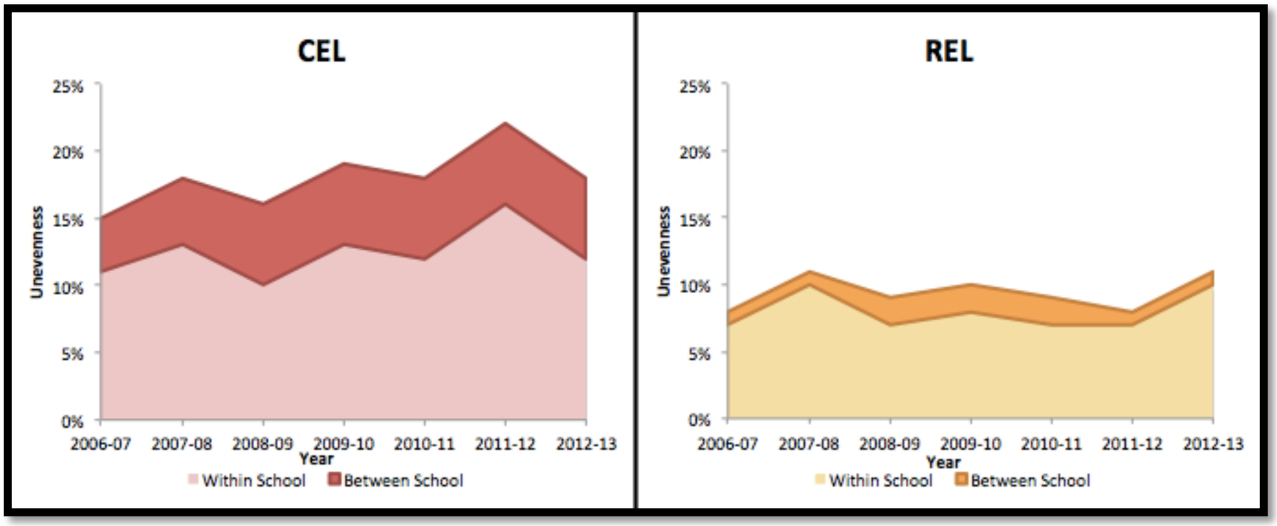

***Figure 9*. Evenness within and across schools over time, by El status.**

Access to ESL Credentialed or El Experienced Teachers

The next section of the descriptive analysis focuses on the second research question: Do Els have access to teachers who have an ESL certification or who have had experience in the previous year teaching Els? How does access to these teachers vary over time, by urbanicity, by school level, by school concentration of El, and by immigrant growth profiles?

In addition to the two indicators of teacher quality mentioned above, results are also reported for the average total years of experience as well as whether a teacher is new (i.e., in their first three years of teaching) to provide a more robust description of the ESL teacher labor force.

As in the previous section, I begin with describing results obtained for the 2012-13 school year in ELA. One exception is for average teacher test scores: these data are not available for the 2012-13 year and so I report the results from 2011-12 instead. I report results for math only when they are substantially different than from ELA; however, all math results are included in Appendix B. I conclude this section by describing changes in teacher characteristics over time.

Differences in access for CELs, RELs, and NESs. To answer the research question I focus on access: how many Els have teachers with a particular characteristic. However, to ground the results in the North Carolina context, Table 21 shows the proportion of teachers across North Carolina who have each particular characteristic.

Table 18 ***Summary of Characteristics of Teachers By El Status, ELA, 2012-13***

	Current El	Reclassified El	NES
ESL Credential	0.13	0.02	0.01
	(0.34)	(0.13)	(0.12)
Prev Year El Exp	0.61	0.66	0.55
	(0.49)	(0.48)	(0.50)
Years Experience	10.18	9.82	10.57
	(8.26)	(8.23)	(8.60)
New Teacher	0.26	0.27	0.23
	(0.44)	(0.44)	(0.42)
Average Test Score (std)	.18	0.17	0.14
	(0.68)	(0.65)	(0.65)
N (Teachers)	854	954	8,320

It is immediately clear that while there are few credentialed El teachers overall, teachers of CELs are the most likely to have an ESL credential. In 2012-13, 13% of teachers who taught CELs had an ESL credential, compared to only 2% of those who taught RELs and 1% who taught NESs. If we assume that having a credential increases the capacity of a teacher to support the learning needs of a student currently learning English, it seems that positive matching is occurring to exploit this advantage. Turning to Table 22, which shows the proportion of Els who have a teacher with a particular characteristic, we see that while 10% of the teachers of CELs have an ESL credential, only 6% of CELs have access to such a teacher.

Table 19 ***Summary of Students with Teachers having Characteristics by El Status, ELA, 2012-13***

	Current El	Reclassified El	NES
ESL Credential	0.06	0.02	0.01
	(0.23)	(0.13)	(0.12)
Prev Year El Exp	0.54	0.53	0.41
	(0.50)	(0.50)	(0.49)
Years Exp	12.93	13.86	13.99
	(8.24)	(8.17)	(8.11)
New Teacher	0.22	0.22	0.20
	(0.11)	(0.10)	(0.10)
Avg Test Score	0.17	0.17	0.16
	(0.71)	(0.71)	(0.71)
N (Students)	38150	36668	376770

Math Results available in Table B8 in Appendix B.

More than half of teachers had such El experience in 2012-13. The discrepancy between the proportion of teachers with an ESL credential and the proportion of teachers with El experience makes clear that by and large Els are taught by teachers whose area of expertise is not teaching English as a second language.

There are only marginal differences in the average total experience of teachers who have CEL or NES students: teachers of all three groups average just over 10 years of experience. RELs are most likely to be taught by teachers with fewer than 10 years of experience. NESs and RELs are slightly more likely to have a teacher who is in her first three years of teaching than CELs. Finally, teachers of the three groups of students have comparable average test scores. On average, teachers of CELs score higher than those of either RELs or NESs.

Variation in access across urbanicity. Figure 10 shows the proportion of teachers working in rural, urban, and suburban areas. Because most North Carolina schools are in rural areas, the plurality of teachers, about 44%, work in rural areas. About 34% of teachers are in urban areas and around 21% are in suburban areas.

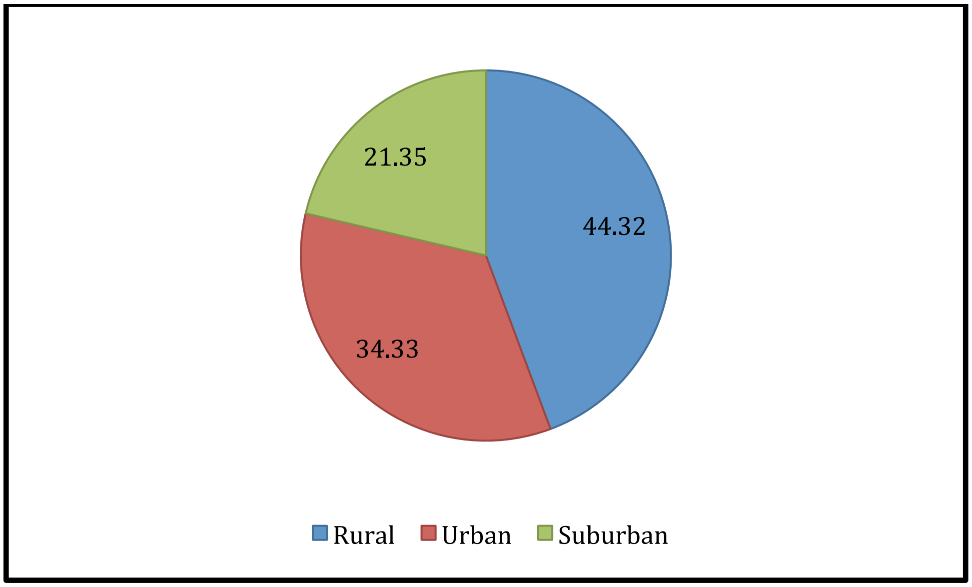

Figure 10. **Pie chart showing distribution of teachers, by urbanicity.**

The average characteristics of teachers in each urbanicity for CELs and RELs are listed in Table 21. Results show that CELs in urban areas are more likely than those in other areas to have access to an ESL credentialed teacher. Teachers in urban areas might have better access to test taking sites and so may be more likely to receive a credential. CELs living in urban areas also have the greatest access to El experienced teachers compared to their peers in rural and suburban areas. This is due both to the distribution of El experienced teachers and the distribution of Els across urbanicities. The greatest absolute number and the greatest proportion (about 42%) of El experienced teachers work in urban areas. The El population is about the same in rural and urban areas (≈ 40%) while only about 20% of Els live in suburban areas. Thus, in rural areas, approximately the same proportion of Els are taught by a smaller proportion of El experienced teachers, meaning that access to these teachers is lower for rural CELs. Interestingly, while the proportion of Els in suburban areas is about half of the proportion found in rural and urban areas, Els in suburban areas are taught by nearly the same proportion of El experienced teachers. This could indicate that in suburban schools, Els are more concentrated in classrooms that are led by an El experienced teacher than their peers in urban or rural areas.

A much greater proportion of Els than NES are taught by an El experienced teacher. Across all urbanicities, at least 10% more RELs and CELs have an El experienced teacher compared to NES. This might be an indication that while there are very few ESL credentialed teachers, there is a cadre of teachers who are designated to teach Els on account of their experience.

Table 20 ***Summary of Teacher Characteristics by Urbanicity and El Status, ELA, 2012-13***

	Current El			Reclassified EL			NES		
	Urban	Rural	Suburban	Urban	Rural	Suburban	Urban	Rural	Suburban
ESL Credential	0.05	0.03	0.04	0.02	0.02	0.01	0.02	0.01	0.01
	(0.23)	(0.18)	(0.19)	(0.13)	(0.12)	(0.12)	(0.14)	(0.11)	(0.10)
Prev Year El Exp	0.59	0.51	0.49	0.57	0.49	0.5	0.48	0.36	0.38
	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.48)	(0.49)
Years Exp	9.32	10.58	10.19	9.68	10.79	11.04	10.11	11.26	11.21
	(8.11)	(8.41)	(8.13)	(8.13)	(8.52)	(8.59)	(8.24)	(8.62)	(8.32)
New Teacher	0.23	0.2	0.2	0.23	0.2	0.19	0.21	0.19	0.18
	(0.11)	(0.10)	(0.09)	(0.11)	(0.10)	(0.09)	(0.11)	(0.10)	(0.09)
Avg Test Score	0.17	0.12	0.31	0.18	0.12	0.33	0.17	0.12	0.28
	(0.74)	(0.68)	(0.64)	(0.75)	(0.70)	(0.63)	(0.74)	(0.69)	(0.63)
N (Students)	163620	196675	35015	163620	196675	35015	163620	196675	35015

Math Results available in Table B9 in Appendix B.

Both CELs and RELs in urban areas have access to teachers with fewer years of total experience compared to their peers in other areas. This is a reflection of overall trends: teachers working in urban areas, regardless of whether they are teaching Els or NESs, have fewer years of experience compared to those in other urbanicities. Similarly, there are more new teachers in urban areas (Figure 11), and so all students are more likely to have a new teacher in these areas. RELs and CELs are nearly equally likely to have a new teacher and both groups are more likely than NESs to have a new teacher. The largest difference in access to more experienced teachers is between urban and rural areas.

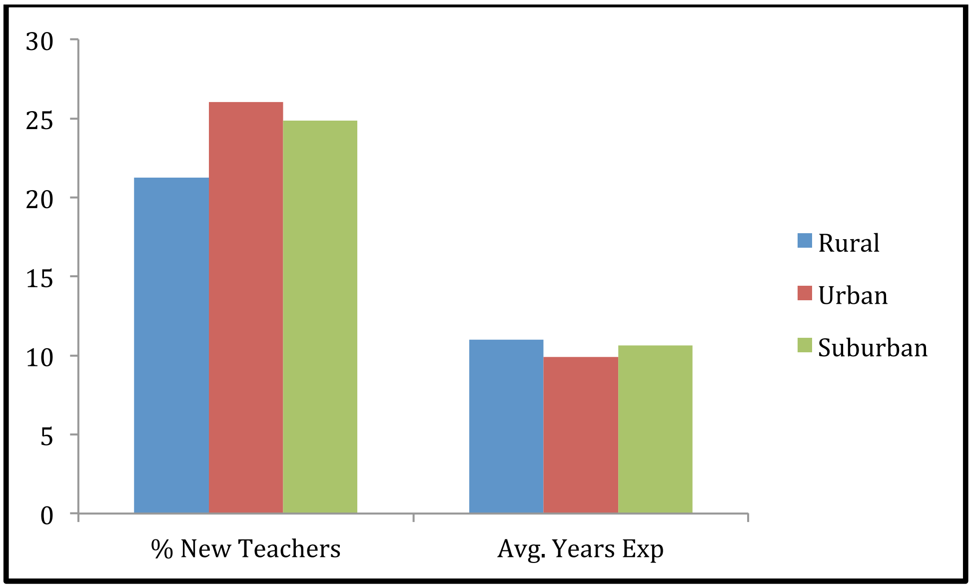

Figure 11. **Proportion of new teachers and average experience by urbanicity.**

Finally, the average teacher test score is the most variable indicator across the three urbanicities. For all subgroups, the average tests scores for teachers in suburban areas is more than twice as high as the test scores of teachers in rural areas and almost 15% higher than test scores of teachers in urban areas. Thus if test scores are related to teacher efficacy, as suggested in previous literature (Clotfelter, et al, 2007; Hightower, et al, 2011), students in rural areas are at a disadvantage.

Variation in access across schools with different concentrations of Els. The proportion of teachers with an ESL credential or with experience teaching Els is positively correlated with the concentration of Els in a school. Four times as many CELs in high concentration schools than in low concentration schools are taught by an ESL credentialed teacher (Table 22). This is hardly surprising, but again points to matching of teachers with ESL credentials to ESL students. Results show that matching only happens for CELs; the same proportion of RELs are taught by ESL Credentialed teachers as native English speakers across all school types.

Schools with a higher concentration of Els are invariably going to have more teachers with experience teaching Els, as evidenced in Table 24. What is striking about the relationship between El experience and school concentration is that while there is a positive correlation between school El population and the number of teachers with experience, CELs, RELs and NES are nearly equally likely to be taught by an experienced teacher within all types of schools. That is, there is a greater concentration of teachers with El experience in high concentration schools, but students currently learning English in high concentration schools do not have greater access to these teachers than other types of students. In fact, even in medium and low concentration schools, CELs are only slightly more likely to have an ESL experienced teacher than other types of students.

Research conducted in North Carolina shows that teachers in schools with a high concentration of racial and ethnic minorities are more likely to be new teachers and are less likely to be credentialed (Ladd, 2008). The results in Table 22 show that in this is also the case when schools have a higher proportion of linguistic minorities. Teachers in schools with low concentrations of Els have about 2 more years of experience than teachers in high concentration schools. Additionally, about 6% more teachers are within their first three years of teaching in high concentration schools compared to low concentration schools.

Table 22 ***Summary of Teacher Characteristics by School El Concentration and El Status, ELA 2012-13***

	Current El			Reclassified El			NES		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
ESL Credential	0.08	0.06	0.02	0.03	0.02	0.01	0.03	0.02	0.01
	(0.27)	(0.24)	(0.13)	(0.17)	(0.13)	(0.09)	(0.16)	(0.13)	(0.10)
Prev Year El Exp	0.65	0.58	0.27	0.66	0.58	0.28	0.66	0.55	0.23
	(0.48)	(0.49)	(0.44)	(0.47)	(0.49)	(0.45)	(0.47)	(0.50)	(0.42)
Years Exp	8.72	10.18	11.03	8.68	10.38	11.38	8.77	10.49	11.36
	(8.14)	(8.35)	(8.54)	(8.04)	(8.47)	(8.66)	(8.22)	(8.47)	(8.63)
New Teacher	0.25	0.22	0.18	0.25	0.22	0.18	0.25	0.21	0.18
	(0.11)	(0.10)	(0.10)	(0.11)	(0.10)	(0.10)	(0.11)	(0.10)	(0.10)
Avg Test Score	0.15	0.18	0.14	0.14	0.17	0.18	0.12	0.17	0.15
	(0.70)	(0.73)	(0.70)	(0.71)	(0.73)	(0.69)	(0.72)	(0.72)	(0.70)
N	41649	226806	183133	41649	226806	183133	41649	226806	183133

Math Results available in Table B10 in Appendix B.

Average test scores for teachers in schools with different El populations do not offer a consistent story. On average, teachers with lower test scores teach in high concentration schools. However, within high concentration schools, CELs are assigned to teachers who have marginally better test scores than teachers of RELs and NESs. CELs are also assigned to the highest achieving teachers in medium concentration schools. In low concentration schools, RELs are assigned the teachers with the highest average test scores. In sum, while higher concentration schools employ teachers with lower test scores, within these schools teachers with the highest test scores teach Els.

Assuming that higher test scores are related to better quality teachers, one story that could explain this pattern is that in high concentration schools the best teachers are assigned to the lowest achieving students (in this case CELs). One can imagine that in schools with large El populations, there is more concern with the performance of the CEL subgroup. In medium concentration schools, where CELs typically make up less than 8% of the school population, the school might be less focused on Els as a specific subgroup, and so there are fewer differences in the “quality” of teacher assigned to CELs, RELs, or NES. In low concentration schools, CELs may not be the highest priority because of their very small population, and “better” teachers might be systemically assigned to the highest achieving students, in this case RELs.

Variation in access across school level. There is a three-fold increase in the proportion of CELs who are taught by a credentialed teacher when these students transition to middle school, but no discernable change for RELs (Table 23). School structure and credentialing practices may explain these differences. In middle school, teachers are more likely to have a specialized credential of some sort (in math, science, reading, or a special subject) because middle school classes are typically departmentalized. In elementary school, where teachers are usually teaching all subjects in a self-contained setting, they are more likely to have a general education credential. As was demonstrated in the previous section, students who are still struggling to learn English in middle school are more likely to receive specialized language support, rather than content area (i.e. ELA, math) support and so there may be more demand for an ESL credentialed teacher. RELs, on the other hand, do not typically receive specialized English instruction.

At the same time, Els experience a decrease in access to El experienced teachers when they move to middle schools. About 7% fewer CELs are taught by El experienced teachers in middle school compared to elementary school. This might be partially explained by a larger proportion of Els being in classes with new teachers in middle school. While students are more likely to be taught by teachers with more total years of experience when they reach middle school, they are also more likely to be taught by a new teacher. New teachers as a group may have less experience with Els over all because the group includes teachers who have no experience teaching anyone in the prior year.

When students move to middle school, they are taught by teachers with lower average test scores than they had access to in elementary school. The drop in average teacher test score occurs across teachers of all students but is greatest for the teachers of RELs.

Table 21 ***Summary of Teacher Characteristics by School Level and El Status, ELA, 2012-13***

	Current El		Reclassified El		NES	
	Elementary	Middle	Elementary	Middle	Elementary	Middle
ESL Credential	0.03	0.09	0.02	0.02	0.02	0.01
_	(0.18)	(0.29)	(0.14)	(0.13)	(0.13)	(0.11)
Prev Year El Exp	0.55	0.48	0.53	0.52	0.41	0.42
_	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	(0.49)
Years Exp	9.79	10.23	9.90	10.55	10.55	10.96
_	(8.25)	(8.55)	(8.40)	(8.52)	(8.41)	(8.67)
New Teacher	0.20	0.24	0.20	0.23	0.18	0.22
_	(0.10)	(0.11)	(0.10)	(0.10)	(0.10)	(0.10)
Avg Test Score	0.18	0.15	0.20	0.14	0.18	0.14
_	(0.68)	(0.77)	(0.67)	(0.75)	(0.66)	(0.75)
N	218758	232830	218758	232830	218758	232830

Math Results available in Table B11 in Appendix B.

Variation in access across schools with different immigrant growth profiles. Table 24 shows differences in Els' access to teachers with various characteristics across schools categorized by the growth in their El population. Thirteen percent of CELs in schools with Established and Growing populations are in classes with an ESL credentialed teacher, as opposed to about 8% in schools that are New Destinations and 6% in Established and Stable schools. One would expect that schools that have had a large population of Els, and who have had a large El population for some time, would have had a chance to acquire the human capital, e.g. credentialed teachers, to teach this population. New Destination schools might have fewer resources than Established and Growing schools if there is a lag between changes in the school El population and response to that change.

Table 22 ***Summary of Teacher Characteristics by Immigrant Profile and El Status, ELA, 2012-13***

	CEL				REL				NES			
	ND	EG	ES	LI	ND	EG	ES	LI	ND	EG	ES	LI
ESL Credential	0.08	0.13	0.06	0.07	0.02	0.03	0.00	0.02	0.01	0.02	0.01	0.02
–	(0.27)	(0.34)	(0.24)	(0.26)	(0.14)	(0.17)	(0.00)	(0.12)	(0.12)	(0.14)	(0.10)	(0.13)
Prev Year El Exp	0.55	0.58	0.55	0.43	0.53	0.61	0.36	0.36	0.42	0.60	0.40	0.29
–	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.49)	(0.49)	(0.48)	(0.49)	(0.49)	(0.49)	(0.45)
Years Exp	9.96	9.93	10.50	10.57	9.80	9.73	10.32	10.16	10.19	10.26	11.39	10.84
–	(8.74)	(7.98)	(7.54)	(8.56)	(8.96)	(8.30)	(8.06)	(8.43)	(8.63)	(8.47)	(8.39)	(8.45)
New Teacher	0.23	0.22	0.15	0.21	0.22	0.22	0.17	0.21	0.20	0.20	0.17	0.19
–	(0.12)	(0.10)	(0.09)	(0.11)	(0.11)	(0.10)	(0.09)	(0.11)	(0.11)	(0.10)	(0.10)	(0.10)
Avg Test Score	0.17	0.21	0.18	0.14	0.19	0.31	0.19	0.16	0.16	0.16	0.19	0.17
–	(0.74)	(0.71)	(0.67)	(0.73)	(0.70)	(0.68)	(0.62)	(0.65)	(0.70)	(0.69)	(0.65)	(0.69)
N	133046	104554	71692	142296	133046	104554	71692	142296	133046	104554	71692	142296

Math Results available in Table B12 in Appendix B.

Oddly, about the same proportion of CELs in low incidence schools and new destination schools are taught by a credentialed teacher. This could happen if CELs are more concentrated in particular classrooms or if there are more ESL credentialed teachers in low incidence schools. However, Figure 12 shows that there is in fact not a greater proportion of ESL credentialed teachers in low incidence school: in both New Destination schools and Low Incidence schools only about 2% of teachers have an ESL credential.

Across all groups of students, teachers in Established and Stable schools have about 1 more year of experience than teachers in schools with other immigrant growth profiles. Access to teachers with more total experience follows the same pattern in each type of school: NESs are taught by teachers with the most experience, and CELs are taught by teachers with marginally higher average experience than RELs.

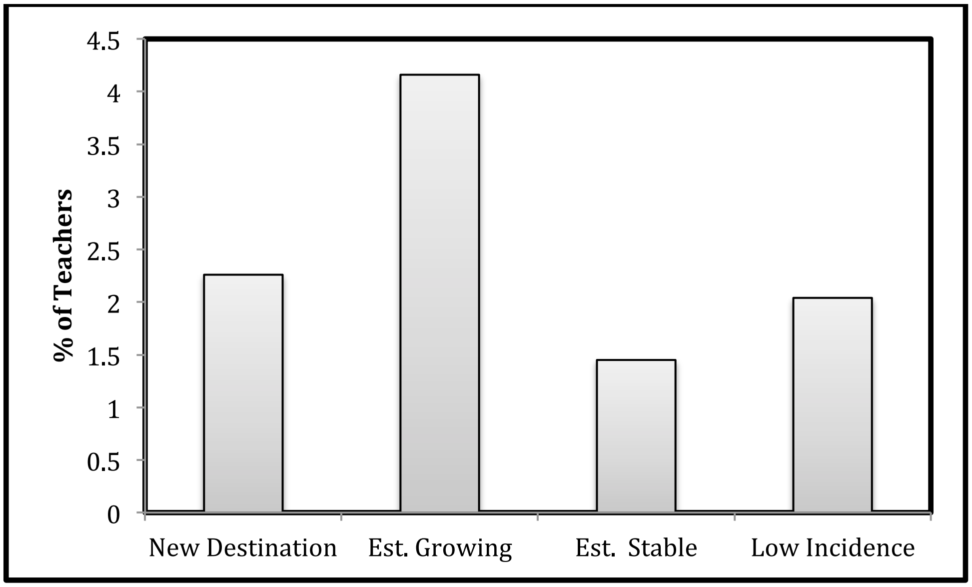

Figure 12. **Percent of teachers with ESL certification in schools with different immigrant growth profiles.**

Variation in teacher test scores lends credence to the hypothesis posited in the previous section: where there are fewer Els, CELs are assigned to lower performing teachers than NESs or RELs. In schools that have a larger or faster growing El population, Els overall have access to higher performing teachers than NES. The largest variation in test scores for teachers of CELs, RELs, and NES exists in Established and Growing schools, where RELs have access to teachers whose average test score is at least .1 standard deviations higher than those of teachers of CELs or NES.

In 2012-13, schools with different profiles were different in other important ways, as described in the previous section (Table 17). These differences also help explain the variation in total experience and test scores that exist across immigrant growth profiles. Schools in Established and Growing areas have teachers with slightly higher years of experience and fewer new teachers than schools in other areas. The majority of these schools are located in rural areas and do not have a very high concentration of Els. This is consistent with earlier results showing that teachers in rural areas or in schools with medium or low concentration of schools had the highest experience. In contrast, New Destination schools, which are concentrated in urban areas, employ teachers with the least experience. It is likely that differences in general teacher characteristics, such as years of experience and average test score, are driven more by where schools with different immigrant growth profiles tend to be located and their average minority population rather than by the growth in the immigrant population per se.

Variation in access across time. Figure 13 shows how the proportion of ESL credentialed teachers has changed for CELs and RELs over time. Also shown in Figure 13 is the change in the proportion of all teachers in North Carolina who have an ESL credential. The proportion of all teachers in NC who have an ESL credential (as indicated by the green dotted line) has remained around 2% for the last 7 years. Similarly, the proportion of teachers who teach any REL has remained static. There have been changes in the proportion of teachers who teach any CEL, with an overall increase from 2006-07 to 2012-13. As such, the proportion of CELs who have access to ESL credentialed teachers has also grown. Again, assuming that teachers with an ESL credential are more effective in improving El achievement, the growth indicated in Figure 13 can be interpreted as a positive trend, with the caveat that more than 90% of all CELs in North Carolina do not have access to a credentialed teacher.

Teachers in North Carolina are only required to have an ESL credential if they are teaching a “pull out” class (L. Fults, personal communication, October 13, 2014). As mentioned previously, pull out classes are not prevalent in North Carolina. Fewer than 10% of students are ever enrolled in a class that is specifically designed for Els, thus many teachers have little incentive to obtain an ESL credential.

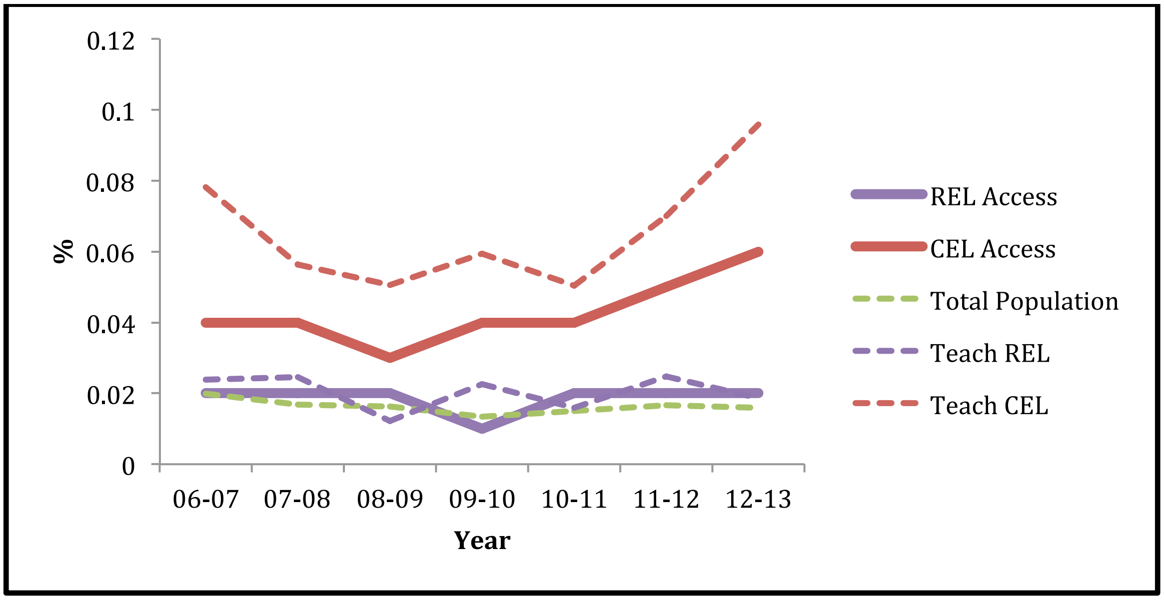

Figure 13. **Change in proportion of teachers with ESL credential and proportion of students taught by teachers with an ESL credential over time, ELA.**

Surprisingly, there is a slight downward trend in the proportion of CELs taught by teachers with El experience over time (Table B13 in Appendix B). IN 2006-2007, 64% of CELs and 63% of RELs were taught by an El experienced teacher. By 2012-13, only 54% of CELS and 49% of RELs were taught by El experienced teachers. The expected trend would be opposite: as the number of Els grows, more teachers would interact with these students and so the proportion would increase. Because we know the number of Els has increased over time, the downward trend in the proportion of teachers with El experience must be explained by a decreasing or static number of teachers teaching Els. It could be that within schools, as the number of Els grows, the same teacher simply takes on more El students, while the rest of the teachers continue teaching predominantly NESs.

The Effect of Segregation and Teacher Training on El Achievement

This section is organized into three subsections. The first section summarizes descriptive characteristics of the sample that were not addressed above and the subsequent sections provide evidence to support or contradict each of the 2 hypotheses. Considering the important differences between CELs and RELs and between students in middle and elementary school, the full sample of Els is disaggregated into a CEL sample and a REL sample for description and analysis. Figure 14 lists each sample and the sample size. Note that the CEL ELA sample has about 10,000 fewer observations. This is likely due to the fact that CELs in their first year of schooling can opt out of taking the ELA standardized tests and students without valid test scores are excluded from this study.

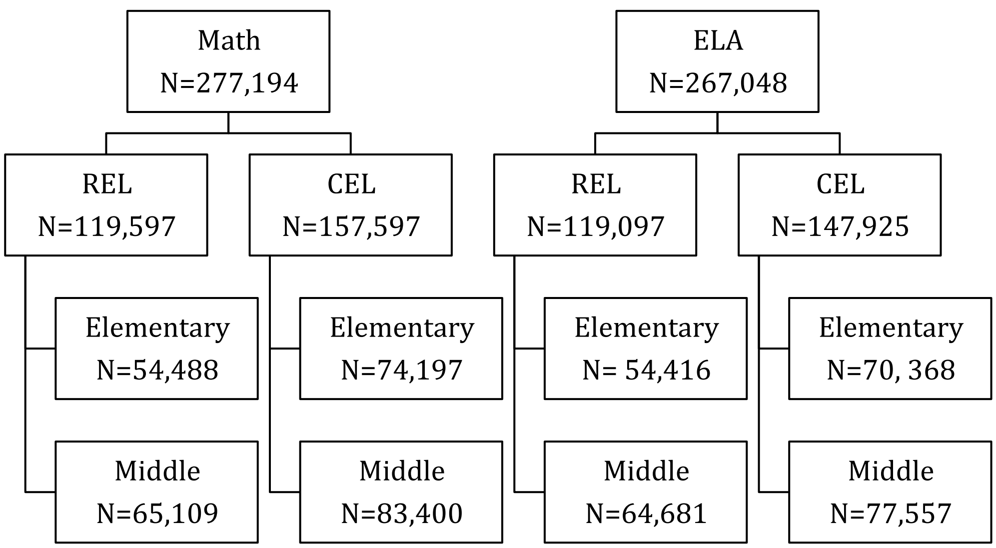

***Figure 14*. Samples and sample sizes.**

Descriptive statistics.

Dependent variables. Depending on the model, the dependent variable is either a standardized math or ELA score. These variables were standardized by year and grade and represent the average deviation from the mean performance for all students in a particular grade and year. It is clear from these data that Els as an overall group underperform compared to the state average for their grade and year. While the average standardized math and ELA scores change from year to year, scores for Els are always below the mean.

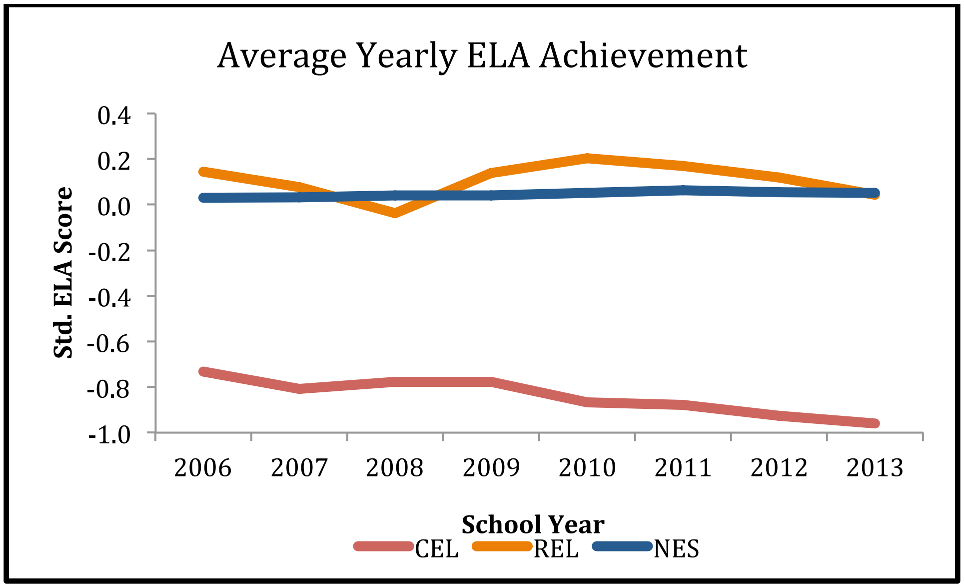

***Figure 15*. Average Std. ELA achievement over time, by El status.**

The low average achievement in both math and ELA is driven exclusively by the poor performance of CELs, as depicted in Figure 15. RELs, on the contrary, typically score above the mean for their grade and year. In most years, the achievement gap between CELs and RELs is actually larger than the gap that exists between CELs and NESs. Across all years, current Els score between 3/4 and 1 standard deviation lower than the mean in ELA and about half a standard deviation lower in math. RELs score about .15 standard deviations above the mean in ELA and 0.27 standard deviations above the mean in math. While there are obvious differences in the achievement of these two groups, they are similar in that both groups perform worse in ELA than they do in math. In any case, the achievement gap between reclassified and current Els makes it imperative to treat these as distinct groups when conducting analyses.

Table 23 ***Summary of Dependent Variables used in Analyses, by El Status and Variables of Interest, 2012-13***

	REL ELA	REL Math	CEL ELA	CEL Math
Pooled	0.15	0.27	-0.73	-0.49
	(0.76)	(0.86)	(0.85)	(0.87)
Elementary	0.31	0.42	-0.51	-0.32
	(0.69)	(0.81)	(0.76)	(0.83)
Middle	0.01	0.15	-0.92	-0.64
	(0.79)	(0.88)	(0.88)	(0.88)
Rural	0.07	0.18	-0.72	-0.50
	(0.73)	(0.82)	(0.82)	(0.82)
Urban	0.22	0.37	-0.73	-0.49
	(0.79)	(0.90)	(0.88)	(0.91)
Suburban	0.15	0.28	-0.72	-0.48
	(0.75)	(0.84)	(0.86)	(0.89)
New Destination	0.18	0.30	-0.72	-0.49
	(0.76)	(0.86)	(0.86)	(0.88)
Established & Growing	0.08	0.19	-0.77	-0.53
	(0.75)	(0.84)	(0.84)	(0.86)
Established & Stable	0.12	0.27	-0.72	-0.45
	(0.75)	(0.84)	(0.84)	(0.86)
Low Incidence	0.21	0.35	-0.67	-0.46
	(0.77)	(0.88)	(0.86)	(0.90)
High Concentration	0.12	0.24	-0.69	-0.48
	(0.72)	(0.82)	(0.80)	(0.84)
Medium Concentration	0.15	0.28	-0.75	-0.50
	(0.77)	(0.87)	(0.86)	(0.88)
Low Concentration	0.19	0.31	-0.65	-0.43
	(0.76)	(0.86)	(0.87)	(0.89)
N	8054	8133	9495	10003

In both ELA and math, both current and reclassified Els perform better in elementary school than in middle school (Table 25). In 2012-13, RELs achieved about .30 SDs above the mean in elementary school and at about the mean in middle school on their ELA exams. This trend makes sense: in elementary school there are fewer RELs, and the students who have already reclassified in the earlier grades tend to be objectively different and higher achieving than those who reclassify in later grades. As more CELs are reclassified over time and the pool of RELs becomes larger, the average achievement of the latter group decreases. New immigrants enrolling in schools each year who are not proficient in English also tend to be low achieving, further pulling down average CEL test scores.

The decreased performance for CELs in middle school can be explained using similar logic. As more CELs reclassify after every year, the students who remain are necessarily the lowest performing students. Considering that the majority of Els in North Carolina enroll in Kindergarten[12], current Els in middle school are likely students who have not been able to become proficient in English after 5 years or more. As well, the middle school CEL group includes a smaller group of recent immigrants who have also not reached the benchmarks for English proficiency.

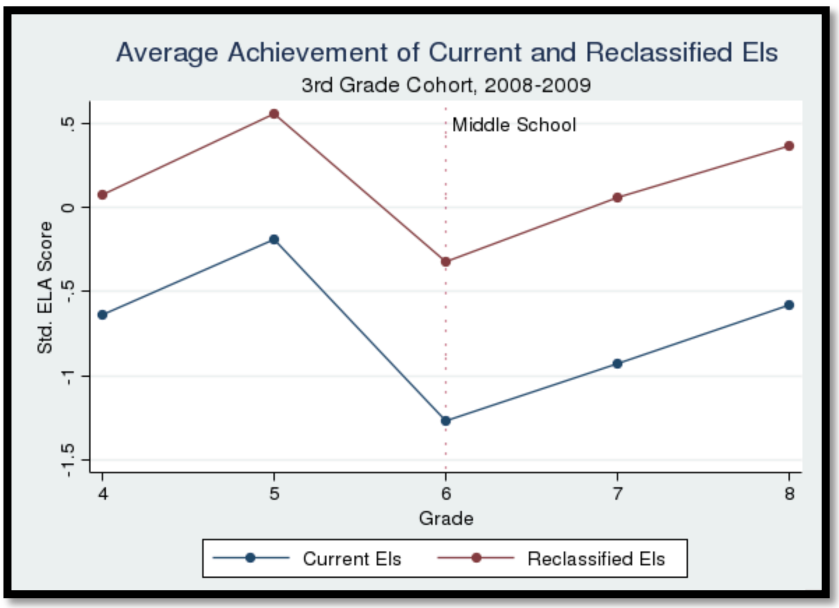

***Figure 16*. Average standardized ELA scores by grade and El status.**

Disaggregating these data further to show differences by grade reveals a striking drop of about .3 standard deviations in average ELA achievement for both current and reclassified Els in 6th grade. Figure 16 shows the average achievement of Els who were in 3rd grade in 2008-09. There is a clear dip in achievement for both groups between 5th and 6th grade, the year that

12 Author's Calculation using NC DPI data

most students transition from elementary school to middle school. While achievement in ELA increases in each grade in middle school for both current and reclassified Els, neither group regains the achievement level they had reached by 5th grade, the end of elementary school. A similar pattern emerges for NESs, indicating that the transition in middle school has a negative effect across the population of public school students.

Achievement also varies by urbanicity, school El concentration, and immigrant growth profile, as shown in Table 25. Urbanicity has more of an impact on REL than CEL achievement. RELs perform appreciably better in both ELA and math in urban areas compared to either rural or suburban areas. For both El subgroups, ELA achievement is highest in Low incidence schools and both ELA and math achievement is lowest in Established and Growing schools. For RELs there is a negative linear relationship between the proportion of Els in a school and math and ELA achievement. On the contrary, CELs have the lowest performance in medium concentration schools, and do slightly better in both high and low El concentration schools.

Treatment variables. The treatment variables include three levels of classroom exposure (singleton, mainstream, and segregated), whether a teacher has an ESL credential, and whether a teacher taught at least two Els the previous year.

Table 26 describes basic characteristics of ELA classes with different levels of exposure. Segregated classrooms, that is classrooms in which there are no NESs, are the least prevalent type of classroom and enroll about 2% of the El population (4% of the CEL population and less than 1% of the REL population). Despite the low prevalence, these contexts are important to understand from a policy perspective because they represent a “pull out” setting in which Els are removed from the mainstream classroom to receive specialized instruction. In fact, 21% of these classes have a course title that allows them to be categorized as a "pull out" ESL class, such as "Sheltered math" or "SIOP Reading".

Table 24 ***ELA Classroom Characteristics by Level of Exposure, El Status***

	CEL Segregated	Mainstream	Singleton	REL Segregated	Mainstream	Singleton
ESL Cred.	0.62	0.02	0.01	0.13	0.02	0.01
	(0.49)	(0.14)	(0.11)	(0.34)	(0.12)	(0.12)
El Experience	0.45	0.64	0.43	0.50	0.68	0.49
	(0.50)	(0.48)	(0.50)	(0.50)	(0.47)	(0.50)
Class Size	10.69	22.48	21.38	15.96	23.68	22.99
	(6.74)	(4.54)	(5.47)	(8.44)	(4.42)	(5.13)
Peer Ach.	-0.74	-0.28	-0.15	-0.19	-0.01	0.21
	(0.78)	(0.50)	(0.56)	(0.79)	(0.54)	(0.58)
Elementary	0.45	0.49	0.48	0.69	0.45	0.45
	(0.50)	(0.50)	(0.50)	(0.46)	(0.50)	(0.50)
ESL Course	0.22	0.01	0.03	0.15	0.01	0.02
	(0.41)	(0.10)	(0.16)	(0.36)	(0.10)	(0.15)
Advanced	0.00	0.01	0.02	0.02	0.03	0.05
	(0.07)	(0.09)	(0.13)	(0.15)	(0.18)	(0.22)
Remedial	0.06	0.01	0.03	0.03	0.00	0.01
	(0.25)	(0.11)	(0.16)	(0.17)	(0.06)	(0.07)
Years Exp.	10.48	9.90	10.87	11.17	10.25	11.22
	(8.94)	(8.89)	(9.24)	(9.26)	(8.76)	(9.06)
New Teacher	0.27	0.28	0.26	0.21	0.26	0.23
	(0.44)	(0.45)	(0.44)	(0.41)	(0.44)	(0.42)
Teacher Test Score	0.20	0.10	0.08	0.17	0.09	0.11
	(0.66)	(0.61)	(0.64)	(0.54)	(0.56)	(0.58)
Observations	49938			43554		

Math Results available in Table B14 in Appendix B.

It is evident that segregated classrooms are dramatically different than all other classrooms. Most striking is 55% of these classrooms are taught by a credentialed ESL teacher (63% for CELS and 13% for RELs), in contrast with less than 3% of the other classrooms. The proportion of certified ESL teachers teaching segregated classes is higher for CELs and lower for RELs in middle school than elementary school. Segregated classrooms are typically about half the size of the other types of classes, likely because they are special support classes. They are also more likely to be categorized as remedial than classrooms with higher levels of exposure to

NES. The much lower peer scores in segregated classrooms also suggest that these are remedial or special support classes.

Using a linear probability model, I find Els in segregated classrooms are just as likely to have a new teacher (B=-.005, p=.356[13]) and Els in singleton classrooms are less likely to have a new teacher compared to Els in mainstream classrooms (B=-.03, p<.001[22]). Additionally, teachers of singleton classrooms average about 1 more year of experience than those in either segregated or mainstream classrooms (B=1.25, 1.2, p<.001[14]).

In sum, while there are clear differences in the student composition of classrooms with different levels of exposure, there is little indication that Els in segregated classrooms are being assigned to teachers that are less qualified in terms of experience. The differences in experience and proportion of new teachers are statistically significant, but arguably not practically significant.

Further description of exposure, ESL credentialing, and El experience are provided in sections 1 and 2 of this chapter.

School context of reception: Co-ethnic community and mode of incorporation. The theoretical framework described above suggests that the school context of reception, particularly the strength of the co-ethnic community and the presence of a receptive mode of incorporation, are important factors related to student achievement. Variables that measure the strength of the co-ethnic community include the proportion of teachers of the same race as the student who work in a school, the proportion of Els in a school, and the rate of growth of

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[13] Results of regression $Y = \beta_0 + \beta_1 Segregated + \beta_2 Singleton$ where Y is an indicator that a teacher is in her first three years of teaching.

[14] Results of regression $Y = \beta_0 + \beta_1 Segregated + \beta_2 Singleton$ where Y is a continuous measure of teacher experience in years.

the school El population since 2001. Indicators of a receptive mode of incorporation are whether a school offers bilingual or heritage language programs, the percent of teachers who have an ESL credential, and an even distribution of Els across a school.

Differences between CELs, RELs, and NESs. The proportion of teachers who are the same race/ethnicity as a student is low for Els overall, a natural result given that Els are typically Latino and teachers are typically White (Table 27, below). However, RELs are taught by a slightly larger proportion of same race teachers. Reclassified Els tend to be more diverse than Current Els, which could explain the increased racial/ethnic matching. On average, Els attend schools where 20% of their peers are also Els. CELs are slightly more concentrated in schools with other Els than RELs.

The distribution of RELs and CELs across schools with different immigrant growth profiles varies only slightly. While both RELs and CELs are enrolled more frequently in New Destination and Established and Growing schools, CELs make up a greater proportion of students in both types of school, while RELs make up a greater proportion of the El population in Established and Stable Schools and Low Incidence schools. All RELs were once CELs, so the differences in the distribution of Els within these schools could indicate that Els reclassify more quickly in Established and Stable or Low Incidence schools.

Els are not distributed across urbanicities evenly. A little more than 40% of Els live in both rural and urban areas, while only half that proportion live in suburban areas. There is only a small difference in the proportion of CELs or RELs who attend schools that offer bilingual programs or heritage language programs. In total, there are about 347 such schools, with the majority located in urban areas.

The proportion of ESL certified teachers in schools enrolling RELs and CELs is approximately equivalent. In section two of this chapter we saw that a larger proportion of CELs were taught by ESL credentialed teachers. Differential access to these teachers then is related to how CELs and RELs are sorted within schools and not to how they are sorted between schools.

Taken together, these variables tell us that CELs and RELs commonly attend similar types of schools. This is to be expected because student transition from one label to another without necessarily changing schools. However, there are important differences between the schools of RELs and CELs in the size of the El population and the growth of the immigrant population that may have important implications for their academic experience.

Variation across school level. Interesting differences in contextual characteristics emerge when comparing students in elementary and middle schools (Table 27). Variability in unevenness follows opposite trends for RELs and CELS. Whereas unevenness decreases for RES when they enter middle school, it increases for CELs. Students' co-ethnic adult and peer community decreases in middle school. The average El population in a school decreases 6% and the percent of teachers who are of the same race/ethnicity decreases by about 1%. These changes may be attributable to the structural changes discussed above. Another notable difference is that middle schools offer more bilingual and heritage language programs than elementary schools. This is largely driven by an increase in heritage language programs, as only 11% of bilingual programs are located in middle schools. As mentioned previously, the departmentalized structure of middle schools allows for more specialized course offerings, which can include language classes.

The differences in the proportions of Els enrolled in elementary and middle schools with different immigrant growth profiles provide evidence of localized growth in the El population. Even within the same district, Els attend schools that have different immigrant growth histories. That is, the profiles of their elementary schools are at times different than the profiles of the middle schools located in the same area. There is a large reduction in the proportion of Els attending New Destination schools in middle school as compared to elementary school. This decrease is offset by an increase in the number of students enrolled in schools that are Established and Growing.

Table 25 ***Summary of School Context Variables Used in Analyses, by El Status, ELA***

	Reclassified El			Current El		
	ES	MS	Pooled	ES	MS	Pooled
Unevenness	9.18	6.17	7.54	10.8	15.52	13.27
	(3.44)	(1.48)	(2.97)	(5.45)	(9.38)	(8.11)
School % El	22.37	17.44	19.69	24.84	17.55	21.02
	(14.19)	(11.02)	(12.80)	(15.10)	(11.40)	(13.78)
%Teacher Same Race	6.46	5.61	6.00	4.54	4.44	4.49
	(20.18)	(19.12)	(19.62)	(16.02)	(16.23)	(16.13)
School % ESL Cred	3.13	3.71	3.45	3.4	3.64	3.53
	(6.74)	(6.72)	(6.73)	(7.26)	(6.73)	(6.99)
Bilingual/Heritage	0.05	0.08	0.06	0.06	0.11	0.08
	(0.22)	(0.26)	(0.25)	(0.23)	(0.31)	(0.28)
New Destination School	0.36	0.25	0.3	0.36	0.28	0.32
	(0.48)	(0.43)	(0.46)	(0.48)	(0.45)	(0.47)
Established and Growing	0.3	0.33	0.32	0.37	0.37	0.37
	(0.46)	(0.47)	(0.47)	(0.48)	(0.48)	(0.48)
Established and Stable	0.11	0.17	0.15	0.1	0.15	0.13
	(0.32)	(0.38)	(0.35)	(0.29)	(0.36)	(0.33)
Low Incidence	0.22	0.25	0.24	0.17	0.2	0.19
	(0.42)	(0.43)	(0.43)	(0.38)	(0.40)	(0.39)
N (Els)	54,488	65,109	119,089	74,197	83,400	157,597

Math Results available in Table B15 in Appendix B.

Other school characteristics. Summary statistics of school variables indicate that elementary schools enroll a greater proportion of CELs, which makes sense given that as Els advance through each grade more students reclassify, and this decrease in the population of

CELs is not offset by the arrival of new CELs (Table B16 in Appendix B). Compared to RELs, CELs are enrolled in slightly smaller schools that have a larger minority and low-income population. CELs are also enrolled in schools that spend more per pupil but that are in districts that receive slightly less Title III funding than those enrolling RELs.

Variation across school level. When Els transition to middle school, overall school size increases, while the proportion of minority and low-income students decreases.
There is substantial drop in per pupil expenditures when students move to middle school. In the average schools attended by RELs, per pupil expenditure drops from around $8,100 to $7,100. School enrolling CELs see a slightly smaller drop from $8,506 to $7,833. The funding formula for Els helps explain these changes. North Carolina does not allocate additional resources for RELs, but apportions additional funds to schools based on the school's proportion of CELs. In middle schools there are fewer CELs and more RELs, and so additional funding decreases overall. Title III funds, which are allocated to districts based on the number, not the proportion, of CELs, decreases slightly but to a lesser extent than per pupil expenditure.

Three indicators of teacher quality are measured at the school level: the proportion of teachers who are fully credentialed, the proportion of teachers who are nationally board certified, and the proportion of teachers with an advanced degree. There is a decrease across all three measures when Els move from elementary to middle school.

Student characteristics.

Differences between CELs and RELs. In keeping with existing literature (Abedi & Liquanti, 2013; Saunders & Marcelletti, 2012) and the findings presented above, there are significant differences between the achievement and personal characteristics of CELs and RELs. The stark differences between current and reclassified Els indicates that certain types of students are more likely to gain English proficiency and exit El status than others, be it because of personal or school characteristics.

For descriptive purposes, Figure 17 shows the proportion of CELs, RELs, and NESs in four quartiles of ELA achievement. The average ELA achievement of all students in the bottom quartile of achievement is about 1.3 standard deviations below average, whereas the average achievement of all students in the top quartile is about 1.22 standard deviations above average. Overall, about 57% of CELs are in the bottom quartile of achievement, compared to only 16% of RELs and 23% of NES. In contrast, only 3% of CELs are in the top quartile of ELA achievement compared to 22% of their REL peers and 26% of their NES peers.

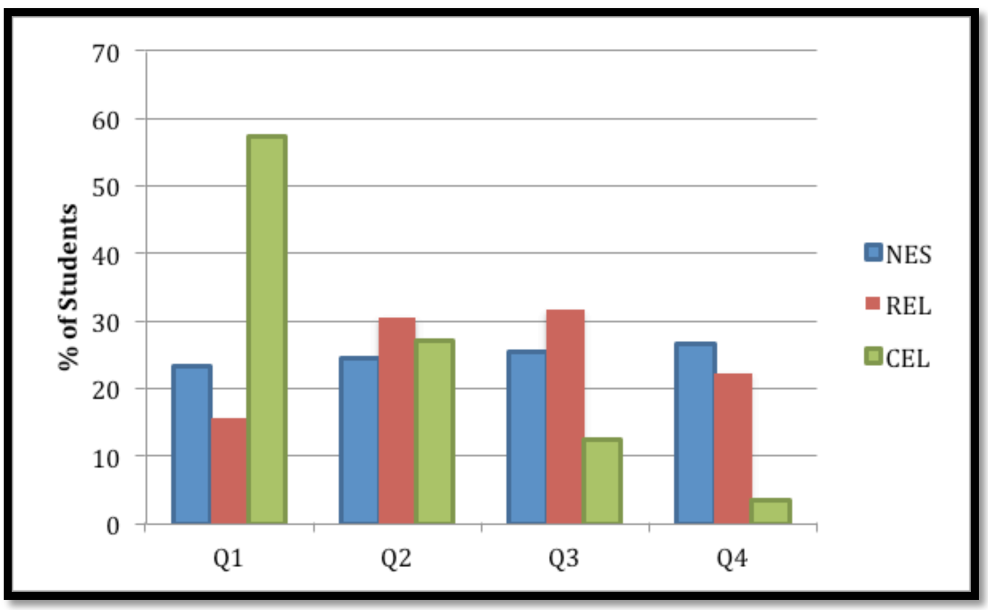

***Figure 17*. Proportion of students in each quartile of ELA achievement, by El status.**

There are slight differences in the racial/ethnic background of CELs and RELs. The vast majority of both CELs and RELs are Latino (82 and 80% in 2012-13), with the next largest group comprised of Asians. There are a greater proportion of Asians who are RELs than CELs; for

Latinos the opposite is true. Interestingly, there is a significant difference (t=-38.23, p<.001) in the proportion of males across the El status groups. Males make up 56% of the CEL population and only 47% of the reclassified El population. This gender difference supports other research indicating that there is an increased risk of academic underachievement for boys of color (Noguera, 2003; Thomas & Stevenson, 2009).

Table 26 ***Summary of Student Variables Used in Analyses, by El Status, ELA***

	Reclassified El			Current El		
	ES	MS	Pooled	ES	MS	Pooled
Prior Achievement	.02	.02	0.02	-.84	-.88	-0.87
	(.75)	(.73)	(0.75)	(.82)	(.86)	(0.84)
Years CEL	1.67	0.91	1.25	4.00	3.89	3.94
	(1.49)	(1.21)	(1.40)	(1.25)	(1.37)	(1.36)
Male	0.47	0.47	0.47	0.54	0.55	0.54
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
White	0.05	0.05	0.05	0.03	0.04	0.03
	(0.23)	(0.22)	(0.22)	(0.18)	(0.18)	(0.18)
Asian	0.14	0.14	0.14	0.09	0.10	0.10
	(0.35)	(0.34)	(0.34)	(0.28)	(0.30)	(0.29)
Black	0.02	0.02	0.02	0.02	0.03	0.03
	(0.15)	(0.15)	(0.15)	(0.15)	(0.16)	(0.16)
Latino	0.77	0.78	0.77	0.85	0.82	0.83
	(0.42)	(0.42)	(0.42)	(0.36)	(0.38)	(0.37)
Other Race	0.02	0.01	0.02	0.01	0.01	0.01
	(0.13)	(0.12)	(0.12)	(0.11)	(0.11)	(0.11)
Special Needs	0.04	0.03	0.03	0.12	0.12	0.12
	(0.19)	(0.17)	(0.18)	(0.33)	(0.32)	(0.33)
Gifted	0.14	0.15	0.15	0.02	0.02	0.02
	(0.35)	(0.36)	(0.35)	(0.13)	(0.12)	(0.13)
Moved in Year	0.05	0.04	0.04	0.09	0.09	0.09
	(0.21)	(0.19)	(0.20)	(0.29)	(0.28)	(0.28)
Summer Move	0.09	0.06	0.07	0.12	0.08	0.10
	(0.29)	(0.23)	(0.26)	(0.32)	(0.27)	(0.30)
Forced Move	0.03	0.37	0.21	0.03	0.32	0.18
	(0.16)	(0.48)	(0.41)	(0.16)	(0.47)	(0.39)
Days Absent	4.53	5.50	5.06	4.84	6.72	5.83
	(4.56)	(5.95)	(5.38)	(4.77)	(7.39)	(6.35)
Under Age	0.01	0.01	0.01	0.01	0.02	0.02
	(0.08)	(0.11)	(0.10)	(0.10)	(0.14)	(0.12)
Over Age	0.16	0.20	0.18	0.30	0.39	0.35
	(0.37)	(0.40)	(0.39)	(0.46)	(0.49)	(0.48)
Free Lunch	0.81	0.75	0.78	0.88	0.71	0.79
	(0.40)	(0.43)	(0.42)	(0.33)	(0.46)	(0.41)
Observations	54,416	64,681	119,097	70,368	77,557	147,925

Math Results available in Table B17 in Appendix B.

The difference between the proportion of gifted and disabled students across El status is telling. There are nearly as many gifted reclassified Els as NES (14% vs. 18%) but nearly no gifted current Els (1%). It might be that schools do not allow students to enroll in gifted classes until they have demonstrated proficiency in English. The numbers are reversed for disability (the majority of which are learning disabilities): CELs are disproportionately categorized as having a disability, with 15% of that population being identified as disabled compared to 12% of the overall population. Only 4% of RELs have are labeled as having a disability. For most, disability is a permanent status (less than 5% of disabled students change status), thus the discrepancy between the disability in current and reclassified Els suggests that it is highly unlikely for a disabled El to ever reclassify (otherwise there would be a more similar proportion of current and reclassified Els with disabilities).

In terms of mobility, CELs are more than twice as likely to move within the school year than RELs. CELs are also considerably more likely to be overage for their grade (a rough indicator that a student has repeated a grade). Thirty-three percent of CELs are overage, compared to 19% of reclassified Els.

Like Els nationally, in North Carolina Els tend to be from lower income families than their NES peers. In 2012-13, nearly 90% of current Els and 84% of reclassified Els were eligible for the school lunch program (meaning parents earned less than 43,000 dollars for a family of four). In contrast, only 50% of NESs were eligible for the school lunch program. The relatively small gap in the proportion of low-income current and reclassified Els suggests that something other than family socioeconomic status differentiates the academic trajectories these two groups of students.

Variation across school level. Most student level characteristics do not change in the move from elementary to middle school. Similar to the general NES population, achievement decreases, the number of absences increases, and the proportion of students eligible for free and reduced price lunch decreases when Els enter middle school.

Classroom characteristics. Results thus far have demonstrated that there are many differences between the personal and academic characteristics of RELs and CELs. Differences in classroom characteristics further support this point. Most notably, peer achievement is substantially lower in the classrooms of CELs. On average, the peers of CELs perform about a third of standard deviation lower than the peers of RELs in ELA. Further, on average, CELs have a greater proportion of peers scoring in the lowest quartile of ELA achievement than their REL counterparts. About 47% of CELs' classroom peers (both El and NES) are in the bottom quartile of achievement (Q1), compared to just 26% of RELs' peers and 23% of NESs' peers. At the other end other spectrum, only 7% of CELs' peers are in the top quartile of achievement (Q4), compared to 21% of the peers of RELs and 26% of the peers of NESs (Figure 18).

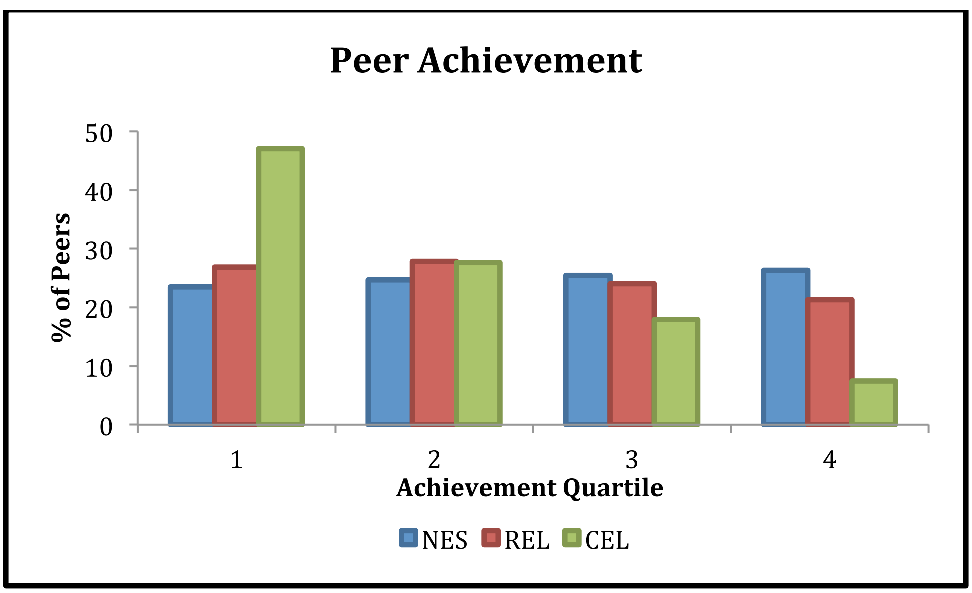

***Figure 18*. Average peer standardized ELA achievement achievement by quartile.**

Of course, these results follow from earlier evidence that CELs are more likely to be in classrooms with other CELs, a group that is on average low performing. However, on average CELs are in classes with about 70% NES. When CELs are in classes with the mean proportion of NES (≈70%), their average peer score is about .4 standard deviations below the mean for all students. In sum, CELs are not only concentrated in classes with low-achieving CELs, but also with low-achieving NESs.

Another difference in the classrooms of CELs and RELs is their demographic composition. CELs are in classrooms with a higher concentration of minorities and low-income students, whereas RELs are in classrooms with more White and non-poor students. That being said, both groups of Els are in classes that are majority-minority and majority low-income.

Variation across school level. Differences in classrooms by school level are not surprising given findings reported above. There are a greater proportion of RELs in advanced classes and a greater proportion of CELs in remedial classes. The first section of this chapter showed that RELs become more exposed to NESs in middle school. Further confirmation of this change is presented in Table 29. The proportion of Els within a classroom decreases by about 7% for RELs when they get to middle school, but only 2% for CELs. The decrease for CELs is driven by a decrease in the proportion of their peers that are RELs.

Table 27 ***Summary of Classroom Variables Used in Analyses, by El Status, ELA***

	Reclassified El			Current El		
	ES	MS	Pooled	ES	MS	Pooled
Class Size	22.58	24.56	23.66	21.84	22.51	22.19
	(3.87)	(4.65)	(4.43)	(4.18)	(5.62)	(5.00)
Peer Achievement	-0.06	-0.03	-0.04	-0.24	-0.43	-0.34
	(0.48)	(0.60)	(0.55)	(0.46)	(0.56)	(0.52)
ESL Course	0.02	0.00	0.01	0.02	0.01	0.02
	(0.14)	(0.06)	(0.10)	(0.15)	(0.12)	(0.13)
Advanced	0.00	0.06	0.03	0.00	0.02	0.01
	(0.00)	(0.24)	(0.18)	(0.00)	(0.13)	(0.09)
Remedial	0.00	0.01	0.00	0.00	0.02	0.01
	(0.00)	(0.08)	(0.06)	(0.00)	(0.14)	(0.10)
Class % El	0.27	0.21	0.24	0.32	0.30	0.31
	(0.18)	(0.15)	(0.16)	(0.21)	(0.24)	(0.23)
Class % CEL	0.10	0.07	0.08	0.24	0.24	0.24
	(0.12)	(0.10)	(0.11)	(0.19)	(0.24)	(0.22)
Class % REL	0.16	0.14	0.15	0.08	0.05	0.06
	(0.12)	(0.10)	(0.11)	(0.09)	(0.07)	(0.08)
Class % Latino	0.26	0.22	0.24	0.31	0.29	0.30
	(0.19)	(0.16)	(0.17)	(0.22)	(0.22)	(0.22)
Class % Black	0.25	0.26	0.26	0.27	0.29	0.28
	(0.21)	(0.21)	(0.21)	(0.21)	(0.22)	(0.22)
Class % White	0.40	0.44	0.42	0.34	0.34	0.34
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)
Class % FRPL	0.60	0.57	0.59	0.67	0.60	0.63
	(0.27)	(0.24)	(0.26)	(0.25)	(0.26)	(0.26)
Class % Male	0.50	0.50	0.50	0.51	0.52	0.51
	(0.12)	(0.12)	(0.12)	(0.13)	(0.14)	(0.14)
Observations	54,416	64,681	119,097	70,368	77,557	147,925

Math Results available in Table B18 in Appendix B.

Average peer achievement in the average CEL and REL classroom becomes more differentiated in middle school. Whereas average peer achievement increases for RELs, it becomes about two times lower for CELs (Figure 19). The increasing peer achievement for RELs is coupled with a larger proportion of RELs being enrolled in advanced classes.

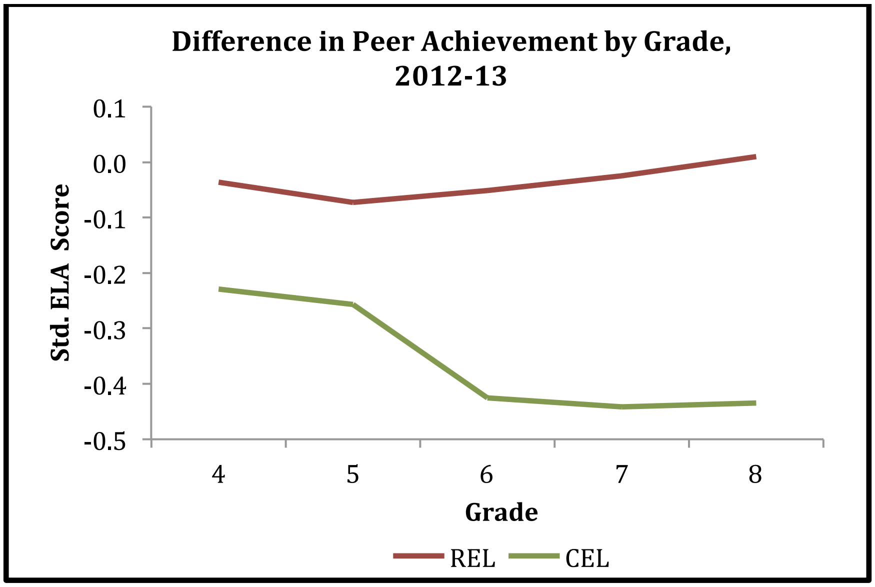

***Figure 19*. Average peer standardized ELA achievement, by El status and grade.**

Results of Regression Analyses

In the next two sections I present results from the four models described in Chapter 3. The most basic model uses OLS regression, the next model uses school fixed effects, the third model uses student fixed effects, and the final model uses student and school fixed effects. Each model presents different trade-offs between external and internal validity. Because the OLS model does not include a school or student fixed effect, estimates are based on variation from across the sample and external validity is maximized. However, estimates are likely biased by non-random sorting of students into classrooms and schools, and so internal validity is minimized.

The student/school fixed effects model produces estimates based on a restricted sub-sample of students who have experienced both the treatment and the control conditions while enrolled in one school. Depending on the treatment variable of interest, this sub-sample may be less than 5% of the original sample (see Table C9 in Appendix C), limiting the external validity of results. Despite this limitation, these results, and results estimated using student fixed effects alone, are privileged in the following analyses because they maximize internal validity. Moving forward, it is important to keep in mind that while the results of the student and student/school fixed effects models best approximate a causal estimate, they may not generalize to the overall population.

To get a sense of the basic model specification and relationships between variables, Table 30 shows the results estimated using OLS regression on the full ELA and math samples. Hypothesis 1 and 2 are specifically related to the effect of the treatment variables on achievement. Estimates using the full model show that in both ELA and math, there is a significant relationship between classroom exposure, indicated by enrollment in either a segregated or singleton classroom, and both ELA and math achievement. There is a moderate negative effect of being in a segregated classroom and a small positive effect of being in a singleton classroom on achievement. There is also evidence of a small negative effect of having an ESL certified teacher on El achievement in both math and ELA. It is impossible to know if these results are biased by negative sorting of the most challenging Els into classes taught by credentialed teachers.

Table 28 ***OLS Regression, ELA and Math Samples***

	ELA	Math		ELA	Math
Treatment			Class Controls		
Segregated	-0.16***	-0.34***	Class Size	0.00***	0.00
	(0.01)	(0.01)		(0.00)	(0.00)
Singleton	0.03***	0.03***	Peer Achievement	0.01***	0.05***
	(0.00)	(0.00)		(0.00)	(0.00)
ESL Cert	-0.04***	-0.02*	Years Experience	0.00***	-0.00
	(0.01)	(0.01)		(0.00)	(0.00)
El Exp	0.01	0.01*	New Teacher	-0.01**	-0.02***
	(0.00)	(0.00)		(0.00)	(0.00)
School Context			ESL Course	-0.03**	0.11***

	ELA	Math
Unevenness of CEL	0.01***	0.01***
	(0.00)	(0.00)
Unevenness of REL	0.02***	0.01
	(0.00)	(0.01)
% Teacher Same Race	-0.00	0.01***
	(0.00)	(0.00)
School % El	0.00	0.00
	(0.00)	(0.00)
School % ESL Cred	0.01**	-0.02***
	(0.00)	(0.00)
Bilingual/Heritage	-0.01**	-0.02***
	(0.00)	(0.00)
New Destination School	-0.04***	-0.02***
	(0.00)	(0.00)
Established and Growing	-0.03***	-0.02***
	(0.00)	(0.00)
Established and Stable	-0.02***	-0.02***
	(0.00)	(0.00)
Student Controls		
Prior Achievement	0.55***	0.62***
	(0.00)	(0.00)
Years CEL	-0.06***	-0.06***
	(0.00)	(0.00)
Current El	-0.11***	0.04***
	(0.00)	(0.00)
Exiter	-0.26***	-0.07***
	(0.00)	(0.00)
Mover	0.02***	-0.02***
	(0.00)	(0.00)
Male	-0.00	0.01***
	(0.00)	(0.00)
White	0.07***	0.04**
	(0.02)	(0.02)
Asian	0.01	0.18***
	(0.00)	(0.00)
Black	-0.00	-0.04***
	(0.01)	(0.01)
Other Race	0.03**	0.05***
	(0.01)	(0.01)
Special Needs	-0.12***	-0.08***
	(0.00)	(0.00)
Gifted	0.26***	0.23***
	(0.00)	(0.00)
Moved in Year	-0.18***	-0.14***
	(0.00)	(0.00)
Summer Move	0.01*	0.00
	(0.00)	(0.00)

	ELA	Math
	(0.01)	(0.02)
Advanced	0.19***	0.09***
	(0.01)	(0.00)
Remedial	-0.15***	-0.04**
	(0.00)	(0.01)
Teacher Avg. Test Score	0.01***	0.03***
	(0.00)	(0.00)
School Controls		
School Size	-0.00	-0.00***
	(0.00)	(0.00)
School Size Sq.	0.00	0.00***
	(0.00)	(0.00)
PPE	0.00	0.00***
	(0.00)	(0.00)
Title 3 Funds	0.01***	0.01***
	(0.00)	(0.00)
% Full Credential	-0.17***	-0.00
	(0.03)	(0.03)
% NBC	0.13***	0.06***
	(0.02)	(0.02)
% Adv. Degree	-0.05***	-0.04**
	(0.01)	(0.01)
School % Minority	-0.02**	-0.04***
	(0.01)	(0.01)
School % Free Lunch	0.01	0.03***
	(0.01)	(0.01)
Elementary	0.27***	0.19***
	(0.00)	(0.00)
Rural	-0.01***	-0.02***
	(0.00)	(0.00)
Urban	-0.02***	-0.03***
	(0.00)	(0.00)
Year		
2010-2011	-0.02***	0.02***
	(0.00)	(0.00)
2011-2012	-0.01	0.04***
	(0.00)	(0.01)
2012-2013	0.08***	-0.04***
	(0.01)	(0.01)
2009-2010	-0.06***	0.01*
	(0.00)	(0.00)

	ELA	Math		ELA	Math
Forced Move	-0.43***	-0.35***			
	(0.00)	(0.00)			
Days Absent	-0.00***	-0.01***			
	(0.00)	(0.00)			
Under Age	-0.00	0.07***	Constant	0.32***	0.29***
	(0.01)	(0.01)		(0.03)	(0.03)
Over Age	-0.07***	-0.06***	R^2	0.61	0.62
	(0.00)	(0.00)	F	7171.08	7030.24
Free Lunch	-0.05***	-0.04***	Observations	267002	277174
	(0.00)	(0.00)			

The variables labeled "school context" represent measures of the size of the co-ethnic community as well as a school's welcoming policies or practices, as explained in the theoretical framework. There is a positive relationship between unevenness and achievement in both math and ELA. The relationship between the percent of teachers of the same race and the percent of ESL certified teachers differs in both sign and significance for math and ELA. There is evidence that having a same race teacher has a positive effect on math achievement but no effect on ELA achievement. Likewise, the proportion of ESL credentialed teachers has a negative effect on math achievement but a positive effect on ELA achievement. For both math and ELA, the proportion of Els in a school has a positive effect, however this effect is only significant in ELA. Finally, these initial results suggest that attending a school that offers bilingual or heritage language programming or not attending a low incidence school (the base group for testing the effect of attending schools with different immigrant growth profiles) has a negative effect on math and ELA achievement.

There are a few control variables that have a sizable impact on both math and ELA achievement. Prior achievement is the most strongly related to achievement in both math and ELA. Other high leverage control variables are whether a student is identified as gifted, whether a student changes schools within a particular year or enters middle school, whether a student was only enrolled in NC schools for 1 year, and whether students are assigned to remedial or advanced classes. The inclusion of these controls is particularly important given the findings described above suggesting quite a bit of variation in these variables between RELs and CELs.

Model specification was based on theory, previous research, and available data. However, the models as specified are able to explain at most about 60% of the variation in El achievement, as indicated by the R^2. About 50% of the variation in achievement is predicted solely by the inclusion of prior achievement. It is important to keep these statistics in mind to understand and interpret the results that are explained in the subsequent sections. While there are important relationships between the variables of interest included in the model, a substantial proportion of the variation in achievement is explained by variables that are not included.

Hypothesis 1. Teachers who have either earned a credential to teach Els or who, for whatever reason, taught at least two Els in the previous year, will have a positive impact on the ELA and math achievement of Els. Table 31 shows estimates of the relationship between having an ESL credential across all models and samples. Results from the student and student/school fixed effects models indicate that being taught by an ESL credentialed teacher only has an effect on math achievement for RELS in Middle School. Results from OLS and school fixed effects models suggest CELs taught by an ESL credentialed teacher perform worse in ELA that their peers taught by a credentialed teacher.

Table 29 ***Estimated effect of ESL Credential, All Samples***

Effect of Credential	Sch/St FE	Student FE	School FE	OLS
CELs ELA	-0.02	-0.02	-0.07**	-0.06**
	(0.01)	(0.01)	(0.02)	(0.02)
ES	-0.02	-0.01	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.03)
MS	-0.02	-0.02	-0.11**	-0.10**
	(0.02)	(0.02)	(0.04)	(0.04)
REL ELA	0.00	-0.00	0.01	0.00
	(0.01)	(0.01)	(0.02)	(0.02)
ES	0.02	0.02	0.01	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)
MS	0.00	0.03	0.03	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
CEL Math	-0.01	0.01	-0.03	-0.02
	(0.02)	(0.01)	(0.03)	(0.03)
ES	-0.01	-0.00	-0.00	0.00
	(0.02)	(0.02)	(0.03)	(0.03)
MS	-0.00	-0.01	-0.09	-0.09
	(0.03)	(0.03)	(0.05)	(0.05)
REL Math	0.01	-0.00	-0.02	-0.03
	(0.02)	(0.02)	(0.03)	(0.03)
ES	-0.01	-0.01	-0.03	-0.03
	(0.02)	(0.02)	(0.03)	(0.03)
MS	0.11***	0.06	-0.01	-0.01
	(0.03)	(0.03)	(0.05)	(0.06)

Note: Results are excerpted from full tables of results available in Appendix B
Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001

El experience. Nearly 20 times more teachers have experience teaching at least two Els in the previous year than have an ESL credential. Results from the student and student/school fixed effects models indicate a significant and positive relationship between being taught by an El experienced teacher on ELA and math achievement for RELs and CELs across both elementary and middle school (Table 32). These results mean that when a student changes from having an El inexperienced teacher to an El experienced teacher there is a significant positive effect. The positive effect estimated using the school/student fixed effect model indicates that moving schools is not driving differences in the effect of El experience on achievement.

Table 30 ***Estimated Effect of El Experience, All Samples***

Effect of Experience	Sch/St FE	Student FE	School FE	OLS
CELs ELA	0.03***	0.02***	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
ES	0.02*	0.02*	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.03***	0.04***	-0.02	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
REL ELA	0.02***	0.03***	0.01	0.01*
	(0.01)	(0.01)	(0.01)	(0.01)
ES	0.02*	0.02**	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.02*	0.03***	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
CEL Math	0.03***	0.03***	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
ES	0.00	0.00	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.04***	0.05***	0.02*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
REL Math	0.02***	0.02***	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
ES	0.01	0.00	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.02**	0.04***	0.02	0.02
	(0.01)	(0.01)	(0.01)	(0.01)

Note: Results are excerpted from full tables of results available in Appendix B
Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Hypothesis 2: The relationship between segregation, in terms of exposure of Els to NESs, and achievement will be conditional on whether an El has access to a positive institutional agent, as described above. In this section I first describe the main effects of exposure and then analyze interactions of exposure and teacher characteristics in order to verify the hypothesis.

***Exposure: Main effects*.** Results indicate that after controlling for both non-random sorting of students in to schools and classrooms, there is no significant relationship between an REL or CEL being in a segregated classroom and either ELA or math achievement in either elementary or middle school (Table 33). Less restrictive models suggest a negative relationship between a CEL being in a segregated classroom and both ELA and math achievement, but estimates may suffer from omitted variable bias. For instance, the negative and significant effect between being in a segregated math class and CEL math achievement uncovered using the student fixed effects model (B=-.24) may be attributable to the effect of an unobserved school level variable whose value changes when a student moves to a different school rather than the effect of being in a segregated classroom setting. There is no evidence that being in a segregated classroom impacts REL achievement across any of the models.

Table 31 ***Estimated Effect of Segregated Classes, All Samples***

	Sch/St FE	Student FE	School FE	OLS
Effect of Segregated				
CELs ELA	0.02	-0.00	-0.19***	-0.19***
	(0.01)	(0.01)	(0.04)	(0.04)
ES	0.02	0.03	-0.08***	-0.09**
	(0.03)	(0.03)	(0.02)	(0.03)
MS	0.00	-0.01	-0.22***	-0.22***
	(0.02)	(0.02)	(0.05)	(0.05)
REL ELA	-0.05	-0.03	-0.04	-0.03
	(0.03)	(0.03)	(0.03)	(0.03)
ES	-0.02	-0.01	-0.06	-0.04
	(0.04)	(0.03)	(0.03)	(0.03)
MS	-0.08	-0.08	-0.04	-0.05
	(0.06)	(0.05)	(0.04)	(0.04)
CEL Math	-0.00	-0.24***	-0.11**	-0.39**
	(0.02)	(0.02)	(0.03)	(0.13)
ES	0.08	-0.08	-0.07	-0.38*
	(0.05)	(0.05)	(0.07)	(0.16)
MS	-0.04	-0.18***	-0.13***	-0.31***
	(0.03)	(0.03)	(0.04)	(0.09)
REL Math	0.05	0.05	0.03	0.02
	(0.04)	(0.03)	(0.03)	(0.03)
ES	-0.04	-0.06	-0.05	-0.09
	(0.09)	(0.08)	(0.05)	(0.05)
MS	0.05	0.06	0.04	0.04
	(0.04)	(0.04)	(0.04)	(0.04)

Note: Results are excerpted from full tables of results available in Appendix B
Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Results presented in Table 34 show little evidence that being in a singleton classroom has an effect on ELA or math achievement after controlling for non-random sorting of students into schools and classrooms. One exception is a negative and significant effect of being in singleton classrooms and ELA achievement for RELs in elementary schools.

Of note is that the estimated effect of being in a singleton classroom on REL ELA achievement in elementary school is significant and negative, even after including both a school and student fixed effect. Significant relationships obtained using a school fixed effect of OLS suggest a positive relationship between being in a singleton classroom and achievement. This discrepancy highlights the importance of mitigating the threat of omitted variable bias by using fixed effects when estimating relationships between variables.

Table 32 ***Estimated Effect of Singleton Classes, All Samples***

Effect of Singleton	Sch/St FE	Student FE	School FE	OLS
CELs ELA	-0.01	0.00	0.05***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
ES	-0.02	-0.02	0.02*	0.02
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.00	0.03**	0.08***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)
REL ELA	-0.01	-0.01	0.01	0.01*
	(0.01)	(0.01)	(0.01)	(0.01)
ES	-0.02*	-0.03**	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.00	0.01	0.01	0.01*
	(0.01)	(0.01)	(0.01)	(0.01)
CEL Math	0.00	0.01*	0.05***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)
ES	0.03	0.03*	0.05***	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
MS	-0.01	0.01	0.04***	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
REL Math	0.00	0.01*	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
ES	0.00	0.01	0.04***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
MS	0.00	0.00	0.02*	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)

Note: Results are excerpted from full tables of results available in Appendix B
Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Interaction results. Table 35 shows results of the school/student fixed effect models that include interactions of the two treatment variables (levels of exposure and teacher training) estimated across the ELA and math pooled samples. These interactions allow investigation of the hypothesis that the impact of exposure on achievement depends on the presence of a credentialed or experienced ESL teacher. Results presented in the previous sections showed no evidence of an impact of being in a segregated or singleton classroom on math or ELA achievement, except in the case of elementary school RELS. The question explored in this section is whether the estimated effect is different if a student has a teacher with either an ESL credential or El experience.

The coefficients on the *Segregated* or *Singleton* variables show the estimated effects of a student being in either a segregated or singleton classroom with neither and ESL credentialed or El experienced teacher. The coefficients on the ESL Credential or El experienced teacher variables show the estimated effect of a student having a teacher with those characteristics who is enrolled in a mainstream class (i.e., neither a segregated nor singleton class). Finally, the coefficients on the interaction terms indicate whether there is a differential relationship between being in a segregated or singleton class and achievement conditional on whether students are taught by either an ESL credentialed or El certified teacher.

Results indicate that there is a positive effect of being in a segregated math classroom for CELs who are taught by a teacher *without* an ESL credential, when controlling for both non-random sorting into classrooms and schools. CELs in elementary school who are in segregated math classes taught by an ESL credentialed teacher perform significantly worse in math than their peers taught by an non- ESL credentialed teacher.

Table 33 ***Results of Regression with Interactions, CELs, St/Sch FE, Pooled Samples***

	CEL		REL	
	ELA	Math	ELA	Math
Segregated	0.04	0.09*	-0.04	0.10
	(0.02)	(0.04)	(0.05)	(0.07)
Singleton	-0.01	0.01	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.03	-0.01	-0.01	0.01
	(0.01)	(0.02)	(0.01)	(0.02)
El Exp	0.03***	0.03***	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Segregated*ESL Cert	0.03	-0.07	-0.05	0.06
	(0.03)	(0.06)	(0.08)	(0.13)
Singleton*ESL Cert	-0.06	0.11	0.07	0.00
	(0.06)	(0.12)	(0.04)	(0.07)
Segregated*El Exp	-0.06**	-0.13**	0.00	-0.08
	(0.02)	(0.04)	(0.06)	(0.08)
Singleton*El Exp	0.01	-0.01	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.99***	1.90	0.54***	0.84***
	(0.24)	(1.31)	(0.14)	(0.14)
R^2	0.40	0.37	0.40	0.31
F	657.18	.	.	.
Observations	147913.00	157585.00	119089.00	119589.00

Note: Results are excerpted from full tables of results available in Appendix B
Standard errors in parentheses, * p<0.05, ** p<0.01, *** p<0.001

Results disaggregated by school level suggest that when middle school CELs switch from a mainstream math class to a segregated math class their achievement improves, regardless of whether their teacher has an ESL credential. For elementary school CELs, switching to a segregated math class also conveys a positive benefit, but to a lesser extent. While these findings may not generalize to the entire population of Els, it is important because it shows that learning in a segregated setting can be positive for CELs, especially when they are in elementary school.

There is evidence of a differential effect on ELA and math achievement for CELs in classrooms conditional on whether they are taught by an El experienced teacher. CELs in segregated elementary school classrooms with an El experienced teacher perform significantly worse in both math and ELA than their peers in segregated classrooms taught by a teacher without El experience.

An important finding relates to the impact of teacher characteristics on the achievement of students in mainstream classrooms, who comprise over 75% of the El population. The evidence suggests that for these students there is a significant positive impact of having an El experienced teacher on both the math and ELA achievement of RELs and CELs in elementary and middle school. There is no evidence that Els in mainstream classrooms taught by credentialed teachers perform differently than those taught by un-credentialed teachers

Results Summary

Below I list the most salient results from this study organized around each research question. I discuss results and suggest implications in Chapter 5.

Research question 1: Segregation.

- Els are mostly integrated with their NES peers. This is likely due to their small population rather than explicit efforts on the part of schools.
- CELs tend to be less exposed to NES than RELs.
- Els are more likely to be segregated within schools than across schools
- El exposure decreases in schools with larger El populations and has been decreasing over time.
- The distribution of RELs within schools is becoming more uneven over time. The distribution of CELs between schools is becoming more uneven over time.

Research question 2: Access to trained teachers.

- Less than 5% of Els are taught by teachers who hold an ESL credential.

- The proportion of teachers who hold an ESL credential has not increased substantially over time.
- More than half of Els are taught by teachers who taught at least 2 Els in the previous year.
- There is evidence that Els are systematically assigned teachers with an ESL credential or El experience.
- More than half of CELs in segregated classrooms are taught by an ESL credentialed teacher.
- Els are more likely to have an ESL credentialed teacher but less likely to have an El experienced teacher when they move from elementary to middle school.

Research question 3: Achievement.

- There is evidence of sorting into singleton and segregated classes. Lowest achievers are sorted into segregated classes and highest achievers are sorted into singleton classes.
- There is evidence that ESL credentialed teachers are assigned lower achieving students.
- For most Els, there is not a strong relationship between being in a segregated or singleton classroom and achievement.
- Els taught by an El experienced teacher perform better than their peers who are taught by an El in-experienced teacher. There is little evidence that being taught by an ESL credentialed teacher has an effect on El achievement.

CHAPTER V

DISCUSSION AND IMPLICATIONS

The purpose of this study was to document several key characteristics of the average El's classroom and explore how these characteristics are related to achievement. In particular, this study revealed the extent to which Els are segregated from NESs and the extent to which Els are taught by credentialed or experienced teachers. An important aspect of this study was also to highlight the current school landscape related to Els in North Carolina, one new immigrant destination. I begin this section with a reminder of the motivation driving this study as well as the methods used in addressing each research question. I follow with a summary and discussion of the results of each research question. Next I address the strengths and limitations of the study. I conclude by explaining the implications for research, policy, and practice.

Summary of Motivation and Methods

Els are an increasingly prevalent population in schools across the U.S. In North Carolina, a new immigrant destination, the population of these students has increased nearly 400% since 1990 (Pandya, et al., 2011). On average, Els perform worse on academic achievement tests compared to their native English-speaking peers and schools have struggled to help Els overcome this achievement gap (Batalova, et al., 2007).

In general, Els depend to a great extent on the school to learn academic English, a necessary prerequisite for academic success. The extent to which Els learn English and succeed academically is influenced by the quality of their teachers. Research shows that teachers need specific knowledge and skills to help Els learn English and academic content at the same time (Tellez & Waxman, 2008; Webster & Valeo, 2011). However, there is considerable evidence that teachers equipped with this knowledge and these skills are in short supply (Wainer, 2006), and even those teachers who have received some training in how to teach Els do not feel adequately prepared to support the learning needs of these students (Gandara, 2005). At a more basic level, there is little research documenting the characteristics of the teachers who work with Els.

Evidence is also growing indicating that Els are segregated by linguistic proficiency, race, and socioeconomic status at the school level in some areas of the country (Faltis & Arias, 2007; Whittenberg, 2011). Segregation of minority and low-income students from White and more affluent students has repeatedly been found to curtail opportunities for the former groups (Orfield & Lee, 2005; Faltis & Arias, 2007). Importantly, students in segregated settings tend to have less access to high quality teachers and other important school resources (Vigdor & Ludwig, 2008). However, the literature on segregation is limited in that it tends to focus on the segregation of students at the school level, is based on research conducted primarily in urban areas, and emphasizes segregation of minority and low-income students from White and more affluent students.

To address existing gaps in the literature I asked three sets of questions:

1. To what extent are Els segregated from native English speakers within their math and language arts classes?
    a. How does segregation vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles?

2. How frequently are Els taught by an ESL credentialed or El experienced teacher in their math and language arts classes?
    a. How does access vary over time, by urbanicity, by school level, across schools with different proportions of Els, and across schools with different immigrant growth profiles?
3. How does the classroom context of reception impact student achievement?
    a. Does the degree of classroom segregation impact El achievement on standardized tests of math and language arts?
    b. Does being taught by an ESL credentialed or El experienced teacher impact El achievement on standardized tests of math and language arts?
    c. Does the effect of being in a segregated class differ for students who are or are not taught by an ESL credentialed or El experienced teacher?

I explore these questions using state administrative data provided by the North Carolina Department of Public Instruction. This dataset, which spans the years 2004-2013, contains detailed information on all of the students, teachers, and schools in North Carolina and allows me to match students to their teachers and classmates.

I use descriptive analysis to address the first two sets of questions. First, I investigate the extent to which Els are segregated from NESs using two measures of segregation: evenness and exposure. Then I describe the extent to which Els have access to credentialed or El-experienced teachers. I compare the means and standard deviations of both sets of variables across school level, urbanicity, schools with high, medium, and low El populations, schools with different immigrant growth profiles, and across time.

To address the third set of research questions I use OLS regression and regression with school and student fixed effects. The fixed-effects estimation strategy controls for unobserved variables related to assignment of students to schools or classrooms that may contribute to omitted variable bias. Including fixed effects reduces bias in the estimates of the impact of the treatment variables on El achievement but limits the samples in ways that may reduce generalizability.

Summary and Discussion of Results

Research question 1: Segregation of Els from NESs. In answer to the first research question, CELs and RELs are typically in classrooms where they are the minority and NESs make up the majority. In fact, a sizable proportion of Els are in singleton classes, meaning they have no peers who are also learning English or were formerly learning English.

That being said, there is a small and growing population of CELs in segregated classrooms. The number of CELs in classrooms where there are no NESs has more than doubled since 2006-2007, the first year of this study, from 1.8% to 4.3%. These segregated settings are remedial or specialized classes, albeit not necessarily designed specifically for Els. The majority of middle school Els in segregated classrooms are long-term CELs (Figure 20) and so might be placed in these classes to receive remedial language or academic support. There is little evidence that these settings had a negative or positive effect on achievement, but descriptive results showed that the average peer achievement in these classes was substantially lower than found in mainstream or singleton classes. It is likely then that middle school Els are being tracked into remedial classes, which research suggests are less rigorous, more focused on behavior than academics, and provide less opportunity to learn than general or high track classes (Oakes, 2005).

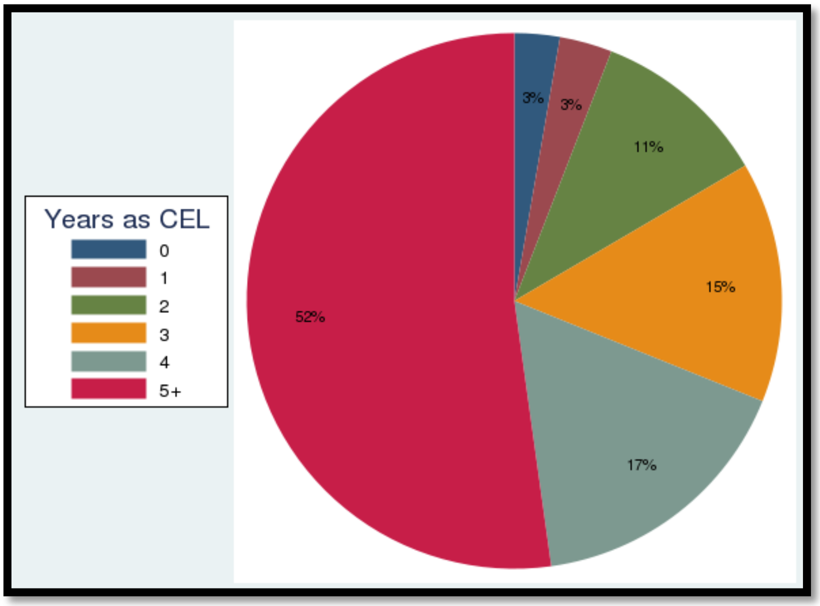

Figure 20. **Pie chart showing average years as CEL for middle school students in segregated classes.**

This study also unearthed important differences in the experiences of the El population in North Carolina compared to those of other subgroups. Compared to their Black, Latino, and low-income peers, Els tend to experience less total segregation in terms of unevenness and exposure. Notably, this study established that Els are more exposed to NESs than racial minorities are exposed to Whites. Evidence from this study suggests that one reason Els are highly exposed to NESs is because they are a small proportion of the student population in most schools. Over the course of the study (2006-2007 to 2012-13), and in schools with greater proportions of Els, however, these students are less exposed to NESs. Thus, exposure appears to be a function of population size and years spent as a CEL instead of concerted efforts to integrate Els and NESs.

This study also found that Els are more likely to be segregated within schools than across schools, which is the opposite of what occurs for other racial/ethnic/income groups. This is important, for while Els may not live in segregated neighborhoods to the same extent as racial/ethnic minorities, when they enter school they are systematically placed into classes where they have a greater likelihood than NESs to learn alongside El peers. Conger (2005) found the same pattern of within- and between-school unevenness of foreign-born students (not necessarily Els) in her analysis of New York City public schools and speculates that higher within-school unevenness is a result of foreign-born students being grouped together for pedagogical purposes. While the data used in this study cannot confirm whether this is the case for Els in North Carolina, the evidence does suggest that CELs in middle school are concentrated in classes for remediation. Importantly, it does not seem to be the case that these classes are designed to help Els acquire English, but rather are classes where students receive remediation in math or ELA. Future research will have to investigate whether placing CELs in remedial classes is related to their ability to acquire English and ultimately reclassify.

There are few sizable differences in segregation based on urbanicity or immigrant growth. However, an examination of segregation by county level shows that there are geographical pockets within North Carolina where Els are substantially more likely to experience segregation, either in terms of exposure or unevenness, than their peers in other areas. The two maps below show the percentage of students in segregated classrooms as well as within-school unevenness of CELs in each North Carolina school district. The maps make clear that students are likely to be more segregated, in terms of exposure and unevenness, in the area around Chapel Hill and Durham, in the Charlotte-Mecklenburg area, and in a cluster of counties in north-central North Carolina (Vance, Warren, and Halifax counties). It is also evident that there are school districts that do not practice segregating Els into distinct classes, as indicated by the yellow areas in Figure 21. It could be that these districts do not have sufficient

Els to justify tracking them into segregated classrooms. On average, districts that have at least one school with a segregated class have about 3,100 Els, while those who do not average about 300 Els. Similarly, the proportion of Els in schools with segregated classrooms is about 15%, compared to about 9% for schools without segregated classrooms. Further, schools may not have the teacher capacity, in terms of ESL credentialed teachers, to create a segregated classroom: on average, schools that have segregated classes have many more ESL credentialed teachers (about 17) compared to those that do not (about 2)

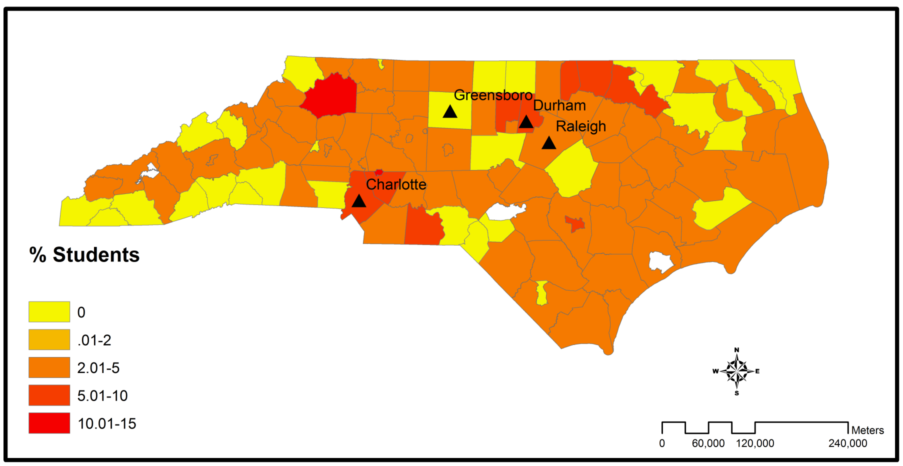

***Figure 21*. Percent of Els in segregated classrooms by school district.**

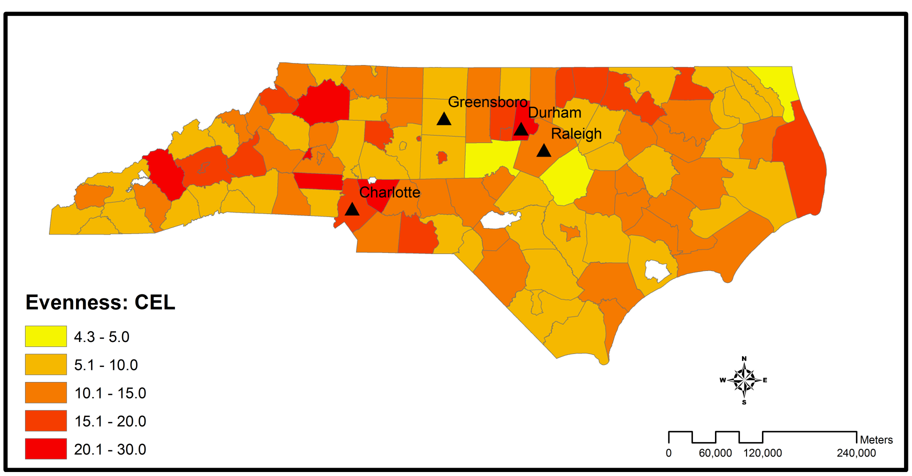

***Figure 22.* Within-school unevenness of CELs.**

Finally, the descriptive evidence suggests that Els have become more segregated from NESs over time. Likewise, a recent study shows a steady increase in the segregation of Black and Latino students from White students in North Carolina schools over time, which has been exacerbated by the end of court-ordered desegregation measures (Ayscue, et al., 2014). While most Els are still very integrated within their schools, the steady increase in within-school unevenness coupled with decreasing exposure to NESs portends a future for Els in North Carolina that may be more similar to the more highly segregated schooling experiences of Els in other areas (Whittenberg, 2011) or the more prevalent segregation of students based on their race or ethnicity (Kucsera & Orfield, 2014).

Research question 2: Access to credentialed or experienced teachers. The second research question was an attempt to understand who is teaching Els, and specifically, to what extent these teachers were credentialed or had El teaching experience. The biggest take-away is that hardly any Els have access to an ESL credentialed teacher. Indeed, in 2012-13 there was only one ESL credentialed teacher for every 250 Els. Further, 37 of 115 school districts did not employ any ESL credentialed teachers. On average, these 37 counties each enrolled about 420 Els. Sampson County, which has seen one of the fastest growth rates in the El population, has no credentialed El teachers for a population of more than 3,300 Els.

At the same time there is evidence that teachers with either an ESL credential or El experience are being matched with Els, and CELs in particular. The descriptive evidence above showed that Els, and CELs in particular, are more likely to be taught be an ESL credentialed teacher or El experienced teacher than their NES peers in both middle and elementary school.

Previous research has found that in California, the state with the largest El population, teachers report receiving the majority of their training on techniques for differentiating instruction for English learners on the job (Gandara, et al., 2003). The results in this section suggest that there may be a group of teachers who are assigned to work with Els even though they do not have an ESL credential. While these data cannot determine the in-service professional development teachers receive regarding how to teach Els, it is probable that teachers who have experience working with Els are also the most likely to receive additional training about how to work with these students.

In terms of other indicators of teacher quality, such as total experience and average pre-service test scores, differences between the teachers of Els and NESs are minimal. However, this study shows that geography and school contexts are related to indicators of teacher quality. This study found that teachers in suburban schools have much higher average pre-service test scores than those in urban settings, and teachers in schools with a high concentration of Els tend to have less experience than those in schools with a low concentration of Els. Importantly though, the differences impact Els and NESs similarly, suggesting that differential access to high quality teachers is driven by between school, and not within school, sorting of teachers. That is, as found in previous literature, teachers with higher test scores and more experience select into schools with a smaller minority population and those located outside of urban settings (Loeb & Béteille, 2008)

Another important result concerns how the transition to middle school impacts CELs' access to credentialed and experienced teachers and their classroom context. About 9% of CELs have an ESL credentialed teacher in middle school, which is about three times as many as have an ESL credentialed teacher in elementary school. At the same time, 7% fewer CELs are instructed by an El experienced teacher in their middle school ELA classes than in their elementary school ELA classes. Combined with the findings presented earlier, which traced changes in the classroom composition experienced by RELs and CELs as they move to middle school, it is clear that the educational trajectories of these two groups of students bifurcate after elementary school. Els who have not reached proficiency in English by the end of elementary school are assigned to classes with peers who are achieving on average about a third of a standard deviation lower than the peers of RELs, are less likely than the classes of RELs to be advanced and more likely to be remedial. On the contrary, Els who enter middle school proficient in English largely join the mainstream path of their NES peers. They are assigned to teachers with an ESL credential at almost the same rate as their NES peers and are not enrolled in specialized ESL classes. They are as likely as NESs to be identified as gifted and are in classes where the average peer achievement is only about .06 standard deviations lower than NESs. The achievement gap between RELs and CELs that is evident in both ELA and math scores is likely exacerbated by these divergent settings.

Research question 3: The relationship between segregation, ESL teacher training, and El achievement. Descriptive results indicate that there are substantial differences in the personal, classroom, and school characteristics of current and reclassified Els. Most important is the dramatic difference in achievement between the two groups. It is unclear when this achievement gap begins because achievement data is not available for Els before 3rd grade, and comparing the two groups is complicated by the changing status of students. However, when CELs enter middle school, they begin to be tracked into classes with other lower achieving students according to their prior low achievement, reducing their likelihood of academic success. To illustrate, figure 23 shows the diverging trajectories of Els who were in 4th grade in 2008-2009. The top line represents the average peer achievement of students who had already reclassified before 4th grade. These students are assigned to classes with peers who score about average in ELA in elementary school and above average after they reach middle school. The next line, labeled *Reclassify after 4th*, are students who were CELs in 4th grade, but reclassified before 8th grade. These students' peers score below average in elementary school and middle school, but after an initial dip when students enter middle school, peer achievement remains relatively stable. The third line, labeled CELs, are students who were CELs in 4th grade and did not reclassify by the time they left 8th grade. The average achievement of their peers decreases with each grade. There is a clear increase in the achievement gap between students who reclassify before 4th grade or before 8th grade, and those who do not reclassify before 8th.

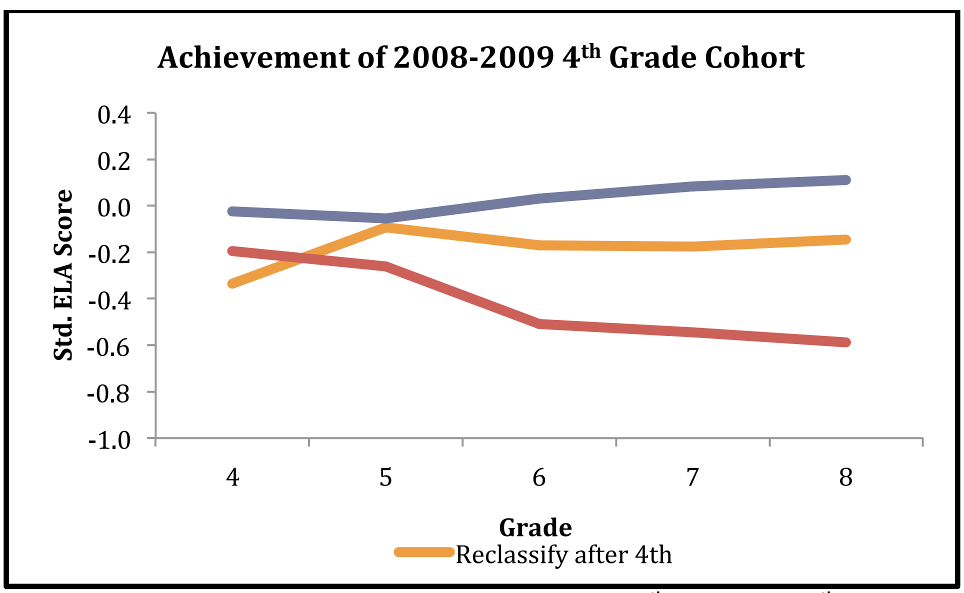

Figure 23. **Peer achievement for students who reclassified before 4th grade, after 4th grade, or who had not reclassified by 8th grade.**

Hypothesis 1. Overall, there is little evidence that being taught by a teacher with an ESL credential has any effect on El achievement. Effects detected using OLS and school fixed effects indicate that being taught by an ESL credentialed teacher has a negative impact on achievement, particularly for CELs in middle school. This is an important result because middle school CELs are typically long-term Els who are most at-risk of academic failure. However, these results likely suffer from bias caused by omitted student level variables. For instance, it could be that all newcomers are assigned credentialed teachers and these students tend to perform worse than second or third generation Els.

There are several reasons that potentially explain why obtaining an ESL credential does not make a teacher more effective with Els. First, the skills and knowledge needed to earn a credential are different than the skills and knowledge needed to be an effective ESL teacher. In North Carolina, teachers must demonstrate knowledge of “Linguistics and Language learning; Planning, Implementing, and Managing Instruction; Assessment; and Cultural and Professional aspects of the Job” (ETS, 2014) in order to pass the requisite Praxis II TESOL exam, which is the only requirement for obtaining an ESL credential. While these categories align with what research suggests ESL teachers should know (Tellez & Waxman, 2006; Villegas & Lucas, 2011), perhaps teachers in North Carolina, who typically teach Els in mainstream settings and in schools with a relatively small El populations, need additional knowledge in how to differentiate instruction to address multiple levels of proficiency in reading, writing, listening and speaking, how to work with immigrant parents, or how to teach content and language in tandem.

Another possibility is that teachers who obtain a credential are assigned students who are more “difficult to teach”; e.g. they have lower average achievement or are less proficient in

English. The findings above suggest that this is likely the case. ESL credentialed teachers teach Els whose average achievement and prior year achievement is about .4 standard deviation lower than the Els who are taught by teachers without an ESL credential. Additionally, ESL credentialed teachers teach Els who are on average more likely to be CELs, are absent from school more frequently, are more mobile, are more likely to be eligible for free and reduced price lunch, have been learning English for more years, and are more likely to be living in an urban environment. The skills and knowledge teachers learn through the credentialing process may not be sufficient to make a teacher more effective with this group of students. The findings from this study support this hypothesis: when controlling for non-random sorting of students into classroom using student fixed effects, the significant negative relationship between a teacher having an ESL credential and ELA achievement observed fro CELs decreases in magnitude and becomes insignificant (although differences might be due to changes in the sample, as discussed in the sensitivity analyses presented in Appendix C).

Next, teachers who receive ESL credentials might not be effective because they are different than those who do not in ways that are negatively related to student achievement. The evidence shown in this study does not strongly support this supposition: ESL credentialed teachers have only slightly less experience than their peers without an ESL credential, they have higher average test scores, and they are just as likely to be a new teacher. These characteristics are controlled for in the models used in this study, but there are potential unobserved characteristics that might differentiate ESL credentialed or non-credentialed teachers. Perhaps, as shown in some literature (Batt, 2008; Durgunoğlu & Hughes, 2010), ESL credentialed teachers feel that they are not fully supported by their peers or administrators and the perceived lack of support is related to decreased effectiveness.

Finally, teachers with an ESL credential might not be effective because they work in schools that are different than those of teachers without ESL credentials and these differences may offset any significant effect having a credential has on achievement. Observable differences between the schools in which ESL certified and uncertified teachers work uncovered in this study include that ESL credentialed teachers tend to work in schools that have about 10% more minority students and about 5% more low income students than the schools in which non-credentialed teachers work. Again, these variables as well as time invariant unobserved characteristics are controlled for in the models used in this study, but unobserved time- varying differences in school characteristics might offset the impact that an ESL credential could have. For instance, perhaps ESL credentialed teachers are more likely to work in schools with higher teacher or principal turnover, a time-varying unobserved variable that is correlated with the proportion of minority and low income students in a school (Loeb & Béteille, 2008) and which research finds is negatively related to student achievement (Ronfeldt, Loeb & Wyckoff, 2013).

While this study found little evidence that ESL credentialed teachers were more effective than non-credentialed teachers, it did uncover substantial evidence that being taught by a teacher with El experience has a significant and positive effect on the ELA and math achievement of both El subgroups, and these effects are robust to changes in the threshold used to indicate experience (see sensitivity results in Appendix C). In almost all cases, the effect of being taught by an El experienced teacher on achievement is detected using student and student/school fixed effects. These results are least likely to be biased due to an omitted variable, but the positive effect of having an El experienced teacher may not generalize to the overall El population.

The positive relationship between being taught by an El experienced teacher and achievement corroborates previous research conducted with both Els and NES students. Total years of experience is one of the few teacher characteristics that researchers generally agree is positively associated with student achievement (Clotfelter, 2010; Harris & Sass, 2011; Henry, Bastian, & Fortner, 2011; Steiger & Rockoff, 2010). Further, recent research related to Els found that specific experience with Els was related to increased El achievement (Master et al., 2012).

Importantly, it is not as evident that El experienced teachers are assigned more “difficult to teach” students, are employed in significantly different schools, or have different personal characteristics, as are ESL certified teachers. In fact, El experienced teachers tend to teach students with fewer absences, who are less likely to be eligible for free and reduced price lunch, and who have slightly higher average achievement and prior achievement.

Hypothesis 2. To address the second hypothesis, I test whether there is a relationship between being in a segregated or singleton classroom and achievement, and then test whether that relationship varies according to whether the teacher has an ESL credential or El experience. Estimates from models using school fixed effects show that being in a segregated classroom has a negative effect on achievement in math and ELA for CELs as well as some evidence that being in a singleton classroom has a positive impact on the achievement of both CELs and RELs, particularly when they are in middle school. However, for the most part significant results are not robust to models with student and school fixed effects, indicating that non-random sorting of students into classrooms or schools may bias results.

The student fixed effects model provides an indication of how students fair when they switch in or out of a segregated class. Switching into or out of an ELA class has no significant effect on ELA achievement, although in elementary school the coefficients are in the positive direction. However, the student fixed effects model shows that when middle school CELs switch into a segregated math class, possibly when they move schools, their achievement suffers. One explanation for this result is that in segregated math classes, content knowledge is watered down or sacrificed in order to focus on English language development and so students have less opportunity to learn, and subsequently, lower achievement.

Surprisingly, the evidence suggests that Els in segregated classroom perform worse if they are taught by a teacher with El experience. Given that there is relatively strong evidence that Els perform better when taught by El experienced teachers, these results are rather surprising. The negative interaction between El experience and segregated classroom persists across all models, so the explanation is not that the student/school fixed effects sample is peculiar in some way. One potential explanation is that while the teachers in segregated settings have experience teaching Els in the previous year, they do not have experience teaching a segregated class of Els and so their experience does not confer a positive benefit. Another possibility is that segregated classrooms enroll more newcomer students, and experience with Els in general does not translate into effectiveness with newcomers. The average number of Els in segregated and mainstream classes may also help explain the result. In segregated classes, there is an average of about 7 Els, whereas in mainstream classes there is an average of 3 Els. Recall that the experience variable is defined as having taught 2 Els in the prior year. The mainstream class setting may be more typical for teachers who have this El experience, and so their experience translates into increased effectiveness.

Finally, explanations for this surprising result must take into account the limitations of the El experience variable, which does not indicate how many total years of experience a teacher has with Els, if the Els she has experience working with are CELs or RELs, if she has experience with newcomers or low achieving students, etc. Ultimately, additional research is needed to uncover why Els are placed in segregated classrooms and the mechanism by which El experience impacts El achievement.

Regardless of the complicated scenarios that might explain the results for students in segregated classrooms, the most important take-away concerns students in mainstream classrooms, who comprise more than 80% of the El population. For these students, being taught by a certified teacher does not impact achievement but being taught by an El experienced teacher has a positive benefit. It is significant that RELs benefit by being taught by an El experienced teacher. While these students are deemed English proficient, they may still require support in acquiring academic vocabulary or assimilating into the school culture that an El experienced teacher is capable of providing.

The findings related to Hypothesis 2 also suggest the ways that students are sorted into segregated or singleton classrooms. Results estimated using the school fixed effects model indicate a substantial negative relationship between a CELs being in segregated classes and elementary school ELA and math achievement as well as middle school math achievement. These estimates are based on a comparison of students within schools, but do not account for non-random sorting of students into classrooms. The negative effect washes out when this sort of sorting is controlled for using student fixed effects, suggesting that the lowest achieving CELs are sorted into segregated classrooms based on an unobserved variable. Plausible scenarios are that CELs are assigned to segregated settings because they are newcomers, they are perceived by teachers as "behavior problems", or they have an undiagnosed learning disability.

At the same time, students in singleton classes tend to perform better than those in mainstream classes. Results estimated with the school fixed effects model denote that within schools, Els who are enrolled in singleton classes are higher achieving than those in mainstream classes (except for RELs in singleton ELA classes). This significant and positive relationship disappears when combining the student and school fixed effect, indicating that there may be non-random sorting of Els into singleton classes (assuming differences in the samples used for estimation are not driving differential results). It could be that the students who are perceived to have the highest aptitude are assigned to singleton classrooms.

Contributions and Limitations

One of the greatest strengths of this study is that it utilizes a statewide longitudinal dataset that links students to teachers. This dataset is ideal in that it offers the opportunity to identify how classroom and school contexts change for every El enrolled in grades 3-8 over five years, and to model whether differences in these classroom environments have any bearing on future achievement. The sheer number of observations in each year allows for the detection of subtle patterns and relationships, such as how being taught by an El experienced teacher impacts the achievement of students in segregated settings. Further, the dataset includes a rich set of variables and supports the estimation of models that include both student and school fixed effects. Previous research has been limited by data constraints. Most research on segregation has been limited to investigations of segregation between schools or segregation in a particular district. Furthermore, the literature on school segregation focuses almost exclusively on race and income-based segregation, rather than examining segregation in the context of language proficiency status. The few studies that do investigate within-school segregation do not highlight how Els are segregated from NESs. This study is the first to study both within-school segregation and how segregation impacts Els.

On the other hand, research related to teachers' effectiveness has utilized similar statewide longitudinal data sets. However, this study contributes to the literature on teacher effectiveness by shedding light on an understudied population of teachers: those of Els. There are few if any studies that detail the characteristics of the teacher labor force for Els across an entire state, as this study does. Additionally, this study broadens the nascent research related to the effectiveness of teachers of Els.

A third strength of this study is that it uncovers how Els are being educated outside of traditional destinations. Research based in Texas and California—and, to a lesser extent, Florida and New York—dominate our understanding of the school experiences of Els. Studies conducted in other areas of the country are typically limited to investigations of particular schools or districts and so have limited generalizability. The contribution of my work is in broadening our understanding of how Els are educated in new immigrant destinations. Because this study employs a statewide dataset, it describes the conditions in one such new destination from a comprehensive perspective, such that researchers can begin to discern anomalies from trends. By using the classroom as the unit of analysis, I can simultaneously drill down to the most immediate conditions that impact El achievement while aggregating findings across the whole state.

At the same time, there are important limitations that constrain what can be learned from this study. The most important were discussed in Chapter 3 and in the sensitivity analyses (Appendix C). These limitations include 1) findings based on models using school and student fixed effects are not likely to generalize to the entire population of Els; 2) The threshold used for defining an El experienced teacher is arbitrary; 3) the mobility of the EL population can bias results, and; 4) End-of-Grade assessments do not provide the most valid or reliable indication of an El's academic achievement or ability.

Other limitations emerged throughout the study. For instance, missing data prevented an analysis of whether Els benefited from being taught by teachers who had taken the Praxis TESOL exam or who had received undergraduate or graduate training related to Els. Also, in order to estimate models, each child could only be assigned one teacher or classroom per subject, discounting the effect that other teachers or classmates have on the achievement of that student. Next, data is most reliable for students after they reach 3rd grade. In many cases it is unclear when Els enroll in school or at in what grade they had reclassified, if they reclassified before 3rd grade. Because I can only track students beginning in 3rd grade, there may be important achievement trends and/or class factors that explain the differential achievement of CELs and RELs evident in upper elementary and middle school that I can not address or control for. While these constraints limit the validity and reliability of the findings from this study, they also suggest areas where future researchers should collect more and better data and lay a path for further inquiry.

Implications for Research

The current study addressed a limited number of important class characteristics that are important to the academic success of Els and uncovered many more areas that should be addressed by future researchers. Below I list several specific questions that emerged through the research process and should be answered to better understand how Els experience school.

Why are some Els in segregated settings? There is no explicit policy in North Carolina that encourages schools to segregate Els; in fact, only a small minority of Els are in segregated classrooms. Schools are free to implement any method for teaching Els that they believe is most appropriate, including “pull-out” programs where Els are segregated from NES peers. As such, 622 schools have at least one segregated class and over 8,000 students have been taught in segregated math or ELA settings over the last 5 years.

What is not clear is why some schools choose to place Els in these settings and why, within particular schools, some students are in segregated settings while others are not. The evidence does not clearly indicate that Els are in these classrooms for pedagogical purposes. About 80% of segregated classes are not identified as specifically for Els and about half of the teachers of segregated classes are not identified as having ESL credentials. At the same time, segregated classrooms are about half the size of other classrooms and tend to have students who are low achieving. The most plausible conclusion is that Els are not being segregated because of language proficiency, but, on the contrary, are being tracked into less rigorous classes based on prior achievement or a perceived deficit. Future research would do well to disentangle the effects of language proficiency versus academic achievement as antecedents that influence the decisions to segregate. Similarly, future research will need to observe classrooms, interview educators, and collect more detailed information about the classes that enroll ELs to uncover why some Els are taught in segregated settings.

What is the experience of Els in singleton classrooms? The experience of Els in singleton classrooms deserves more attention. While not segregated from NESs, Els in singleton classes are isolated from other students who share their language learning experience and, more likely than not, their cultural background as well. Their achievement does not seem to suffer, but earlier qualitative research suggests that when there are few Els in a classroom, they may be ignored by teachers or their needs may not be fully addressed (Durgunoğlu & Hughes, 2010). Future work should investigate how Els are supported by teachers, how Els interact with their NES peers in these classrooms, why students are placed in these classrooms, and how being in a singleton class impacts non-academic outcomes such as self-esteem, identity development, sense of belonging, etc.

What is the experience of Els in high school? Due to data limitations, this study was only able to address the experiences of Els in elementary and middle school. The results indicated that the experiences of CELs and RELs diverge in middle school, and it is likely that future research will reveal even larger differences in high school. In addition to documenting how classroom context differs between RELs and CELs when they are in high school, future research should also investigate how the findings shown in this study translate into important high school outcomes, like dropout rate and high school End of Course scores. For example, future research could predict the likelihood of graduating high school based on whether a student was placed in a segregated classroom in middle school or whether a student had access to an El experienced teacher each year.

How is El experience related to El achievement? In the absence of a large supply of teachers with an ESL credential, school leaders are likely using other indicators, like El experience, to make strategic decisions about how to assign Els to teachers. While these teachers by and large have not had pre-service training in how to support Els, it is likely that they are receiving on the job training from the school, district, etc. Even without formal training, teaching an El over the course of a year gives a teacher hands-on experience that will likely help him or her support Els in the following school year. Scholars should further investigate this relationship between El experience and El achievement. Does some experience, such as experience with current Els rather than reclassified Els, matter more than others? Does El experience increase effectiveness for teachers at all stages of their career? Is it experience per se or additional training that is increasing teacher effectiveness?

Additionally, it will be important to investigate how multiple years of experience working with Els impacts achievement. In this study, experience measures if teachers worked with 2 Els in the previous year, but not how the cumulative effect of many years of experience is related El achievement. Literature related to the impacts of total years of experience on student achievement has found that the effect of experience is greatest when teachers are in their first five years of teaching, after which the return to each additional year of experience decreases (Henry, Bastian, & Fortner, 2011; Kane, et al, 2008). It could be that the same trend arises with El experience: that in the first few years of working with Els, teachers see larger gains in effectiveness, but that those gains level off over time. These lines of inquiry are important because an increasing proportion of teachers will experience working with Els over time, and there is strong evidence that experience with Els has a positive impact on achievement.

What factors make Els feel welcomed in school? Because each student experiences school differently, it is important that future work examine “welcoming contexts of reception” from the student’s perspective (Montero, et al., 2012; Murphy & Torre, forthcoming). Individual students in the same school might experience varying degrees of “welcoming” depending on their language proficiency, racial background, or cultural characteristics. For example, Schwartz and his colleagues (2014) identify factors related to adolescents’ perceived context of reception. Significant factors included items such as “I believe that I have the same opportunities as other immigrants coming into this country” and “Teachers treat kids from my country differently than kids from other countries” (p. 6). The authors found a significant correlation between adolescents’ perception of a negative context of reception and symptoms of depression. All in all, while my study succeeded in quantifying key relationships among El achievement and various teacher and classroom characteristics, we would be remiss not to examine the social and emotional wellbeing of El students in a more qualitative manner than was attempted in this study. Future work should continue to probe how students define a welcoming context, how educators can improve perceptions of being in a welcoming context, and whether perceptions of a negative or positive context of reception are correlated with academic outcomes.

Implications for Policy And Practice

Strengthen the ESL credentialing process. As discussed above, an important finding from this study is that teachers who have earned an ESL credential are not more effective at increasing the ELA or math achievement of CELs or RELs compared to teachers who have not, regardless of whether the teacher is teaching a segregated, mainstream, or singleton class. The evidence from this study suggests two main drivers for this result: 1) the knowledge needed to pass the credentialing exam is not aligned with the knowledge needed to increase El achievement and/or 2) ESL credentialed teachers are assigned students who are more challenging to teach than non ESL credentialed teachers.

One strategy to address the first potential driver is for North Carolina to create and administer its own certification exam that focuses on the needs of Els in the North Carolina context instead of relying on the standardized Praxis exam meant to assess teachers across all contexts. This assessment should focus on the needs of teachers of Els in new immigrant destinations. First, considering that most elementary and middle school Els are taught in mainstream content area classes, there should be special attention to assessing teachers' capacity to teach Els in a mainstream setting. Next, prior research reports that schools in new destinations typically have not developed structures or adopted curricula specifically designed to support Els (Bohon, et al, 2006; Fix, et al, 2005) and so teachers in new destinations might need more robust training than those in traditional destinations regarding how to select or develop appropriate instructional materials. A state created credentialing exam should assess teachers' ability to adapt curricular material for Els.

Also, previous literature has reported that teachers in areas with relatively small El populations or in rural areas may not have much experience working with immigrant students or students with diverse cultural backgrounds (Batt 2008; Bohon, et al, 2006) and might harbor negative feelings towards immigrant students and their families (Walker, et al., 2004). This research is relevant because in North Carolina 44% of teachers work in rural areas and 25% of teachers work in low incidence schools (i.e. schools that enroll less than 10% Els). Thus a North Carolina specific credentialing exam should emphasize cultural competency, that is, the ability to understand the diverse backgrounds of students, understand how background shapes the learning process, as well as understand how to interact and collaborate with culturally and linguistically diverse students, parents, and stakeholders (Nieto, 1999; Wilson, 2014).

Another policy solution for strengthening the credentialing process in North Carolina is to require that teachers do more than simply pass a test in order to become certified. For instance, teachers in Washington State, where Els make up about 10% of the student population compared to 7% in North Carolina (Soto, Hooker, & Batalova, 2015), must either have completed a university program focused on teaching ESL or on teaching Bilingual education in addition to passing a Washington state specific credentialing exam to receive a credential. Further, the university-based programs are required to have a fieldwork component. A similar requirement for teachers in North Carolina to complete fieldwork before they are credentialed might be particularly impactful given the results of this study that showed a positive return to El experience. While there is no published evidence that the credentialing process in Washington creates more effective teachers, it at the very least ensures that the teachers of Els have a common understanding of the skills and knowledge needed to support Els.

To address the possibility that ESL credentialed teachers are not more effective than their non-credentialed counterparts because they are assigned more challenging students, policy should be developed to provide additional support to ESL credentialed teachers so that they can effectively translate the knowledge they learn when earning an credential to increased effectiveness in the classroom. ESL credentialed teachers are assigned students who are lower achieving and more likely to be currently learning English. A high concentration of low achieving students in one class might decrease the overall effectiveness of a teacher, regardless of their training. One policy that might support ESL credentialed teachers in addressing the needs of students who have multiple learning needs is to limit to the number of CELs that can be in any particular classroom, or alternatively, provide aids in classrooms that have a high proportion of CELs. In this way teachers have more time to devote to differentiating instruction to meet the academic needs of each student. Providing aids in the classroom who speak the languages spoken by El students can be particularly beneficial in supporting teachers of classes that enroll newcomer students (Bennett, 2012; Hill & Flynn, 2004).

The drawback to both of these policy recommendations is that hiring new teachers or new aids is expensive and decreasing class size can have negative repercussions for the teacher labor market (Ladd, 2008). Schools could avoid the added expense of hiring new teachers by re-distributing CELs evenly across all teachers in each grade. While this could mean that fewer CELs would have access to a credentialed teacher, it would also allow more teachers to gain experience working with Els, which could positively impact the achievement of Els in subsequent years.

Alternatively, schools could distribute Els evenly across the non-ESL credentialed teachers and at the same time implement a “push-in” model of ESL instruction, whereby an ESL credentialed teacher co-teaches with 1 or more mainstream content area teachers for all or part of the school day. In a low El concentration school, one ESL credentialed teacher could potentially push-in to all of the classrooms where there is at least one El. Again, decreasing the case-load of the ESL credentialed teacher might allow her to better use the knowledge she learned throughout the credentialing process to support students. One disadvantage to the "push in" model is that it requires considerable collaboration between the content area teacher and the ESL teacher in order to be effective, which in practice can be difficult to achieve given constraints created by time, scheduling, conflicting personalities, and perceived power differentials between mainstream content area teachers and ESL teachers (Bell & Walker, 2012; McClure & Cahnmann-Taylor, 2010). To overcome these obstacles, research suggests that co-teachers volunteer to co-teach, be provided common planning time, and be trained in strategies to productively collaborate (Scruggs, Mastropieri & McDuffie; 2007).

Support Els in Low-Concentration Schools. Another important finding from this study is that while Els are a fast growing population, they remain a small minority in most schools and districts. In about 67% of schools Els make up 10% or less of the school population, or on average less than 50 students. Further, Els comprise less than 10% of the district population in 87% of districts. The relatively small population of ELs has implications for the types of programs districts and schools should implement, the way resources should be allocated to schools and districts, and the way educators should be trained. Three recommendations for how low El concentration schools in North Carolina can address the needs of a small population of Els given limited resources are described below.

Create El literacy. In low incidence schools and districts, educators may not have experience working with culturally diverse families and students. District and school leaders have the responsibility to ensure that teachers and staff are prepared to support Els. A first step is to create EL literacy, that is, ensure that all educators are familiar with the legal requirements related to Els, have high expectations for second language learners, and have some understanding of the knowledge and skills needed to support Els in the mainstream classroom. This basic training can be given by local El coordinators, teacher leaders, or principals within schools during faculty meetings or even provided through online modules. Developing basic El literacy among schools staff is important for promoting asset based views of Els, ensuring that schools are complying with the legal requirements for supporting Els, and equipping all teachers to at the very least have the ability to identify Els, recognize their special educational needs, and seek out additional support as needed.

Additionally, district and school leaders should leverage the expertise and knowledge of El experienced teachers. A little more than a quarter of teachers in low El concentration schools worked with Els in 2012-13, and this study showed that they are more effective than others. They could be tapped by district and school leaders to become teacher-leaders who can help mentor, train, or support other teachers who do not have this experience within particular schools.

Support teachers. In schools with a low El concentration, about 30% of Els are in singleton classrooms. It is possible that in these classrooms the specific language needs of Els are easier to overlook, particularly if Els can communicate orally (de Jong & Harper, 2005). Additionally, this study showed that in 2012-2013 about 75% of teachers in low incidence schools did not have experience teaching at least 2 Els in the previous year. To support inexperienced teachers and teachers who have to differentiate instruction for a single El, schools with a low incidence of Els could develop individualized reports for each El that follows them from year to year until two years after they reclassify (a period in which North Carolina mandates that the academic progress of Els be monitored). This plan would include students' most recent scores on the WIDA English proficiency exam (documenting their proficiency in reading, writing, speaking, and listening). Based on this information, the report could suggest what language domains (i.e. reading, writing, listening and speaking) teachers should target to help Els meet the benchmarks for reclassification as well as strategies that might be most beneficial for strengthening the student's English language skills. This report could also include information about the El, such as where they immigrated from or if they were born in the U.S., the language they speak at home, and whether their parents prefer to speak in English or a different language. This information could help teachers make connections to their students' home cultures and better communicate with parents. Teachers in North Carolina already receive reports detailing each students standardized assessment data, and so the additional information described could simply be added for Els.

Engage with families. A large body of evidence shows that when parents are involved with their children's education within the home, children tend to do better academically (Leithwood et al., 2010; Goldenberg, 2004). While it is important for schools to engage with the parents of all students, it is particularly important for schools to reach out to the parents of Els, who are typically immigrants and likely were not educated in the U.S. (Goldenberg, 2004). Based on their work supporting a district with a small El population in a new immigrant destination, Hill and Flynn (2004) recommend that districts and schools with few Els reach out and recruit the parents of El's to participate in regular parent meetings, where school staff provide information on how students are taught and assessed, parent and students' rights and responsibilities (such as the right to waive ESL services or the right enroll in a public school regardless of documentation status), the expectations teachers have for parents, and resources available in the community to support students and their families. In districts and schools with few Els, there may not be the resources to hire translators, and so schools can recruit community members or parents to provide these services. In the district profiled by Hill and Flynn (2004), community members were recruited as bilingual paraprofessionals not only to support students in the classroom but also to help reach out to parents. Finally, in districts/schools with very few Els, e.g., insufficient Els to warrant organizing ongoing parent meetings, individual teachers or leaders might be designated to work with parents on an individual basis.

Support young Els. Data used for this study shows that about 69% of 8th graders in 2011-12 enrolled in a North Carolina school in pre-K or Kindergarten[15] and the North Carolina DPI reports that 79% of the Els in grades K-5 in 2012-13 were born in the United States. There is a large body of research that suggests that the younger people are when they begin acquiring a second language, the more successful they will be (Birdsong, 1999; Johnson & Newport, 1989; Cook, 2013) and this study found that students who are proficient in English (RELs) are successful academically and even outperform NESs. As well, this study uncovered how the academic experiences of RELs and CELs diverge in middle school, with RELs enrolling in advanced or gifted classes at a higher rate and being assigned to classes with higher achieving peers than their CEL peers.

The implication of these findings combined with prior research is that it is absolutely critical that policy makers leverage the opportunity to help Els become proficient in English

[15] This data is not reported above or use in analyses because it is only available until 2010-11.

while they are young. This will require that state policy makers push for an investment in the early childhood and elementary education of El students so that they can become proficient in English and reclassify as soon as possible. North Carolina is well positioned to begin offering services to Els before they enroll in elementary school. Currently, Els are eligible for North Carolina's state funded pre-K program, regardless of other factors such as their socio-economic status. Research indicates that Latino students, including many Els, are less likely than Black, White, and English speaking students to enroll in a structured pre-K program (Barnett, Carolan, Fitzgerald, & Squires, 2011). Instead, many Latino and Spanish-speaking children are cared for at home or by a relative. Educators and policy makers in North Carolina should make it a priority to reach out to Spanish-speaking and Latino families and ensure that parents are aware of the benefits of pre-K as well as the child care options available in their areas.

Offering pre-K will not improve the academic achievement of Els if pre-K programs are not designed to support Els or are of low quality. Policy makers in North Carolina can look to the four states that mandate early childhood programs for Els - Alaska, Illinois, New York, and Texas - for examples of how to develop early childhood policies that target Els. Some of the specific policies related to early childhood for Els in these states include mandated bilingual pre-K programs in districts with at least 20 Els (Texas), and a requirement that early childhood teachers of Els have a bilingual or ESL credential (Illinois). Research suggests that high quality pre-K programs for Els emphasize conversations between students and teachers, focus on vocabulary development, and provide opportunities for children to develop language and literacy in both English and their native language (Figueras-Daniel & Barnett, 2013).

The foundations laid in pre-K need to be bolstered by strong elementary school ELD programs. In districts that have a large enough population of Els who speak the same language, as well as the requisite teacher capacity, elementary schools can develop bilingual programs, which research has shown can be an effective way to help students learn English while maintaining their native language proficiency (Rolstad, et al., 2005; Slavin & Cheung, 2004). However, for the majority of schools in North Carolina where bilingual programs are not feasible, the priority should be to train teachers in how to provide sheltered English instruction in the earliest grades to support Els. Again, given the evidence that the academic trajectories of RELs and CELs become increasingly disparate as students progress through school, it is important to create policy intended to help Els reclassify before they reach middle school.

Distribute Els to teachers equitably. The evidence from this study suggest that Els are assigned to segregated or singleton classrooms based on achievement: the lowest achieving Els are more likely to be in segregated classes and the highest achieving Els are more likely to be in singleton classes. However, there is little evidence that these grouping practices have a positive effect on achievement, and some evidence that they have a negative impact on achievement.

Given these results, it is best to default to integration rather than segregation when possible to avoid marginalizing or out-casting particular students, or possibly hindering academic achievement. The findings above suggest that when CELs are assigned to mainstream, integrated classrooms, they are typically assigned to classes with low achieving peers. Ideally, CELs shuold be assigned to classes where peer achievement reflects the average achievement of the peers in each grade to assure that they can benefit from interactions with both high and low achieving peers. However, results from this study suggest that CELs perform the same or better in mainstream or singleton classes. As such, it is a better option to assign CELs to non-segregated classes, even if those classes are comprised of a disproportionate share of low achieving NES peers. At the very least, in these classes students have access to English language models that may help them acquire social, if not academic, English (Krashen, 1982; Long, 1996).

Assigning Els equitably across all of the teachers in a grade could benefit teachers as well as students. Distributing Els across more teachers would allow more teachers to gain experience teaching these students, which in addition to increasing their effectiveness in teaching future Els, might increase their personal sense of responsibility for the education of Els. One could imagine that teachers with Els in their classrooms would be more invested in seeking out resources or training to improve their capacity to teach these students, and training might be more relevant and impactful if teachers can apply what they learn to their current practice (Croft, et al., 2010).

Nevertheless, given that there is not strong evidence that assigning Els to segregated classes hinders achievement, it may be an appropriate choice if the assignment benefits the student in a different way- if it helps the student acculturate to the school, if it is for bilingual services, if it provides a safer environment for a new student, etc. (Faltis & Arias; 2007; Platt, Harper, & Mendoza, 2003).

Train teachers and principals. Policy should be developed to provide in-depth training to the teachers who work with Els, which this study shows was upwards of half of all teachers in 2012-13. It is imperative that *all* teachers receive at least basic training because more than 90% of Els in North Carolina are educated in mainstream classrooms. Arguably, students in mainstream settings are in a “content-based” ELD program, where English is taught through content. However, this study revealed evidence that the majority of these teachers did not receive any pre-professional training or supplemental training (in the form of a master's degree) to facilitate this sort of instruction.

Teacher preparation programs have an important role to play in providing pre-service teachers requisite knowledge and skills to support Els, who are likely to be a part of their future classes. Currently, the vast majority of teacher preparation programs in North Carolina, which train 35-40% of teachers, do not require teachers to take courses specifically related to instructing Els (Preston, 2015). Thus, what knowledge teachers are receiving in their pre-professional programs is likely sparse and disconnected. Ideally, teacher preparation programs should offer courses or programs of study specifically designed to prepare teachers to teach Els. These courses or programs shuold be offered in tandem with courses required for teachers seeking content-area preparation so that teachers are prepared to work with Els in a mainstream setting. Pre-service programs shuold require a fieldwork component so teachers can accrue experience with Els before entering a classroom. Teachers shuold be assigned to do their fieldwork in mainstream content area classes with students currently learning English, as these are the likely settings in which they will eventually teach Els.

A study of teacher preparation programs in North Carolina found that teachers who had taken courses in teaching students with special needs were more effective at increasing the achievement of Els (Preston, 2015). The likely explanation for this result is that courses designed to prepare teachers to teach special needs students provide teachers with the knowledge and skills to differentiate instruction and adapt existing curricula and assessments for students with diverse learning needs, skills that research also suggests is important for the teachers of Els (Tellez & Waxman, 2008). Teacher preparation programs can model new courses or programs for Els around those designed for special needs students.

While new teacher preparation programs focused on preparing teachers to teach Els can aid future teachers, in-service professional development is needed to train the teachers presently teaching the nearly 100,000 Els who are enrolled in North Carolina public schools. This study suggests that teacher training needs to include some sort of hands on experience. We can presume that the teachers who earned a credential had sufficient training, be it formal or informal, to pass the Praxis TESOL exam. However, this training was insufficient for increasing El achievement in any setting. However, in most settings teachers who had on-the-job training in the form of El experience were shown to be more effective. One way to ensure hands on training is for schools and districts to provide job-embedded and ongoing professional development for teachers, instead of one-off professional development sessions that provide teachers with information disconnected from their particular classrooms. Job-embedded professional development is "hands on" in that it is grounded in a teacher's every day practice and consists of "teachers assessing and finding solutions for authentic and immediate problems of practice as part of a cycle of continuous improvement" (Croft, et al., 2010, pg.2). Job-embedded professional development formats are particularly well suited for training teachers to teach Els because they are designed to cater to the specific needs of a particular locale (Hirsh, 2009). Thus, it can support the needs of teachers in both high and low El concentration schools, schools with different ELD programs, and schools with more or less capacity for supporting El achievement. Additionally, providing on-going professional development builds the capacity within particular schools to support Els by creating local "experts" who can share their experience in future years.

Regardless of how teachers receive training, because the majority of Els are taught in mainstream settings, in-service training should be focused on developing teacher's ability to provide sheltered English instruction (e.g. SIOP or SDAIE). Sheltered instruction is not a specific program, but refers to a framework for how teachers can support Els in a mainstream setting by using specific strategies to scaffold content area instruction. Teachers using sheltered instruction focus on developing academic vocabulary, building background knowledge, providing abundant opportunities for students to interact with their peers, and adapting instruction to make language comprehensible. When implemented with fidelity, these programs have been found to be effective (Short, Hudec & Echevarria, 2002).

A benefit of sheltered instruction is that it can be used to support Els in any content area. An obstacle, however, is that sheltered instruction is often not used consistently, even among teachers who have received training (August & Hakuta, 1997). Often teachers implement only some of the many pieces of the sheltered instruction framework. Job-embedded professional development that offers ongoing support is an ideal way to ensure that teachers not only understand the ideas that undergird sheltered instruction, but also actually implement sheltered instruction in a way that is beneficial for students.

As with teachers, the necessary preparation needed for principals to support the needs of Els can occur through pre-professional training or in-service training. A key lever for ensuring that all principals receive training related to how to create schools that support Els are the ISLCCC (Interstate School Leaders Licensure Consortium) standards, which define the essential knowledge and skills that school leaders need to create productive schools. These standards, adopted by 45 states and Washington D.C., as well as a multitude of individual principal preparation programs, guide principal preparation and evaluation. It is essential that these or other influential standards include an explicit standard related to “Equity and Cultural Responsiveness” to ensure that these issues are not treated as an afterthought, but instead become a fundamental component of a school leader’s preparation. Given the population growth of Els in North Carolina, it is reasonable to expect that future principals will have to strategize for the El population at some point in their careers, and preparation programs and professional standards should reflect this reality.

Final Remarks

Demographic change driven by immigration as well as natural growth in the population has changed the face of public schools. In 2012-13, almost 10% of students across the U.S. were learning English as a second language in school, and the population of Els is projected to continue growing and spreading geographically in the next several decades (“English Language Learners,” 2015; Frey, 2014). Many Els lag behind their native English speaking peers, but this study shows Els can overcome language barriers to succeed at the highest levels. It is a demographic and moral imperative for educators to provide not only adequate, but excellent, supports to students learning English to ensure that they become a successful and productive part of our society.

This dissertation attempted to show how Els are experiencing school in North Carolina, a new immigrant destination state. The study uncovered that at the state level there are no explicit requirements regarding who can teach Els or what training these teachers need. As such, only a tiny a fraction of teachers have an ESL credential or pre-service training. This study also revealed that districts and schools have autonomy for how to support English language development and how to assign Els to classrooms. Because Els still make up a small minority of students, they are typically not being segregated from NESs based on their linguistic proficiency. However, segregation is increasing gradually over time and Els tend to be more segregated as the population of Els in a school or district increases. This study did not show that placing Els in segregated settings improved achievement, but that in some specific cases was related to decreases in achievement. Considering that Els performed the same or better in mainstream or singleton classes, districts and schools must use their autonomy to integrate Els with their NES peers as their population grows to ensure that Els have equal opportunities to learn.

Schools in North Carolina and other new immigrant destinations are at the forefront of changes that will come to schools across the country in the next few decades. As it stands, the response to demographic change at the state level has been tepid, and as a result patterns of marginalization are becoming institutionalized. Els are taught by teachers who are not formally trained to teach them, and schools often do not have a clear program of support in place to improve and accelerate Els' second language acquisition. Without direction, schools will default to a status quo that typically marginalizes minority students. At this point, what is most needed is a sense of urgency around creating a school system that proactively addresses the needs of Els and holds policy makers and educators accountable for their success.

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APPENDIX A

Table A 1. ***Characteristics of Common Bilingual Programs***

	Language of Instruction	**Target Students**	**Length of Program**	**School level offered**	**Expected outcome**
Bilingual					
Transitional Early Exit	L1 & English*	Els	2-5 Years	Elementary	proficiency in English
Transitional Late Exit	L1 & English	Els	6-7 years	Elementary	proficiency in L1 and English
Dual Immersion	L1 & English	Els and NESs	6-7 years	Elementary	proficiency in L1 and English
One way immersion	L2	NESs	NA	Elementary	proficiency in L2
English only	**Language of Instruction**	**Target Students**	**Setting**	**School level offered**	**Expected Outcome**
Content Based*	English	Els	Mainstream	Elementary, Middle, and High school	proficiency in English
Pull Out	English	Els	Segregated	Elementary, Middle, and High school	proficiency in L1 and English

* Content based includes SIOP, sheltered instruction, and push in program models.

Construction of Unevenness Measures

The first step in calculating unevenness is to calculate the exposure index. The class exposure index, presented in equation four, gives the average majority group proportion across classes in a school, weighted by the proportion of minority group members in the school (Massey & Denton, 1989).

Equation 1 ***Class Exposure Index***

$$_{a}P_{b} = \sum_{j=1}^{n} \frac{a_j}{A} * \frac{b_j}{t_j}$$

Where $_{a}P_{b}$ is the exposure of minority group a to majority group b, a_j represents the number of minority group members in class j, A represents the total number of minority members in the school, b_j is the number of majority members in the classroom, and t_j is the total number of students in the classroom. The exposure index can be interpreted as the probability that a random member of group a in school s will be exposed to a member of group b in his or her classroom. The school exposure index is calculated in the same way, but the values are aggregated one level higher: a_j represents the number of minority group members in school j, A represents the total number of minority members in the district, b_j is the number of majority members in the school, and t_j is the total number of students in the school

I calculate and utilize a gap based segregation index that measures the difference between the maximum exposure rate, which is equivalent to the percentage of Group B members in the school district, and the observed exposure rate (Conger, 2005; Clotfelter, 2002). This measure is what I term *Between-school Unevenness.* The formula for school J follows:

Equation 2 ***Gap Based Segregation Index (Between-school Unevenness)***

$$\boldsymbol{S_s} = \frac{(\%\boldsymbol{GroupB_{l-}}\ {}_{\boldsymbol{a}}\boldsymbol{P_b})}{\%\boldsymbol{GroupBl}}$$

Where S indicates the Segregation Index for school s, $\%GroupB_l$ is the percent of group B members in the school district *l*, and ${}_aP_b$ is the exposure rate defined above. The Segregation Index ranges from 0 to 1 with 0 indicating that the on average the classroom composition of school S reflects the El profile of the district and 1 indicating complete segregation by classroom.

Within-school unevenness is calculated using Equation 3.

Equation 3 ***Gap Based Segregation Index (Within-school Unevenness)***

$$\boldsymbol{Within\ School\ Unevenness_{ws}} = \frac{({}^{S}_{a}\boldsymbol{P_b}\ {}^{C}_{a}\boldsymbol{P_b})}{\%GroupB_{\mathrm{I}}}$$

Where ${}^{S}_{a}\boldsymbol{P_b}$ is the exposure of Els to NES in school and ${}^{C}_{a}\boldsymbol{P_b}$ is the exposure of Els to NES in the class, as calculated using the class or school variation of Equation 1. $\%GroupB_l$ is the percent of group B members in the school district *l.* Total School unevenness is the sum of within and between-school unevenness.

Table A2 below shows the Segregation Index and Exposure rate were calculated for five hypothetical schools with varied classroom composition.

Table A 2 ***Calculation of Exposure and Segregation Index for 5 Hypothetical Schools with Varying Compositions***

$${}_{a}\boldsymbol{P_b} = \sum_{j=1}^{n} \frac{\boldsymbol{a_j}}{\boldsymbol{A}} * \frac{\boldsymbol{b_j}}{\boldsymbol{t_j}}$$

$$\boldsymbol{Within\ School\ Unevenness_{ws}} = \frac{({}^{S}_{a}\boldsymbol{P_b}\ {}_{-}{}^{C}_{a}\boldsymbol{P_b})}{\%\boldsymbol{NES_d}}$$

${}_{a}\boldsymbol{P_b}$= Exposure of Els to NES in school

$\boldsymbol{S_s}$ = Segregation Index for school

a_j= Els in class J

A= Els in school

b_j= NES in class J

t_j = Class population

$\boldsymbol{B_s}$= NES in school

Id	School #	Els in School	Class ID	Class #	Els in Class	NESs in Class	1st term	2nd term	Class Exposure	% NES School	Segregati Index
1	200	111	1	23	5	18	0.05	0.78	0.04	0.45	0.34
	200	111	2	25	20	5	0.18	0.20	0.04	0.45	0.34
	200	111	3	28	13	15	0.12	0.54	0.06	0.45	0.34
	200	111	4	25	17	8	0.15	0.32	0.05	0.45	0.34
	200	111	5	27	23	4	0.21	0.15	0.03	0.45	0.34
	200	111	6	32	27	5	0.24	0.16	0.04	0.45	0.34
	200	111	7	25	2	23	0.02	0.92	0.02	0.45	0.34
	200	111	8	15	4	11	0.04	0.73	0.03	0.45	0.34
					111	89			0.29	0.45	0.34
2											
	200	81	1	23	18	5	0.22	0.22	0.05	0.60	0.50
	200	81	2	25	21	4	0.26	0.16	0.04	0.60	0.50
	200	81	3	28	26	2	0.32	0.07	0.02	0.60	0.50
	200	81	4	25	2	23	0.02	0.92	0.02	0.60	0.50
	200	81	5	27	1	26	0.01	0.96	0.01	0.60	0.50
	200	81	6	32	3	29	0.04	0.91	0.03	0.60	0.50
	200	81	7	25	6	19	0.07	0.76	0.06	0.60	0.50
	200	81	8	15	4	11	0.05	0.73	0.04	0.60	0.50
					81	119			0.27	0.60	0.50
3											
	200	80	1	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	2	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	3	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	4	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	5	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	6	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	7	25	10	15	0.13	0.60	0.08	0.60	0.00
	200	80	8	25	10	15	0.13	0.60	0.08	0.60	0.00
					80	120			0.60	0.60	0.00
4											
	133	80	1	25	10	15	0.13	0.60	0.08	0.40	0.16
	133	80	2	22	10	12	0.13	0.55	0.07	0.40	0.16
	133	80	3	20	10	10	0.13	0.50	0.06	0.40	0.16
	133	80	4	18	10	8	0.13	0.44	0.06	0.40	0.16
	133	80	5	15	10	5	0.13	0.33	0.04	0.40	0.16
	133	80	6	12	10	2	0.13	0.17	0.02	0.40	0.16
	133	80	7	11	10	1	0.13	0.09	0.01	0.40	0.16
	133	80	8	10	10	0	0.13	0.00	0.00	0.40	0.16
					80	53			0.34	0.40	0.16
5											
	181	85	1	25	25	0	0.29	0.00	0.00	0.53	1.00
	181	85	2	22	22	0	0.26	0.00	0.00	0.53	1.00
	181	85	3	20	20	0	0.24	0.00	0.00	0.53	1.00
	181	85	4	18	18	0	0.21	0.00	0.00	0.53	1.00
	181	85	5	29	0	29	0.00	1.00	0.00	0.53	1.00
	181	85	6	24	0	24	0.00	1.00	0.00	0.53	1.00
	181	85	7	22	0	22	0.00	1.00	0.00	0.53	1.00
	181	85	8	21	0	21	0.00	1.00	0.00	0.53	1.00
					85	96			0.00	0.53	1.00

APPENDIX B: Additional Results

Table B. 1 ***Summary of Segregation Measures by El Status, Math, 2012-13***

	CEL	REL	NES
Std Score	-0.62	0.15	0.01
_	0.84	0.90	0.99
Exp El	0.74	0.79	0.90
_	0.21	0.17	0.12
Extreme Isolation	0.02	0.00	0.00
_	0.12	0.06	0.00
Extreme Exposure	0.08	0.10	0.32
_	0.27	0.30	0.47
Within-school Seg	0.10	0.07	0.10
_	0.05	0.02	0.05
Between-school Seg	0.06	0.03	0.05
_	0.04	0.02	0.04
Total Seg	0.16	0.10	0.14
_	0.06	0.03	0.06
Class CEL %	0.23	0.08	0.07
_	0.18	0.10	0.09
Class REL %	0.07	0.17	0.07
_	0.09	0.12	0.08
Class Latino %	0.31	0.25	0.16
_	0.20	0.18	0.13
Class Black %	0.28	0.26	0.25
_	0.21	0.20	0.22
Class White %	0.32	0.41	0.50
_	0.25	0.26	0.27
Class Free Lunch %	0.70	0.61	0.55
_	0.22	0.25	0.25
N	38254.00	36933.00	377439.00

Table B. 2 *Summary of Segregation Measures by Urbanicity and El Status, Math, 2012-13*

Math	**Current El**			**Former El**		
	Urban	Rural	Suburban	Urban	Rural	Suburban
Std Score	-0.58	-0.67	-0.52	0.25	0.03	0.24
_	0.88	0.80	0.93	0.93	0.85	0.91
Exp El	0.71	0.76	0.79	0.78	0.80	0.83
_	0.21	0.21	0.16	0.16	0.18	0.13
Extreme Isolation	0.02	0.01	0.01	0.00	0.00	0.00
_	0.14	0.11	0.09	0.05	0.06	0.04
Extreme Exposure	0.06	0.10	0.09	0.07	0.13	0.11
_	0.23	0.30	0.29	0.26	0.34	0.31
Within-school Seg	0.10	0.09	0.10	0.07	0.07	0.07
_	0.03	0.05	0.04	0.01	0.02	0.02
Between-school Seg	0.08	0.05	0.02	0.02	0.04	0.01
_	0.04	0.04	0.02	0.01	0.03	0.01
Total Seg	0.18	0.15	0.12	0.10	0.11	0.08
_	0.05	0.07	0.05	0.02	0.04	0.02
Class CEL %	0.25	0.21	0.19	0.08	0.07	0.06
_	0.19	0.17	0.14	0.11	0.10	0.08
Class REL %	0.08	0.08	0.06	0.17	0.17	0.15
_	0.09	0.10	0.08	0.11	0.13	0.09
Class Latino %	0.31	0.32	0.24	0.24	0.27	0.20
_	0.19	0.21	0.16	0.17	0.19	0.13
Class Black %	0.37	0.21	0.14	0.34	0.19	0.12
_	0.20	0.19	0.14	0.21	0.18	0.14
Class White %	0.22	0.41	0.52	0.31	0.48	0.58
_	0.22	0.25	0.21	0.25	0.26	0.20
Class Free Lunch %	0.70	0.71	0.63	0.56	0.64	0.58
_	0.25	0.19	0.23	0.28	0.22	0.23
N	163216	197555	36260	163216	197555	36260

Table B. 3 *Summary of Segregation Measures by School El Concentration and El Status, Math, 2012-13*

	Current El			**Former El**		
	High	Medium	Low	High	Medium	Low
Std Score	-0.66	-0.63	-0.57	0.03	0.15	0.23
_	0.82	0.84	0.87	0.84	0.90	0.91
Exp El	0.55	0.77	0.92	0.58	0.81	0.93
_	0.19	0.16	0.13	0.16	0.13	0.09
Extreme Isolation	0.02	0.01	0.01	0.00	0.00	0.00
_	0.15	0.12	0.11	0.05	0.06	0.06
Extreme Exposure	0.00	0.04	0.30	0.01	0.05	0.31
_	0.07	0.20	0.46	0.08	0.23	0.46
Class CEL %	0.36	0.20	0.11	0.17	0.07	0.02
_	0.19	0.15	0.12	0.14	0.08	0.04
Class REL %	0.12	0.07	0.03	0.28	0.17	0.09
_	0.12	0.08	0.04	0.13	0.10	0.08
Class Latino %	0.51	0.28	0.15	0.48	0.23	0.12
_	0.17	0.16	0.12	0.16	0.13	0.09
Class Black %	0.28	0.30	0.24	0.28	0.27	0.20
_	0.17	0.22	0.23	0.18	0.21	0.21
Class White %	0.14	0.34	0.55	0.18	0.41	0.60
_	0.15	0.23	0.25	0.16	0.23	0.24
Class Free Lunch %	0.85	0.68	0.56	0.82	0.59	0.48
_	0.12	0.21	0.23	0.15	0.24	0.24
N	42345	227239	183042	42345	227239	183042

Table B. 4 ***Summary of Segregation Measures by School Level and El Status, Math, 2012-13***

	Current El		Reclassified El	Current El		Reclassified El
	ES		MS	ES		MS
Std Score		-0.57	-0.71		0.16	0.14
_		0.87	0.79		0.89	0.90
Exp El		0.74	0.73		0.78	0.80
_		0.20	0.22		0.18	0.16
Extreme Isolation		0.01	0.02		0.00	0.00
_		0.10	0.15		0.04	0.07
Extreme Exposure		0.08	0.08		0.10	0.10
_		0.28	0.27		0.30	0.31
Within-school Seg CEL		0.08	0.13		0.08	0.12
_		0.04	0.05		0.03	0.05
Between-school Seg CEL		0.07	0.04		0.07	0.03
_		0.04	0.03		0.04	0.03
Total Seg CEL		0.15	0.16		0.15	0.16
_		0.06	0.06		0.05	0.06
Within-school Seg REL		0.08	0.07		0.08	0.07
_		0.02	0.02		0.02	0.01
Between-school Seg REL		0.03	0.02		0.03	0.02
_		0.02	0.03		0.02	0.02
Total Seg REL		0.11	0.09		0.11	0.09
_		0.03	0.03		0.03	0.03
Class CEL %		0.24	0.22		0.10	0.06
_		0.17	0.19		0.11	0.09
Class REL %		0.06	0.10		0.17	0.17
_		0.09	0.09		0.11	0.12
Class Latino %		0.32	0.30		0.28	0.24
_		0.20	0.19		0.19	0.17
Class Black %		0.26	0.31		0.25	0.26
_		0.20	0.22		0.20	0.21
Class White %		0.33	0.31		0.38	0.42
_		0.26	0.25		0.26	0.26
Class Free Lunch %		0.69	0.72		0.63	0.59
_		0.23	0.20		0.25	0.25
N		220794	231832		220794	231832

Table B. 5 ***Summary of Segregation Measures by Immigrant Growth Profile and El Status, Math, 2012-13***

	Current EL				Reclassified EL			
	ND	EG	ES	LI	ND	EG	ES	LI
Std Score	-0.95	-0.95	-0.94	-0.85	0.09	0.00	0.06	0.15
_	0.83	0.81	0.80	0.84	0.80	0.78	0.80	0.82
Exp El	0.72	0.65	0.80	0.80	0.78	0.73	0.84	0.86
_	0.23	0.24	0.20	0.24	0.16	0.17	0.14	0.15
Extreme Isolation	0.04	0.06	0.02	0.04	0.00	0.00	0.00	0.00
_	0.19	0.23	0.15	0.19	0.06	0.05	0.04	0.04
Extreme Exposure	0.07	0.02	0.12	0.19	0.07	0.03	0.12	0.21
_	0.25	0.16	0.33	0.40	0.25	0.17	0.33	0.40
Within-school Seg CEL	0.12	0.13	0.11	0.12	0.14	0.15	0.11	0.14
_	0.08	0.10	0.07	0.08	0.09	0.11	0.06	0.10
Between-school Seg CEL	0.06	0.06	0.04	0.05	0.05	0.05	0.03	0.05
_	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04
Total Seg CEL	0.18	0.19	0.15	0.17	0.19	0.19	0.14	0.19
_	0.08	0.10	0.08	0.09	0.09	0.11	0.07	0.11
Within-school Seg REL	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07
_	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Between-school Seg REL	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
_	0.01	0.02	0.03	0.03	0.01	0.02	0.03	0.02
Total Seg REL	0.11	0.11	0.10	0.10	0.10	0.10	0.09	0.09
_	0.03	0.04	0.04	0.04	0.03	0.04	0.04	0.03
Class CEL %	0.25	0.30	0.17	0.19	0.08	0.10	0.05	0.04
_	0.22	0.23	0.17	0.21	0.10	0.11	0.08	0.08
Class REL %	0.07	0.08	0.07	0.06	0.17	0.20	0.14	0.13
_	0.09	0.10	0.09	0.08	0.11	0.12	0.10	0.10
Class Latino %	0.32	0.41	0.24	0.24	0.26	0.33	0.19	0.18
_	0.20	0.23	0.19	0.20	0.17	0.17	0.15	0.15
Class Black %	0.33	0.23	0.20	0.26	0.34	0.24	0.17	0.24
_	0.22	0.18	0.20	0.22	0.21	0.18	0.18	0.21
Class White %	0.26	0.29	0.48	0.41	0.31	0.36	0.55	0.50
_	0.25	0.22	0.25	0.28	0.25	0.22	0.23	0.26
Class Free Lunch %	0.72	0.75	0.66	0.61	0.64	0.69	0.57	0.51
_	0.22	0.19	0.21	0.25	0.24	0.21	0.24	0.25
N	133046	104554	71692	142296	133046	104554	71692	142296

Table B. 6 *Summary of Segregation Measures by El Status, ELA, Over Time*

	Current EL							Former El						
	0607	0708	0809	0910	1011	1112	1213	0607	0708	0809	0910	1011	1112	1213
Std Score	-0.78	-0.75	-0.74	-0.84	-0.86	-0.91	-0.93	0.07	-0.04	0.15	0.22	0.18	-0.78	-0.75
–	0.92	0.89	0.89	0.91	0.90	0.90	0.82	0.85	0.89	0.76	0.72	0.74	0.92	0.89
Exp El	0.82	0.79	0.79	0.73	0.72	0.70	0.72	0.88	0.84	0.84	0.82	0.81	0.82	0.79
–	0.21	0.23	0.21	0.24	0.23	0.28	0.24	0.14	0.18	0.16	0.17	0.17	0.21	0.23
Extreme Isolation	0.03	0.04	0.02	0.03	0.03	0.08	0.04	0.01	0.01	0.00	0.00	0.00	0.03	0.04
–	0.18	0.19	0.14	0.18	0.17	0.27	0.20	0.08	0.11	0.05	0.06	0.06	0.18	0.19
Extreme Exposure	0.21	0.19	0.15	0.12	0.08	0.12	0.08	0.28	0.25	0.20	0.17	0.12	0.21	0.19
–	0.41	0.40	0.36	0.32	0.27	0.33	0.27	0.45	0.43	0.40	0.37	0.32	0.41	0.40
Within-school Seg CEL	0.11	0.13	0.10	0.13	0.12	0.16	0.12	0.11	0.12	0.10	0.12	0.13	0.11	0.13
–	0.05	0.06	0.05	0.07	0.08	0.08	0.09	0.05	0.06	0.04	0.07	0.09	0.05	0.06
Between-school Seg CEL	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.04	0.05	0.06	0.05	0.05	0.04	0.05
–	0.04	0.04	0.05	0.05	0.05	0.05	0.04	0.05	0.04	0.05	0.05	0.05	0.04	0.04
Total Seg CEL	0.16	0.18	0.16	0.19	0.18	0.22	0.18	0.15	0.17	0.16	0.18	0.18	0.16	0.18
–	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.06	0.07	0.06	0.08	0.09	0.06	0.07
Within-school Seg REL	0.07	0.10	0.07	0.08	0.08	0.10	0.08	0.07	0.10	0.07	0.08	0.07	0.07	0.10
–	0.04	0.05	0.03	0.03	0.03	0.04	0.02	0.03	0.05	0.03	0.03	0.03	0.04	0.05
Between-school Seg REL	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.01	0.01	0.02	0.02	0.02	0.01	0.01
–	0.08	0.05	0.06	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.08	0.05
Total Seg REL	0.09	0.11	0.08	0.10	0.10	0.12	0.11	0.08	0.11	0.08	0.09	0.09	0.09	0.11
–	0.08	0.06	0.06	0.05	0.04	0.04	0.03	0.03	0.05	0.03	0.04	0.04	0.08	0.06
Class CEL %	0.22	0.24	0.24	0.27	0.26	0.29	0.25	0.08	0.09	0.11	0.10	0.09	0.22	0.24
–	0.20	0.21	0.19	0.21	0.21	0.26	0.22	0.10	0.11	0.12	0.12	0.11	0.20	0.21
Class REL %	0.02	0.04	0.03	0.04	0.05	0.06	0.07	0.10	0.14	0.11	0.13	0.14	0.02	0.04
–	0.04	0.06	0.05	0.06	0.07	0.09	0.09	0.09	0.13	0.09	0.09	0.10	0.04	0.06
Class Latino %	0.24	0.27	0.27	0.29	0.30	0.34	0.33	0.18	0.21	0.22	0.22	0.22	0.24	0.27
–	0.21	0.22	0.20	0.22	0.21	0.25	0.22	0.16	0.18	0.17	0.18	0.17	0.21	0.22
Class Black %	0.29	0.27	0.28	0.28	0.27	0.26	0.27	0.24	0.24	0.25	0.26	0.26	0.29	0.27
–	0.23	0.22	0.22	0.22	0.21	0.22	0.21	0.21	0.21	0.21	0.21	0.20	0.23	0.22
Class White %	0.39	0.38	0.37	0.34	0.36	0.32	0.32	0.49	0.46	0.44	0.43	0.44	0.39	0.38
–	0.27	0.27	0.27	0.26	0.26	0.26	0.26	0.25	0.26	0.26	0.26	0.26	0.27	0.27
Class Free Lunch %	0.58	0.43	0.53	0.56	0.68	0.73	0.70	0.48	0.28	0.45	0.56	0.58	0.58	0.43
–	0.26	0.31	0.29	0.27	0.23	0.23	0.22	0.26	0.30	0.29	0.25	0.25	0.26	0.31
N	29757	35292	43328	47280	47580	43265	38150	6753	14178	11969	18962	25436	29757	35292

Table B. 7 *Summary of Segregation Measures by El Status, Math, Over Time*

	Current EL							Reclassified El						
	0607	0708	0809	0910	1011	1112	1213	0607	0708	0809	0910	1011	1112	1213
Std Score	-0.55	-0.51	-0.51	-0.59	-0.60	-0.63	-0.62	0.20	0.08	0.29	0.38	0.33	0.28	0.15
_	0.90	0.93	0.91	0.89	0.87	0.89	0.84	0.90	0.91	0.83	0.82	0.84	0.85	0.90
Exp El	0.84	0.80	0.79	0.75	0.73	0.74	0.74	0.88	0.84	0.83	0.81	0.80	0.80	0.79
_	0.18	0.21	0.19	0.20	0.20	0.21	0.21	0.14	0.17	0.15	0.17	0.16	0.17	0.17
Extreme Isolation	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
_	0.12	0.15	0.08	0.10	0.10	0.12	0.12	0.07	0.10	0.02	0.05	0.04	0.05	0.06
Extreme Exposure	0.22	0.16	0.12	0.08	0.07	0.10	0.08	0.28	0.20	0.16	0.13	0.11	0.13	0.10
_	0.41	0.37	0.33	0.27	0.25	0.30	0.27	0.45	0.40	0.37	0.34	0.31	0.33	0.30
Within-school Seg CEL	0.10	0.11	0.08	0.09	0.09	0.10	0.10	0.09	0.10	0.08	0.09	0.10	0.11	0.11
_	0.06	0.06	0.03	0.04	0.04	0.04	0.05	0.06	0.05	0.03	0.04	0.04	0.04	0.05
Between-school Seg CEL	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.04	0.05	0.06	0.06	0.05	0.05	0.05
_	0.04	0.04	0.05	0.05	0.05	0.05	0.04	0.05	0.04	0.05	0.05	0.05	0.04	0.04
Total Seg CEL	0.14	0.16	0.14	0.15	0.16	0.17	0.16	0.13	0.14	0.14	0.15	0.15	0.16	0.15
_	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06
Within-school Seg REL	0.07	0.08	0.05	0.07	0.07	0.09	0.08	0.07	0.08	0.05	0.06	0.07	0.08	0.07
_	0.03	0.03	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.01	0.01	0.02	0.02	0.02
Between-school Seg REL	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.01	0.01	0.02	0.02	0.02	0.02	0.03
_	0.08	0.05	0.06	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Total Seg REL	0.09	0.10	0.07	0.08	0.09	0.11	0.11	0.08	0.09	0.07	0.08	0.09	0.10	0.10
_	0.08	0.05	0.05	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.03	0.03
Class CEL %	0.20	0.22	0.22	0.24	0.24	0.24	0.23	0.08	0.09	0.11	0.10	0.09	0.09	0.08
_	0.17	0.19	0.17	0.18	0.18	0.18	0.18	0.10	0.11	0.12	0.12	0.11	0.11	0.10
Class REL %	0.02	0.04	0.03	0.04	0.05	0.06	0.07	0.10	0.12	0.10	0.12	0.13	0.16	0.17
_	0.04	0.06	0.05	0.06	0.07	0.08	0.09	0.09	0.12	0.07	0.08	0.09	0.11	0.12
Class Latino %	0.23	0.26	0.25	0.27	0.28	0.31	0.31	0.18	0.20	0.21	0.21	0.22	0.25	0.25
_	0.18	0.20	0.18	0.19	0.18	0.20	0.20	0.15	0.17	0.16	0.17	0.16	0.18	0.18
Class Black %	0.30	0.28	0.29	0.29	0.28	0.28	0.28	0.24	0.25	0.25	0.25	0.25	0.26	0.26
_	0.22	0.22	0.22	0.21	0.20	0.21	0.21	0.20	0.20	0.20	0.21	0.20	0.21	0.20
Class White %	0.39	0.39	0.37	0.36	0.37	0.33	0.32	0.50	0.46	0.45	0.44	0.44	0.41	0.41
_	0.27	0.26	0.26	0.26	0.25	0.26	0.25	0.25	0.26	0.26	0.26	0.26	0.26	0.26
Class Free Lunch %	0.58	0.42	0.52	0.56	0.67	0.72	0.70	0.47	0.28	0.45	0.56	0.57	0.62	0.61
_	0.25	0.30	0.29	0.26	0.23	0.22	0.22	0.26	0.29	0.29	0.25	0.25	0.26	0.25
N	29780	35660	43813	47745	48074	43267	38254	6762	14236	11967	18972	25527	31944	36933

Table B. 8 ***Characteristics of Teachers By El Status, Math, 2012-13***

	CEL	REL	NES
ESL Credential	0.04	0.01	0.01
_	0.20	0.12	0.11
Prev Year El Exp	0.55	0.58	0.43
_	0.50	0.49	0.50
Years Exp	10.03	10.22	10.61
_	8.39	8.39	8.46
New Teacher	0.21	0.20	0.19
_	0.11	0.11	0.10
Avg Test Score	0.16	0.17	0.18
_	0.70	0.68	0.69
Same Race	0.06	0.06	0.56
_	0.23	0.23	0.50
Years El Exp	2.89	3.02	2.39
_	2.09	2.20	1.94
Any ESL Education	0.00	0.01	0.00
_	0.05	0.23	0.02
Latino	0.02	0.01	0.01
_	0.14	0.11	0.10
White	0.80	0.82	0.84
_	0.40	0.38	0.37
Black	0.15	0.14	0.12
_	0.35	0.35	0.33
N	1380.00	969.00	10650.00

Table B. 9 ***Summary of Teacher Characteristics by Urbanicity and El Status, Math, 2012-13***

	Current El			**Reclassified El**		
	Urban	Rural	Urban	Rural	Urban	Rural
Std Score	-0.58	-0.67	-0.52	0.25	0.03	0.24
_	0.88	0.80	0.93	0.93	0.85	0.91
ESL Credential	0.02	0.02	0.02	0.01	0.01	0.01
_	0.15	0.15	0.15	0.11	0.09	0.12
Prev Year El Exp	0.61	0.56	0.49	0.59	0.53	0.52
_	0.49	0.50	0.50	0.49	0.50	0.50
Years Exp	9.06	10.63	10.82	9.68	11.09	11.71
_	8.16	8.26	8.56	8.42	8.56	8.98
New Teacher	0.23	0.20	0.20	0.23	0.21	0.19
_	0.11	0.10	0.09	0.11	0.10	0.09
Avg Test Score	0.20	0.10	0.34	0.23	0.09	0.35
_	0.72	0.68	0.66	0.74	0.69	0.68
N	163216	197555	36260	163216	197555	36260

Table B. 10 ***Summary Teacher Characteristics by School El Concentration and El Status, Math, 2012-13***

		Current EL			**Reclassified El**	
	High	Medium	Low	High	Medium	Low
Std Score	-0.66	-0.63	-0.57	0.03	0.15	0.23
_	0.82	0.84	0.87	0.84	0.90	0.91
ESL Credential	0.04	0.02	0.02	0.03	0.01	0.01
_	0.20	0.14	0.13	0.17	0.10	0.07
Prev Year El Exp	0.68	0.62	0.28	0.68	0.61	0.28
_	0.47	0.49	0.45	0.47	0.49	0.45
Years Exp	11.70	13.31	13.80	12.85	13.99	15.00
_	8.17	8.18	8.01	8.35	8.05	8.08
New Teacher	0.25	0.21	0.18	0.25	0.22	0.18
_	0.11	0.10	0.10	0.11	0.10	0.10
Avg Test Score	0.12	0.18	0.16	0.09	0.19	0.18
_	0.71	0.70	0.70	0.73	0.72	0.72
N	42345	227239	183042	42345	227239	183042

Table B. 11 ***Summary of Teacher Characteristics by School Level and El Status, Math, 2012-13***

	Current El		Reclassified EL	
	ES	MS	ES	MS
Std Score	-0.56	-0.75	0.13	0.11
_	0.89	0.84	0.86	0.89
ESL Credential	0.03	0.07	0.02	0.01
_	0.18	0.25	0.14	0.07
Prev Year El Exp	0.56	0.25	0.58	0.48
_	0.50	0.44	0.49	0.51
Years Exp	9.62	11.46	10.24	10.19
_	8.16	9.03	8.30	8.54
New Teacher	0.20	0.23	0.19	0.23
_	0.10	0.11	0.10	0.11
Avg Test Score	0.16	0.16	0.20	0.12
_	0.70	0.70	0.66	0.70
Same Race	0.06	0.04	0.06	0.05
_	0.24	0.20	0.24	0.22
Years El Exp	2.93	1.09	3.08	1.81
_	2.09	1.24	2.20	1.75
N	220794	231832	220794	231832

Table B. 12 ***Summary of Teacher Characteristics by Immigrant Profile and El Status, Math, 2012-13***

	Current El				Reclassified El			
	ND	EG	ES	LI	ND	EG	ES	LI
Std Score	-0.59	-0.65	-0.72	-0.46	0.14	0.06	0.06	0.21
_	0.89	0.84	0.85	0.94	0.86	0.85	0.85	0.92
ESL Credential	0.03	0.04	0.07	0.06	0.01	0.02	0.00	0.02
_	0.16	0.19	0.25	0.24	0.10	0.15	0.00	0.13
Prev Year El Exp	0.51	0.64	0.49	0.47	0.60	0.68	0.55	0.42
_	0.50	0.48	0.50	0.50	0.49	0.47	0.50	0.50
Years Exp	9.10	10.37	12.03	10.18	10.12	9.49	12.11	10.11
_	8.48	8.19	8.95	8.06	8.89	7.99	9.01	7.69
New Teacher	0.22	0.21	0.17	0.19	0.22	0.21	0.16	0.20
_	0.11	0.10	0.10	0.10	0.12	0.10	0.09	0.11
Avg Test Score	0.19	0.11	0.09	0.22	0.17	0.16	0.16	0.19
_	0.68	0.71	0.65	0.71	0.69	0.68	0.66	0.67
Same Race	0.06	0.05	0.02	0.07	0.07	0.03	0.04	0.09
_	0.24	0.22	0.15	0.26	0.25	0.16	0.20	0.29
Years El Exp	2.69	3.43	2.71	2.21	3.08	3.39	3.44	2.21
_	1.90	2.26	1.96	1.89	2.07	2.29	2.38	1.93
N	133455	105387	71059	142725	133455	105387	71059	142725

Table B. 13 ***Summary of Teacher Characteristics over time, by El Status, ELA***

	Current El							Reclassified EL						
	0607	0708	0809	0910	1011	1112	1213	0607	0708	0809	0910	1011	1112	1213
ESL Credential	0.08	0.06	0.05	0.06	0.05	0.20	0.10	0.02	0.02	0.01	0.02	0.02	0.02	0.02
_	0.27	0.23	0.22	0.24	0.22	0.40	0.29	0.15	0.15	0.11	0.15	0.13	0.16	0.14
El Exp	0.64	0.66	0.65	0.64	0.63	0.63	0.54	0.63	0.57	0.65	0.66	0.67	0.60	0.49
_	0.48	0.47	0.48	0.48	0.48	0.48	0.50	0.48	0.50	0.48	0.47	0.47	0.49	0.50
Years Exp	13.51	13.70	12.91	12.79	12.62	12.27	12.02	13.51	12.83	13.24	12.65	13.52	13.30	12.82
_	9.15	8.97	8.45	8.40	8.61	8.54	8.08	8.53	8.53	8.65	8.01	8.34	8.46	8.36
New Teacher	0.24	0.24	0.24	0.22	0.20	0.20	0.21	0.21	0.22	0.24	0.21	0.21	0.21	0.21
_	0.11	0.11	0.11	0.11	0.10	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.11
Avg Test Score			0.12	0.14	0.15	0.18				0.12	0.18	0.19	0.22	
_			0.72	0.72	0.70	0.72				0.70	0.73	0.70	0.67	
Same Race	0.06	0.05	0.05	0.04	0.08	0.09	0.06	0.04	0.07	0.05	0.06	0.07	0.06	0.06
_	0.25	0.22	0.21	0.20	0.26	0.29	0.23	0.21	0.26	0.23	0.23	0.25	0.23	0.24
Years El Exp	2.94	3.28	3.35	3.32	3.23	3.01	2.71	3.08	3.27	3.37	3.35	3.31	3.03	2.57
_	2.12	2.04	2.02	1.99	2.02	2.09	2.06	2.32	2.09	2.07	2.01	1.96	2.01	1.94
N	29757	35292	43328	47280	47580	43265	38150	6753	14178	11969	18962	25436	31946	36668.00

Table B. 14 ***Summary of Teacher Characteristics over time, by El Status, Math***

	Current EL							Reclassified EL						
	0607	0708	0809	0910	1011	1112	1213	0607	0708	0809	0910	1011	1112	1213
ESL Credential	0.04	0.04	0.03	0.03	0.03	0.04	0.04	0.02	0.03	0.02	0.03	0.03	0.02	0.01
_	0.20	0.19	0.16	0.18	0.17	0.19	0.20	0.14	0.17	0.14	0.18	0.16	0.13	0.12
El Exp	0.64	0.67	0.66	0.67	0.66	0.66	0.55	0.56	0.61	0.62	0.65	0.64	0.62	0.58
_	0.48	0.47	0.47	0.47	0.48	0.47	0.50	0.50	0.49	0.48	0.48	0.48	0.48	0.49
Years Exp	13.12	12.91	13.03	12.77	12.24	12.30	12.39	12.69	13.08	13.42	12.96	12.90	13.27	12.92
_	8.53	8.30	8.56	8.42	8.25	8.61	8.42	9.22	8.27	8.62	7.94	8.21	8.56	8.27
New Teacher	0.25	0.24	0.24	0.22	0.21	0.21	0.21	0.23	0.21	0.23	0.21	0.21	0.21	0.20
_	0.11	0.11	0.11	0.10	0.10	0.11	0.11	0.10	0.10	0.11	0.10	0.10	0.11	0.11
Avg Test Score			0.11	0.15	0.15	0.16				0.13	0.14	0.20	0.17	
_			0.73	0.71	0.70	0.70				0.72	0.73	0.68	0.68	
Same Race	0.05	0.04	0.05	0.05	0.07	0.05	0.06	0.04	0.09	0.04	0.06	0.07	0.06	0.06
_	0.22	0.20	0.21	0.21	0.26	0.23	0.23	0.20	0.28	0.19	0.24	0.25	0.24	0.23
Years El Exp	3.07	3.33	3.37	3.41	3.38	3.15	2.89	2.00	3.31	3.33	3.56	3.30	3.19	3.02
_	2.12	2.06	2.01	1.97	1.99	1.96	2.09	1.95	2.12	2.08	2.05	1.99	2.00	2.20
ESL Education	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01
_	0.10	0.00	0.22	0.08	0.06	0.04	0.05	0.00	0.11	0.08	0.07	0.00	0.00	0.23
N	29780	35660	43813	47745	48074	43267	38254	4146	14236	11967	18972	25527	31944	36933

Table B. 15 ***Math Classroom Characteristics by Level of Exposure, El Status***

	CEL Segregated	Mainstream	Singleton	REL Segregated	Mainstream	Singleton
ESL Credential	0.24	0.01	0.01	0.04	0.01	0.01
	(0.43)	(0.11)	(0.08)	(0.20)	(0.10)	(0.07)
El Experience	0.52	0.66	0.45	0.63	0.69	0.51
	(0.50)	(0.47)	(0.50)	(0.48)	(0.46)	(0.50)
Class Size	13.58	22.67	21.31	14.80	23.80	23.17
	(9.17)	(4.57)	(5.78)	(9.79)	(4.59)	(5.37)
Peer Achievement	-0.36	-0.27	-0.19	-0.14	0.05	0.24
	(0.67)	(0.51)	(0.60)	(0.68)	(0.62)	(0.69)
Elementary	0.27	0.46	0.39	0.21	0.45	0.39
	(0.44)	(0.50)	(0.49)	(0.41)	(0.50)	(0.49)
ms	0.73	0.54	0.61	0.79	0.55	0.61
	(0.44)	(0.50)	(0.49)	(0.41)	(0.50)	(0.49)
ESL Course	0.21	0.00	0.01	0.10	0.00	0.01
	(0.41)	(0.06)	(0.10)	(0.30)	(0.07)	(0.11)
Advanced	0.05	0.05	0.08	0.19	0.13	0.17
	(0.22)	(0.22)	(0.27)	(0.39)	(0.33)	(0.38)
Remedial	0.32	0.01	0.05	0.13	0.01	0.02
	(0.47)	(0.11)	(0.21)	(0.34)	(0.08)	(0.13)
Years Experience	10.20	9.93	11.10	10.21	10.42	11.67
	(9.28)	(8.83)	(9.22)	(9.74)	(8.81)	(9.12)
newteach	0.32	0.29	0.25	0.32	0.26	0.22
	(0.47)	(0.45)	(0.43)	(0.47)	(0.44)	(0.41)
Teacher Avg. Test Score	0.09	0.10	0.08	0.11	0.10	0.10
	(0.53)	(0.61)	(0.63)	(0.51)	(0.56)	(0.59)
Observations	48834			41664		

Table B. 16 ***Summary of School Context Variables Used in Analyses, by School Level and El Status, Math***

	Reclassified			Current El		
	ES	MS	Pooled	ES	MS	Pooled
Evenness of CEL	8.04	12.12	10.26	8.02	11.70	9.97
	(2.76)	(4.50)	(4.32)	(2.88)	(4.52)	(4.25)
Evenness of REL	7.76	6.63	7.15	7.53	6.29	6.87
	(2.04)	(1.68)	(1.94)	(2.15)	(1.76)	(2.05)
School % El	22.37	17.54	19.74	24.99	18.19	21.39
	(14.19)	(11.07)	(12.81)	(15.55)	(12.82)	(14.57)
%Teacher Same Race	6.38	5.78	6.05	4.63	4.80	4.72
	(20.35)	(19.12)	(19.69)	(16.53)	(16.73)	(16.64)
School % ESL Cred	2.37	0.88	1.56	2.87	0.99	1.87
	(6.08)	(3.43)	(4.88)	(7.57)	(3.91)	(5.99)
Bilingual/Heritage	0.05	0.07	0.06	0.06	0.10	0.08
	(0.22)	(0.26)	(0.25)	(0.23)	(0.31)	(0.27)
New Destination School	0.36	0.25	0.30	0.37	0.27	0.32
	(0.48)	(0.43)	(0.46)	(0.48)	(0.45)	(0.47)
Established and Growing	0.30	0.33	0.32	0.36	0.37	0.37
	(0.46)	(0.47)	(0.47)	(0.48)	(0.48)	(0.48)
Established and Stable	0.11	0.17	0.15	0.10	0.15	0.12
	(0.32)	(0.38)	(0.35)	(0.29)	(0.36)	(0.33)
Low Incidence	0.22	0.25	0.24	0.18	0.21	0.19
	(0.42)	(0.43)	(0.43)	(0.38)	(0.40)	(0.39)
Observations	124784			142218		

Table B. 17 ***Summary of Additional School Variables Used in Analyses, by El Status, ELA***

	Reclassified El	Current El
Elementary	0.46	0.48
	(0.50)	(0.50)
School Size	7.05	6.78
	(2.55)	(2.45)
PPE	75.33	81.53
	(16.86)	(18.82)
Title 3 Funds	3.65	3.39
	(4.08)	(3.90)
% Full Credential	0.97	0.96
	(0.05)	(0.06)
% NBC	0.12	0.11
	(0.09)	(0.08)
% Adv Degree	0.29	0.29
	(0.10)	(0.10)
School % Minority	0.47	0.51
	(0.25)	(0.25)
School % Free Lunch	0.57	0.59
	(0.22)	(0.23)
N (Schools)	3,847	4,719

Table B. 18 ***Summary of Student Variables Used in Analyses, by El Status and School Level, Math***

	Reclassified			Current El		
	ES	MS	Pooled	ES	MS	Pooled
Std.Score	0.42	0.15	0.27	-0.32	-0.64	-0.49
	(0.81)	(0.88)	(0.86)	(0.83)	(0.88)	(0.87)
Prior Achievement	0.18	0.16	0.17	-0.59	-0.62	-0.61
	(0.83)	(0.83)	(0.83)	(0.82)	(0.83)	(0.82)
Years CEL	1.67	0.91	1.25	3.96	3.83	3.89
	(1.49)	(1.21)	(1.40)	(1.38)	(1.39)	(1.39)
Current El	0.00	0.00	0.00	1.00	1.00	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Male	0.47	0.47	0.47	0.54	0.55	0.55
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
White	0.05	0.05	0.05	0.03	0.04	0.04
	(0.23)	(0.22)	(0.22)	(0.18)	(0.19)	(0.19)
Asian	0.14	0.13	0.14	0.10	0.11	0.10
	(0.35)	(0.34)	(0.34)	(0.29)	(0.32)	(0.31)
Black	0.02	0.02	0.02	0.02	0.03	0.03
	(0.15)	(0.15)	(0.15)	(0.15)	(0.17)	(0.16)
Latino	0.77	0.78	0.77	0.83	0.81	0.82
	(0.42)	(0.42)	(0.42)	(0.37)	(0.39)	(0.38)
Other Race	0.02	0.01	0.02	0.01	0.01	0.01
	(0.13)	(0.12)	(0.12)	(0.11)	(0.10)	(0.11)
Special Needs	0.04	0.03	0.03	0.13	0.13	0.13
	(0.19)	(0.17)	(0.18)	(0.34)	(0.33)	(0.34)
Gifted	0.14	0.15	0.15	0.02	0.01	0.02
	(0.35)	(0.36)	(0.35)	(0.13)	(0.12)	(0.12)
Moved in Year	0.05	0.04	0.04	0.11	0.11	0.11
	(0.21)	(0.19)	(0.20)	(0.31)	(0.31)	(0.31)
Summer Move	0.09	0.06	0.07	0.11	0.08	0.09
	(0.29)	(0.23)	(0.26)	(0.32)	(0.27)	(0.29)
Forced Move	0.03	0.37	0.21	0.03	0.32	0.18
	(0.16)	(0.48)	(0.41)	(0.16)	(0.47)	(0.39)
Days Absent	4.54	5.50	5.06	4.82	6.62	5.77
	(4.56)	(5.95)	(5.38)	(4.76)	(7.32)	(6.31)
Under Age	0.01	0.01	0.01	0.01	0.02	0.02
	(0.08)	(0.11)	(0.10)	(0.11)	(0.14)	(0.13)
Over Age	0.16	0.20	0.18	0.31	0.39	0.35
	(0.37)	(0.40)	(0.39)	(0.46)	(0.49)	(0.48)
Free Lunch	0.81	0.75	0.78	0.87	0.70	0.78
	(0.40)	(0.43)	(0.42)	(0.33)	(0.46)	(0.41)
Observations	124784			142218		

Table B. 19 ***Summary of Classroom Variables Used in Analyses, by El Status and School Level, Math***

	Reclassified			Current El		
	ES	MS	Pooled	ES	MS	Pooled
Class Size	22.74	24.66	23.78	22.25	23.19	22.75
	(4.01)	(4.91)	(4.62)	(3.93)	(5.14)	(4.63)
Peer Achievement	-0.01	0.04	0.02	-0.17	-0.41	-0.30
	(0.50)	(0.70)	(0.62)	(0.43)	(0.54)	(0.51)
ESL Course	0.00	0.01	0.01	0.00	0.01	0.01
	(0.05)	(0.09)	(0.07)	(0.05)	(0.11)	(0.09)
Advanced	0.00	0.22	0.12	0.00	0.09	0.05
	(0.00)	(0.41)	(0.32)	(0.00)	(0.28)	(0.21)
Remedial	0.00	0.01	0.01	0.00	0.02	0.01
	(0.00)	(0.10)	(0.07)	(0.00)	(0.15)	(0.11)
Class % CEL	0.11	0.07	0.09	0.22	0.22	0.22
	(0.12)	(0.10)	(0.11)	(0.16)	(0.18)	(0.17)
Class % CEL	0.15	0.15	0.15	0.08	0.05	0.07
	(0.10)	(0.11)	(0.11)	(0.08)	(0.07)	(0.08)
Class % REL	0.25	0.22	0.24	0.29	0.27	0.28
	(0.18)	(0.16)	(0.17)	(0.19)	(0.18)	(0.19)
Class % Latino	0.26	0.25	0.26	0.28	0.31	0.29
	(0.20)	(0.21)	(0.21)	(0.21)	(0.22)	(0.21)
Class % Black	0.40	0.44	0.42	0.35	0.34	0.35
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)
Class % White	0.60	0.57	0.59	0.66	0.60	0.63
	(0.26)	(0.25)	(0.26)	(0.25)	(0.26)	(0.26)
Class % FRPL	0.50	0.50	0.50	0.51	0.51	0.51
	(0.10)	(0.13)	(0.12)	(0.11)	(0.14)	(0.12)
Observations	124784			142218		

Table B. 20 ***Full Results of Regression on Std. ELA Achievement, CELs, Pooled***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.19***	-0.19***	-0.00	0.02	-0.07	-0.06	0.03	0.04
	(0.04)	(0.04)	(0.01)	(0.01)	(0.04)	(0.04)	(0.02)	(0.02)
Singleton	0.04***	0.05***	0.00	-0.01	0.03***	0.04***	0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.06**	-0.07**	-0.02	-0.02	-0.04	-0.05	-0.02	-0.03
	(0.02)	(0.02)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)
El Exp	-0.00	-0.01	0.02***	0.03***	-0.00	-0.01	0.02***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.51***	0.49***	-0.11***	-0.20***	0.51***	0.49***	-0.11***	-0.20***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Years CEL	-0.09***	-0.09***	-0.24***	-0.37***	-0.09***	-0.09***	-0.23***	-0.36***
	(0.00)	(0.00)	(0.03)	(0.05)	(0.00)	(0.00)	(0.03)	(0.04)
exiter	-0.28***	-0.28***			-0.28***	-0.28***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.04***	0.04***			0.04***	0.04***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	-0.00	-0.00			-0.00	-0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.05	0.04			0.05	0.04		
	(0.04)	(0.03)			(0.04)	(0.03)		
Asian	-0.06***	-0.05***			-0.06***	-0.05***		
	(0.02)	(0.01)			(0.02)	(0.01)		
Black	-0.04*	-0.03			-0.04*	-0.03		
	(0.02)	(0.02)			(0.02)	(0.02)		
Other Race	0.02	0.02			0.02	0.02		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.12***	-0.13***	0.04**	0.06***	-0.13***	-0.13***	0.04**	0.06***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Gifted	0.43***	0.44***	0.19***	0.15***	0.43***	0.44***	0.19***	0.15***
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)
Moved in Year	-0.23***	-0.22***	-0.04***	-0.03**	-0.23***	-0.22***	-0.04***	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Summer Move	0.03***	0.03***	-0.02*	-0.25***	0.03***	0.03***	-0.02*	-0.25***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.45***	-0.50***	-0.37***	-0.29***	-0.45***	-0.50***	-0.37***	-0.30***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Days Absent	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	-0.07***	-0.07***	-0.44***	-0.37***	-0.07***	-0.07***	-0.44***	-0.37***
	(0.02)	(0.02)	(0.10)	(0.09)	(0.02)	(0.02)	(0.10)	(0.09)
Over Age	-0.07***	-0.08***	0.39***	0.35***	-0.07***	-0.08***	0.39***	0.35***
	(0.00)	(0.00)	(0.02)	(0.03)	(0.00)	(0.00)	(0.02)	(0.03)
Free Lunch	-0.04***	-0.03***			-0.04***	-0.03***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	2.11***	-0.28	3.30***	-1.38**	2.25***	-0.24	3.30***	-1.44**
	(0.56)	(0.70)	(0.33)	(0.51)	(0.57)	(0.70)	(0.33)	(0.51)
Evenness of REL	3.19*	3.82**	8.01***	8.74***	2.89*	3.50**	7.87***	8.65***
	(1.26)	(1.24)	(0.88)	(1.11)	(1.26)	(1.23)	(0.88)	(1.11)
% Teacher Same Race	0.30	0.27	0.20	0.36	0.30	0.28	0.19	0.34
	(0.41)	(0.37)	(0.34)	(0.46)	(0.41)	(0.37)	(0.34)	(0.46)
School % El	0.35	-.28***	.58***	2.79***	0.33	-.27***	.58***	2.80**
	(0.47)	(0.82)	(0.42)	(0.82)	(0.47)	(0.81)	(0.42)	(0.81)
School % ESL Cred	0.54	1.41	0.14	-1.00	0.49	1.28	0.12	-1.07*
	(0.69)	(0.73)	(0.37)	(0.52)	(0.69)	(0.74)	(0.37)	(0.52)

Bilingual/Heritage	-0.02		-0.04***		-0.02		-0.04***	
	(0.01)		(0.01)		(0.01)		(0.01)	
New Destination School	-0.04***		-0.05***		-0.04***		-0.05***	
	(0.01)		(0.01)		(0.01)		(0.01)	
Established and Growing	-0.04**		-0.10***		-0.04**		-0.10***	
	(0.01)		(0.01)		(0.01)		(0.01)	
Established and Stable	-0.02		-0.04***		-0.02		-0.04***	
	(0.01)		(0.01)		(0.01)		(0.01)	
rural	-0.01	-0.01	-0.01	0.00	-0.01	-0.02	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.05***		-0.12***		-0.05***		-0.12***	
	(0.02)		(0.03)		(0.02)		(0.03)	
Class Size	0.00***	0.01***	0.00	-0.00*	0.00***	0.01***	0.00	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	-0.08***	-0.12***	-0.00	0.01*	-0.08***	-0.12***	-0.00	0.01*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Years Experience	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.01	-0.02*	-0.04***	-0.03***	-0.01	-0.01	-0.04***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	-0.01	-0.02	-0.00	0.01	-0.01	-0.02	-0.00	0.01
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Advanced	0.33***	0.37***	0.01	-0.05	0.33***	0.37***	0.01	-0.05
	(0.03)	(0.04)	(0.02)	(0.03)	(0.03)	(0.04)	(0.02)	(0.03)
Remedial	-0.19***	-0.21***	-0.06**	0.00	-0.20***	-0.22***	-0.06**	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Teacher Avg. Test Score	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
School Size	-0.00	-0.03***	-0.03***	-0.11***	-0.00	-0.03***	-0.03***	-0.11***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
School Size Sq	0.00	0.00***	0.00***	0.00***	0.00	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	-0.00	0.00*	-0.01***	-0.02***	-0.00	0.00*	-0.01***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01***	0.02*	0.00	-0.01	0.01***	0.02*	0.00	-0.01
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
% Full Credential	-0.05	-0.17	0.28***	0.74***	-0.06	-0.18*	0.27***	0.72***
	(0.09)	(0.09)	(0.05)	(0.08)	(0.09)	(0.09)	(0.05)	(0.08)
% NBC	0.20***	0.47***	0.63***	2.76***	0.19***	0.46***	0.63***	2.76***
	(0.05)	(0.09)	(0.04)	(0.11)	(0.05)	(0.09)	(0.04)	(0.11)
% Adv Degree	-0.05	-0.07	-0.16***	-0.16*	-0.05	-0.07	-0.16***	-0.16*
	(0.04)	(0.08)	(0.03)	(0.08)	(0.04)	(0.08)	(0.03)	(0.08)
School % Minority	-0.06*	0.11	0.06*	0.38***	-0.06*	0.11	0.06*	0.38***
	(0.02)	(0.09)	(0.03)	(0.09)	(0.02)	(0.09)	(0.03)	(0.09)
School % Free Lunch	-0.02	0.06***	0.24***	0.16***	-0.02	0.06***	0.24***	0.16***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Elementary	0.28***	0.61***	0.43***	0.89***	0.28***	0.61***	0.44***	0.89***
	(0.01)	(0.04)	(0.01)	(0.02)	(0.01)	(0.04)	(0.01)	(0.02)
2010-2011	-0.03***				-0.03***			
	(0.01)				(0.01)			
2011-2012	-0.03**				-0.03**			
	(0.01)				(0.01)			
2012-2013	0.05***				0.05***			
	(0.01)				(0.01)			
2009-2010	-0.07***				-0.07***			
	(0.01)				(0.01)			
Segregated*ESL Cert					-0.09*	-0.10*	0.01	0.03
					(0.04)	(0.04)	(0.02)	(0.03)

Singleton*ESL Cert					-0.00	-0.02	-0.09	-0.06
					(0.05)	(0.05)	(0.05)	(0.06)
Segregated*El Exp					-0.13***	-0.14***	-0.08***	-0.06**
					(0.04)	(0.03)	(0.02)	(0.02)
Singleton*El Exp					0.02	0.02	0.01	0.01
					(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.16	-0.11	0.07	0.99***	0.17	-0.10	0.08	0.99***
	(0.09)	(0.14)	(0.15)	(0.24)	(0.10)	(0.14)	(0.15)	(0.24)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.46	0.42	0.34	0.40	0.46	0.42	0.34	0.40
F	1087.48	1157.34	900.50	718.95	1021.44	1076.73	830.95	657.18
Observations	147913	147913	147913	147913	147913	147913	147913	147913

Table B. 21 ***Full Results of Regression on Std. ELA Achievement, CELs, ES***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.09**	-0.08***	0.03	0.02	-0.04	-0.08*	0.02	0.02
	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)
Singleton	0.02	0.02*	-0.02	-0.02	0.02	0.02	-0.02	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
ESL Cert	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.03	-0.03
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
El Exp	-0.01	-0.01	0.02*	0.02*	-0.01	-0.01	0.03*	0.03*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.48***	0.46***	-0.25***	-0.24***	0.48***	0.46***	-0.25***	-0.24***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	-0.08***	-0.08***	-0.20***	-0.22***	-0.08***	-0.08***	-0.20***	-0.22***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
exiter	-0.32***	-0.29***			-0.32***	-0.29***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.05***	0.05***			0.05***	0.05***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	-0.01*	-0.01			-0.01*	-0.01		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.03	-0.01			0.03	-0.01		
	(0.05)	(0.05)			(0.05)	(0.05)		
Asian	-0.05**	-0.04**			-0.05**	-0.04**		
	(0.02)	(0.02)			(0.02)	(0.02)		
Black	-0.02	-0.02			-0.02	-0.02		
	(0.02)	(0.02)			(0.02)	(0.02)		
Other Race	0.01	0.00			0.01	0.00		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.10***	-0.11***	0.13***	0.12***	-0.10***	-0.11***	0.13***	0.12***
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)
Gifted	0.43***	0.43***	0.21***	0.16***	0.43***	0.43***	0.21***	0.16***
	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)	(0.04)	(0.04)
Moved in Year	-0.20***	-0.20***	-0.04*	-0.05**	-0.20***	-0.20***	-0.03*	-0.05**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Summer Move	0.06***	0.06***	-0.03**	-0.26***	0.06***	0.06***	-0.03**	-0.26***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.10*	-0.38***	-0.15***	-0.28***	-0.10*	-0.38***	-0.15***	-0.28***
	(0.04)	(0.03)	(0.02)	(0.02)	(0.04)	(0.03)	(0.02)	(0.02)
Days Absent	-0.00***	-0.00***	-0.00	-0.00	-0.00***	-0.00***	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	-0.06*	-0.07**	-0.39*	-0.22	-0.07*	-0.07**	-0.39*	-0.22
	(0.03)	(0.03)	(0.16)	(0.15)	(0.03)	(0.03)	(0.16)	(0.15)
Over Age	-0.05***	-0.06***	0.45***	0.37***	-0.05***	-0.06***	0.45***	0.37***
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)
Free Lunch	-0.10***	-0.09***			-0.10***	-0.09***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	0.09	-0.63	-5.54***	-7.70***	0.16	-0.64	-5.69***	-7.79***
	(1.02)	(1.15)	(0.95)	(0.92)	(1.03)	(1.16)	(0.95)	(0.93)
Evenness of REL	4.69**	3.52*	11.13***	10.43***	4.70**	3.56*	11.38***	10.61***
	(1.48)	(1.65)	(1.52)	(1.56)	(1.49)	(1.66)	(1.53)	(1.57)
% Teacher Same Race	0.35	0.69	1.62*	0.51	0.37	0.70	1.61*	0.50
	(0.59)	(0.52)	(0.74)	(0.85)	(0.59)	(0.52)	(0.74)	(0.85)
School % El	0.57	-2.24*	12.06***	28.36***	0.58	-2.24*	12.16***	28.40***
	(0.53)	(0.92)	(1.11)	(1.15)	(0.53)	(0.92)	(1.10)	(1.15)
School % ESL Cred	-1.17	0.02	-4.35***	-2.40**	-1.13	0.01	-4.44***	-2.57**
	(0.71)	(0.81)	(0.86)	(0.83)	(0.69)	(0.80)	(0.85)	(0.83)

Bilingual/Heritage	-0.01		0.04		-0.01		0.04	
	(0.02)		(0.06)		(0.02)		(0.06)	
New Destination School	-0.02*		-0.14***		-0.02*		-0.14***	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Growing	-0.02		-0.18***		-0.02		-0.18***	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Stable	-0.01		-0.10*		-0.01		-0.10*	
	(0.01)		(0.05)		(0.01)		(0.05)	
rural	-0.01	-0.04***	-0.01	-0.02	-0.01	-0.04***	-0.01	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.04*		-0.06		-0.04*		-0.06	
	(0.02)		(0.07)		(0.02)		(0.07)	
Class Size	0.00	0.00**	0.00	-0.00	0.00	0.00**	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	-0.06***	-0.12***	-0.04***	-0.02*	-0.06***	-0.12***	-0.03***	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.03**	-0.03**	-0.02**	-0.01	-0.03**	-0.03**	-0.02**	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.02	-0.01	-0.03	-0.02	0.02	-0.01	-0.03	-0.02
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Teacher Avg. Test Score	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
School Size	-0.01	-0.07**	-0.20***	-0.40***	-0.01	-0.07**	-0.20***	-0.40***
	(0.01)	(0.03)	(0.02)	(0.04)	(0.01)	(0.03)	(0.02)	(0.04)
School Size Sq	0.00	0.00	0.01***	0.02***	0.00	0.00	0.01***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	-0.00	-0.03***	-0.03***	0.00	-0.00	-0.03***	-0.03***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01***	0.01	-0.00	-0.00	0.01***	0.01	-0.01	-0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
% Full Credential	-0.13	-0.18	1.32***	1.31***	-0.13	-0.19	1.32***	1.31***
	(0.15)	(0.19)	(0.19)	(0.20)	(0.15)	(0.19)	(0.19)	(0.20)
% NBC	0.07	0.31**	2.34***	3.08***	0.07	0.31**	2.34***	3.09***
	(0.05)	(0.10)	(0.09)	(0.11)	(0.05)	(0.10)	(0.09)	(0.11)
% Adv Degree	-0.06	-0.17*	-0.46***	-0.66***	-0.06	-0.16*	-0.46***	-0.65***
	(0.05)	(0.07)	(0.07)	(0.08)	(0.05)	(0.07)	(0.07)	(0.08)
School % Minority	-0.04	0.00	0.06	0.20	-0.04	0.00	0.06	0.20
	(0.03)	(0.10)	(0.07)	(0.12)	(0.03)	(0.10)	(0.07)	(0.12)
School % Free Lunch	-0.05	0.17***	0.67***	0.49***	-0.05	0.17***	0.67***	0.49***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)
2010-2011	0.03**				0.03**			
	(0.01)				(0.01)			
2011-2012	0.05**				0.05**			
	(0.02)				(0.02)			
2012-2013	0.15***				0.15***			
	(0.02)				(0.02)			
2009-2010	0.00				0.00			
	(0.01)				(0.01)			
Segregated*ESL Cert					-0.02	0.01	0.10*	0.07
					(0.06)	(0.05)	(0.05)	(0.05)

Singleton*ESL Cert					-0.06	-0.08	-0.08	-0.10
					(0.06)	(0.06)	(0.08)	(0.09)
Segregated*El Exp					-0.11	-0.03	-0.13**	-0.10*
					(0.06)	(0.04)	(0.05)	(0.05)
Singleton*El Exp					-0.00	-0.00	-0.01	-0.00
					(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.52**	0.67**	0.98***	2.31***	0.52**	0.67**	0.97***	2.30***
	(0.17)	(0.24)	(0.22)	(0.28)	(0.17)	(0.24)	(0.22)	(0.28)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.41	0.39	0.34	0.40	0.41	0.39	0.34	0.40
F	788.02	867.75	.	.	740.38	806.95	.	.
Observations	70368.00	70368.00	70368.00	70368.00	70368.00	70368.00	70368.00	70368.00

Table B. 22 *Full Results of Regression on Std. ELA Achievement, CELs, MS*

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.22***	-0.22***	-0.01	0.00	-0.14**	-0.14*	0.03	0.03
	(0.05)	(0.05)	(0.02)	(0.02)	(0.05)	(0.06)	(0.03)	(0.03)
Singleton	0.07***	0.08***	0.03**	0.00	0.06***	0.07***	0.02	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.10**	-0.11**	-0.02	-0.02	-0.07	-0.08*	-0.00	-0.01
	(0.04)	(0.04)	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)
El Exp	0.00	-0.02	0.04***	0.03***	-0.00	-0.02	0.04***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.54***	0.52***	-0.18***	-0.19***	0.54***	0.52***	-0.18***	-0.19***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Years CEL	-0.10***	-0.11***	-0.22***	-0.33***	-0.10***	-0.11***	-0.22***	-0.33***
	(0.00)	(0.00)	(0.02)	(0.02)	(0.00)	(0.00)	(0.02)	(0.02)
exiter	-0.29***	-0.29***			-0.29***	-0.29***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.05***	0.04***			0.05***	0.04***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Male	0.01	0.00			0.01	0.00		
	(0.01)	(0.01)			(0.01)	(0.01)		
White	0.03	0.07			0.03	0.07		
	(0.05)	(0.04)			(0.05)	(0.04)		
Asian	-0.06*	-0.06**			-0.06*	-0.06**		
	(0.02)	(0.02)			(0.02)	(0.02)		
Black	-0.06*	-0.03			-0.06*	-0.03		
	(0.03)	(0.02)			(0.03)	(0.02)		
Other Race	0.03	0.04			0.03	0.04		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.16***	-0.17***	-0.02	-0.00	-0.16***	-0.17***	-0.02	-0.00
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)
Gifted	0.45***	0.46***	0.06	0.02	0.45***	0.46***	0.06	0.02
	(0.02)	(0.02)	(0.06)	(0.06)	(0.02)	(0.02)	(0.06)	(0.06)
Moved in Year	-0.24***	-0.24***	-0.00	-0.01	-0.24***	-0.24***	-0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Summer Move	-0.01	-0.00	-0.03*	-0.20***	-0.01	-0.00	-0.03*	-0.20***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Forced Move	-0.49***	-0.52***	-0.42***	-0.36***	-0.49***	-0.52***	-0.42***	-0.36***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Days Absent	-0.00***	-0.00***	0.00	-0.00*	-0.00***	-0.00***	0.00	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	-0.07**	-0.08***	-0.55***	-0.48***	-0.07**	-0.08***	-0.55***	-0.48***
	(0.02)	(0.02)	(0.12)	(0.11)	(0.02)	(0.02)	(0.12)	(0.11)
Over Age	-0.09***	-0.09***	0.30***	0.25***	-0.09***	-0.09***	0.30***	0.25***
	(0.01)	(0.01)	(0.03)	(0.04)	(0.01)	(0.01)	(0.03)	(0.04)
Free Lunch	-0.02**	0.00			-0.02**	0.01		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	2.89***	0.14	4.83***	1.16	2.92***	0.14	4.80***	1.11
	(0.67)	(0.87)	(0.57)	(0.61)	(0.67)	(0.86)	(0.57)	(0.61)
Evenness of REL	3.01	-0.74	16.84***	6.68**	2.87	-0.82	16.82***	6.63**
	(3.33)	(3.52)	(2.25)	(2.24)	(3.31)	(3.54)	(2.25)	(2.24)
% Teacher Same Race	0.51	0.02	0.02	0.44	0.51	0.03	0.01	0.43
	(0.57)	(0.49)	(0.51)	(0.55)	(0.57)	(0.49)	(0.51)	(0.55)
School % El	0.32	-0.82	10.85***	28.38***	0.30	-0.80	10.84***	28.40***
	(0.87)	(1.64)	(0.95)	(1.21)	(0.87)	(1.63)	(0.95)	(1.21)
School % ESL Cred	3.14***	2.19*	2.85***	0.59	3.12**	2.18*	2.86***	0.59
	(0.94)	(1.08)	(0.62)	(0.65)	(0.95)	(1.08)	(0.62)	(0.65)
Bilingual/Heritage	-0.00		-0.15***		-0.00		-0.15***	

	(0.02)		(0.03)		(0.02)		(0.03)	
New Destination School	-0.04**		-0.10***		-0.04**		-0.10***	
	(0.02)		(0.02)		(0.02)		(0.02)	
Established and Growing	-0.04		-0.22***		-0.04		-0.22***	
	(0.02)		(0.02)		(0.02)		(0.02)	
Established and Stable	-0.00		-0.12***		-0.00		-0.12***	
	(0.02)		(0.03)		(0.02)		(0.03)	
rural	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.07*		-0.13*		-0.06*		-0.13*	
	(0.03)		(0.06)		(0.03)		(0.06)	
Class Size	0.01***	0.01***	-0.00	-0.00**	0.01***	0.01***	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	-0.11***	-0.14***	0.02*	0.03***	-0.11***	-0.14***	0.02*	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	0.00**	0.00***	0.00**	0.00**	0.00**	0.00***	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	0.00	0.00	-0.03***	-0.02*	0.00	0.00	-0.03***	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	-0.07	-0.06	0.03	0.04	-0.06	-0.06	0.04	0.05
	(0.04)	(0.04)	(0.03)	(0.02)	(0.05)	(0.04)	(0.03)	(0.02)
Advanced	0.30***	0.33***	-0.05	-0.05	0.30***	0.33***	-0.05	-0.05
	(0.03)	(0.04)	(0.02)	(0.03)	(0.03)	(0.04)	(0.02)	(0.03)
Remedial	-0.16***	-0.17***	-0.00	0.02	-0.17***	-0.18***	-0.01	0.01
	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
Teacher Avg. Test Score	0.00	-0.01	0.00	0.00	0.00	-0.01	0.00	0.00
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
School Size	0.01*	-0.02	-0.04***	0.01	0.01*	-0.02	-0.04***	0.01
	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)
School Size Sq	-0.00	0.00***	0.00***	0.00***	-0.00	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	0.00***	-0.00***	-0.01***	0.00	0.00***	-0.00***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01*	0.03**	0.01	0.00	0.01*	0.03**	0.01	0.00
	(0.00)	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)	(0.02)
% Full Credential	0.05	-0.05	0.60***	0.70***	0.05	-0.06	0.60***	0.69***
	(0.11)	(0.10)	(0.08)	(0.09)	(0.11)	(0.10)	(0.08)	(0.09)
% NBC	0.31**	0.21	-0.05	0.32	0.31**	0.21	-0.05	0.32
	(0.10)	(0.27)	(0.13)	(0.42)	(0.10)	(0.27)	(0.13)	(0.42)
% Adv Degree	-0.07	-0.10	-0.44***	0.26	-0.07	-0.10	-0.44***	0.26
	(0.07)	(0.23)	(0.09)	(0.28)	(0.07)	(0.23)	(0.09)	(0.28)
School % Minority	-0.08*	0.18	0.04	0.55***	-0.08*	0.19	0.05	0.55***
	(0.04)	(0.13)	(0.06)	(0.13)	(0.04)	(0.13)	(0.06)	(0.13)
School % Free Lunch	-0.06**	0.03	0.14***	0.10***	-0.06**	0.03	0.14***	0.10***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
2010-2011	-0.06***				-0.06***			
	(0.01)				(0.01)			
2011-2012	-0.07***				-0.07***			
	(0.02)				(0.02)			
2012-2013	0.02				0.02			
	(0.02)				(0.02)			
2009-2010	-0.14***				-0.14***			
	(0.02)				(0.02)			
Segregated*ESL Cert					-0.10	-0.08	-0.05	-0.02
					(0.06)	(0.06)	(0.03)	(0.03)
Singleton*ESL Cert					0.05	0.03	-0.08	-0.03
					(0.08)	(0.08)	(0.07)	(0.07)
Segregated*El Exp					-0.04	-0.06	-0.02	-0.03

					(0.04)	(0.04)	(0.02)	(0.03)
Singleton*El Exp					0.02	0.02	0.01	0.01
					(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.08	-0.19	0.01	0.03	0.08	-0.19	0.00	0.02
	(0.12)	(0.23)	(0.14)	(0.27)	(0.12)	(0.23)	(0.14)	(0.27)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.45	0.44	0.38	0.44	0.45	0.44	0.38	0.44
F	900.84	1106.99	482.39	548.20	853.15	1024.58	443.89	498.70
Observations	77545.00	77545.00	77545.00	77545.00	77545.00	77545.00	77545.00	77545.00

Table B. 23 ***Full Results of Regression on Std. ELA Achievement, RELs, Pooled***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.03	-0.04	-0.03	-0.05	-0.03	-0.03	0.01	-0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)
Singleton	0.01*	0.01	-0.01	-0.01	0.00	0.00	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	0.00	0.01	-0.00	0.00	-0.00	0.00	-0.01	-0.01
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
El Exp	0.01*	0.01	0.03***	0.02***	0.01	0.01	0.03***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.60***	0.59***	-0.18***	-0.31***	0.60***	0.59***	-0.18***	-0.31***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Years CEL	-0.05***	-0.04***			-0.05***	-0.04***		
	(0.00)	(0.00)			(0.00)	(0.00)		
exiter	-0.17***	-0.17***			-0.17***	-0.17***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.00	-0.00			0.00	-0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	-0.00	0.00			-0.00	0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.08**	0.07**			0.08**	0.07**		
	(0.02)	(0.02)			(0.02)	(0.02)		
Asian	0.06***	0.05***			0.06***	0.05***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Black	0.05***	0.05***			0.05***	0.05***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Other Race	0.03**	0.03**			0.03**	0.03**		
	(0.01)	(0.01)			(0.01)	(0.01)		
Special Needs	-0.10***	-0.10***	-0.05*	-0.06*	-0.10***	-0.10***	-0.05*	-0.06*
	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)	(0.03)
Gifted	0.16***	0.17***	0.10***	0.09***	0.16***	0.17***	0.10***	0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Moved in Year	-0.01	-0.01	0.01	-0.03**	-0.01	-0.01	0.01	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Summer Move	-0.05***	-0.04***	-0.04***	-0.21***	-0.05***	-0.04***	-0.04***	-0.21***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.41***	-0.46***	-0.29***	-0.24***	-0.41***	-0.46***	-0.29***	-0.24***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Days Absent	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.10***	0.09***	0.26	-0.73***	0.10***	0.09***	0.27	-0.73***
	(0.01)	(0.01)	(0.31)	(0.01)	(0.01)	(0.01)	(0.31)	(0.01)
Over Age	-0.05***	-0.05***	0.20***	0.43***	-0.05***	-0.05***	0.20***	0.43***
	(0.00)	(0.00)	(0.05)	(0.06)	(0.00)	(0.00)	(0.05)	(0.06)

Free Lunch	-0.04***	-0.04***			-0.04***	-0.04***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Evenness of CEL	0.24	-0.52	1.39***	-1.19*	0.23	-0.53	1.38***	-1.20*
	(0.37)	(0.54)	(0.30)	(0.48)	(0.37)	(0.54)	(0.30)	(0.48)
Evenness of REL	0.78	1.57	4.74***	2.19*	0.79	1.58	4.75***	2.19*
	(0.98)	(1.07)	(0.80)	(1.08)	(0.98)	(1.07)	(0.80)	(1.08)
% Teacher Same Race	-0.16	-0.19	0.31	0.26	-0.16	-0.19	0.31	0.27
	(0.28)	(0.28)	(0.29)	(0.39)	(0.28)	(0.28)	(0.29)	(0.39)
School % El	-0.44	-0.09	2.48***	15.44***	-0.42	-0.08	2.48***	15.44***
	(0.33)	(0.75)	(0.42)	(0.84)	(0.33)	(0.75)	(0.42)	(0.84)
School % ESL Cred	0.41	0.17	0.41	-0.96*	0.42	0.17	0.42	-0.97*
	(0.54)	(0.55)	(0.34)	(0.47)	(0.54)	(0.55)	(0.34)	(0.47)
Bilingual/Heritage	-0.00		-0.05***		-0.00		-0.05***	
	(0.01)		(0.01)		(0.01)		(0.01)	
New Destination School	-0.02*		-0.04***		-0.02*		-0.04***	
	(0.01)		(0.01)		(0.01)		(0.01)	
Established and Growing	-0.02*		-0.05***		-0.02*		-0.05***	
	(0.01)		(0.01)		(0.01)		(0.01)	
Established and Stable	-0.02		-0.03***		-0.02		-0.03***	
	(0.01)		(0.01)		(0.01)		(0.01)	
rural	-0.02***	-0.01	-0.01*	-0.02*	-0.02***	-0.01	-0.01*	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.02		-0.10**		-0.02		-0.10**	
	(0.01)		(0.03)		(0.01)		(0.03)	
Class Size	0.00	0.00*	0.00	0.00	0.00	0.00*	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.08***	0.08***	0.05***	0.01*	0.08***	0.08***	0.05***	0.01*
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Years Experience	0.00*	0.00**	0.00***	0.00***	0.00*	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.00	-0.01	-0.01**	-0.02**	-0.00	-0.01	-0.01**	-0.02**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
ESL Course	-0.06**	-0.05**	-0.05**	-0.05**	-0.06**	-0.05**	-0.05**	-0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Advanced	0.08***	0.07***	0.02	-0.01	0.08***	0.07***	0.02	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Remedial	-0.04	-0.04	0.01	0.05	-0.04	-0.04	0.01	0.05
	(0.05)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.03)	(0.03)
Teacher Avg. Test Score	0.00	-0.00	-0.00	0.00	0.00	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
School Size	0.00	-0.02**	-0.04***	-0.09***	0.00	-0.02**	-0.04***	-0.09***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
School Size Sq	-0.00	0.00	0.00***	0.00***	-0.00	0.00	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	-0.00***	-0.01***	-0.02***	0.00	-0.00***	-0.01***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Title 3 Funds	0.00	-0.00	0.00	-0.01	0.00	-0.00	0.00	-0.01
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
% Full Credential	-0.21**	-0.09	0.22***	0.53***	-0.21**	-0.09	0.22***	0.53***
	(0.06)	(0.08)	(0.06)	(0.09)	(0.06)	(0.08)	(0.06)	(0.09)
% NBC	0.07	0.76***	0.61***	2.38***	0.07	0.76***	0.61***	2.38***
	(0.04)	(0.08)	(0.04)	(0.10)	(0.04)	(0.08)	(0.04)	(0.10)
% Adv Degree	-0.04	-0.01	-0.11***	-0.02	-0.04	-0.01	-0.11***	-0.02
	(0.04)	(0.07)	(0.03)	(0.08)	(0.04)	(0.07)	(0.03)	(0.08)
School % Minority	0.01	0.07	0.14***	0.34***	0.01	0.07	0.14***	0.34***
	(0.02)	(0.08)	(0.03)	(0.08)	(0.02)	(0.08)	(0.03)	(0.08)
School % Free Lunch	0.04*	0.07***	0.29***	0.16***	0.04*	0.07***	0.29***	0.16***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Elementary	0.25***	0.56***	0.45***	0.80***	0.25***	0.56***	0.45***	0.80***
	(0.01)	(0.04)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)
2010-2011	0.07***				0.07***			
	(0.01)				(0.01)			
2011-2012	0.09***				0.09***			
	(0.01)				(0.01)			
2012-2013	0.15***				0.15***			
	(0.01)				(0.01)			
2009-2010	0.00				0.00			
	(0.01)				(0.01)			
Segregated*ESL Cert					0.05	0.03	-0.02	-0.05
					(0.06)	(0.07)	(0.07)	(0.08)
Singleton*ESL Cert					0.06	0.05	0.11**	0.07
					(0.04)	(0.04)	(0.04)	(0.04)
Segregated*El Exp					-0.02	-0.03	-0.06	0.00
					(0.05)	(0.05)	(0.06)	(0.06)
Singleton*El Exp					0.02	0.01	0.00	-0.01
					(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.28***	0.19	0.18**	0.54***	0.28***	0.19	0.18**	0.54***
	(0.07)	(0.13)	(0.07)	(0.14)	(0.07)	(0.13)	(0.07)	(0.14)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.58	0.54	0.36	0.40	0.58	0.54	0.36	0.40
F	1758.56	1883.99	871.97	.	1652.51	1752.65	802.68	.
Observations	119089.00	119089.00	119089.00	119089.00	119089.00	119089.00	119089.00	119089.00

Table B. 24 ***Full Results of Regression on Std. ELA Achievement, RELs, ES***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.04	-0.06	-0.01	-0.02	-0.01	-0.01	0.02	-0.00
	(0.03)	(0.03)	(0.03)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Singleton	0.01	0.00	-0.03**	-0.02*	0.02*	0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.02	-0.01	0.02	0.02	-0.02	-0.01	0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
El Exp	0.01	0.01	0.02**	0.02*	0.01	0.02*	0.03***	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.55***	0.55***	-0.36***	-0.36***	0.55***	0.55***	-0.36***	-0.36***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	-0.10***	-0.07***			-0.10***	-0.07***		
	(0.00)	(0.00)			(0.00)	(0.00)		
exiter	-0.27***	-0.24***			-0.27***	-0.24***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.03***	0.02***			0.03***	0.02***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	0.00	0.00			0.00	0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.03	0.04			0.03	0.04		
	(0.03)	(0.03)			(0.03)	(0.03)		
Asian	0.03***	0.03***			0.03***	0.03***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Black	0.04**	0.04**			0.04**	0.04**		
	(0.01)	(0.01)			(0.01)	(0.01)		
Other Race	0.03	0.03			0.03	0.03		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.07***	-0.07***	-0.08*	-0.07	-0.07***	-0.08***	-0.08*	-0.07
	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.04)	(0.04)
Gifted	0.17***	0.19***	0.15***	0.14***	0.17***	0.19***	0.15***	0.14***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Moved in Year	-0.02	-0.02	-0.03	-0.04*	-0.02	-0.02	-0.03	-0.04*
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Summer Move	-0.02*	-0.03***	-0.04***	-0.21***	-0.02*	-0.03***	-0.04***	-0.21***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.04	-0.32***	-0.13***	-0.17***	-0.04	-0.32***	-0.13***	-0.17***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Days Absent	-0.00***	-0.00***	-0.00	-0.00	-0.00***	-0.00***	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.08***	0.07**	-0.76***	-0.66***	0.08***	0.07**	-0.76***	-0.66***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Over Age	-0.05***	-0.05***	0.58***	0.61***	-0.05***	-0.05***	0.58***	0.61***
	(0.01)	(0.01)	(0.07)	(0.07)	(0.01)	(0.01)	(0.07)	(0.07)
Free Lunch	-0.04***	-0.04***			-0.04***	-0.04***		

	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	-0.15	-1.51	-6.46***	-6.85***	-0.16	-1.53	-6.49***	-6.87***
	(0.68)	(0.81)	(0.86)	(0.91)	(0.68)	(0.82)	(0.86)	(0.91)
Evenness of REL	1.35	1.97	6.16***	4.07*	1.42	2.05	6.26***	4.13**
	(1.07)	(1.24)	(1.52)	(1.59)	(1.07)	(1.24)	(1.52)	(1.59)
% Teacher Same Race	0.29	0.13	0.79	0.12	0.28	0.13	0.79	0.12
	(0.32)	(0.38)	(0.56)	(0.59)	(0.32)	(0.38)	(0.56)	(0.59)
School % El	-0.15	1.05	7.26***	14.76***	-0.16	1.06	7.25***	14.74***
	(0.29)	(0.92)	(0.87)	(1.17)	(0.29)	(0.92)	(0.87)	(1.17)
School % ESL Cred	0.13	1.19	-1.92**	-2.06**	0.15	1.19	-1.90**	-2.04**
	(0.43)	(0.82)	(0.72)	(0.78)	(0.43)	(0.82)	(0.72)	(0.79)
Bilingual/Heritage	0.02*		0.03		0.02*		0.03	
	(0.01)		(0.05)		(0.01)		(0.05)	
New Destination School	0.00		-0.11***		0.00		-0.11***	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Growing	-0.01		-0.09**		-0.01		-0.09**	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Stable	0.00		-0.13**		0.00		-0.13**	
	(0.01)		(0.04)		(0.01)		(0.04)	
rural	-0.02***	-0.03***	-0.04***	-0.03*	-0.02***	-0.03***	-0.04***	-0.03*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.00		-0.02		-0.00		-0.02	
	(0.01)		(0.09)		(0.01)		(0.09)	
Class Size	0.00**	0.00*	0.00*	0.00	0.00**	0.00*	0.00*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.03***	0.01	-0.02*	-0.02	0.03***	0.01	-0.02*	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	0.00*	0.00**	0.00***	0.00***	0.00*	0.00**	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.02*	-0.02**	-0.01	-0.01	-0.02*	-0.02*	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	-0.03	-0.05**	-0.02	-0.03	-0.03	-0.05**	-0.03	-0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Teacher Avg. Test Score	-0.00	-0.00	0.01	0.01	-0.00	-0.00	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
School Size	-0.01	-0.15***	-0.23***	-0.46***	-0.01	-0.15***	-0.23***	-0.46***
	(0.01)	(0.02)	(0.02)	(0.04)	(0.01)	(0.02)	(0.02)	(0.04)
School Size Sq	0.00	0.01***	0.01***	0.02***	0.00	0.01***	0.01***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	-0.01***	-0.02***	-0.03***	0.00	-0.01***	-0.02***	-0.03***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.00**	-0.01	-0.00	-0.01	0.00**	-0.01	-0.00	-0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
% Full Credential	0.10	0.31	1.39***	1.42***	0.10	0.31	1.39***	1.42***
	(0.12)	(0.16)	(0.18)	(0.21)	(0.12)	(0.16)	(0.18)	(0.21)

% NBC	-0.04	0.70***	2.07***	2.85***	-0.04	0.70***	2.07***	2.85***
	(0.03)	(0.08)	(0.08)	(0.10)	(0.03)	(0.08)	(0.08)	(0.10)
% Adv Degree	-0.02	-0.14*	-0.30***	-0.38***	-0.02	-0.13*	-0.30***	-0.38***
	(0.03)	(0.06)	(0.07)	(0.08)	(0.03)	(0.06)	(0.07)	(0.08)
School % Minority	-0.03	-0.10	0.15*	0.12	-0.03	-0.10	0.15*	0.13
	(0.02)	(0.09)	(0.07)	(0.13)	(0.02)	(0.09)	(0.07)	(0.13)
School % Free Lunch	0.03	0.28***	0.56***	0.44***	0.03	0.28***	0.56***	0.44***
	(0.02)	(0.03)	(0.03)	(0.04)	(0.02)	(0.03)	(0.03)	(0.04)
2010-2011	0.20***				0.20***			
	(0.01)				(0.01)			
2011-2012	0.32***				0.32***			
	(0.01)				(0.01)			
2012-2013	0.47***				0.47***			
	(0.02)				(0.02)			
2009-2010	0.07***				0.07***			
	(0.01)				(0.01)			
Segregated*ESL Cert					-0.02	-0.04	-0.06	-0.07
					(0.08)	(0.09)	(0.09)	(0.09)
Singleton*ESL Cert					0.02	0.02	0.04	0.04
					(0.06)	(0.07)	(0.08)	(0.08)
Segregated*El Exp					-0.05	-0.08	-0.04	-0.01
					(0.06)	(0.07)	(0.07)	(0.08)
Singleton*El Exp					-0.02	-0.02	-0.04*	-0.04*
					(0.01)	(0.01)	(0.02)	(0.02)
Constant	0.11	1.08***	1.09***	2.38***	0.11	1.08***	1.08***	2.37***
	(0.13)	(0.21)	(0.21)	(0.28)	(0.13)	(0.21)	(0.21)	(0.28)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.55	0.50	0.35	0.40	0.55	0.50	0.35	0.40
F	945.34	1020.03	.	.	891.92	955.09	.	.
Observations	54416.00	54416.00	54416.00	54416.00	54416.00	54416.00	54416.00	54416.00

Table B. 25 ***Full Results of Regression on Std. ELA Achievement, RELs, MS***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.05	-0.04	-0.08	-0.08	-0.16*	-0.12	-0.10	-0.11
	(0.04)	(0.04)	(0.05)	(0.06)	(0.08)	(0.08)	(0.12)	(0.13)
Singleton	0.01*	0.01	0.01	0.00	-0.01	-0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	0.03	0.03	0.03	0.00	0.02	0.02	0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
El Exp	0.01	0.00	0.03***	0.02*	-0.00	-0.00	0.03**	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.63***	0.62***	-0.28***	-0.30***	0.63***	0.62***	-0.28***	-0.30***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	-0.04***	-0.03***			-0.04***	-0.03***		
	(0.00)	(0.00)			(0.00)	(0.00)		
exiter	0.11***	0.08***			0.11***	0.08***		
	(0.02)	(0.02)			(0.02)	(0.01)		
mover	0.01	-0.00			0.01	-0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	-0.00	-0.00			-0.00	-0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.09**	0.09**			0.09**	0.09**		
	(0.03)	(0.03)			(0.03)	(0.03)		
Asian	0.08***	0.07***			0.08***	0.07***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Black	0.05**	0.05**			0.05**	0.05**		
	(0.02)	(0.02)			(0.02)	(0.02)		
Other Race	0.03*	0.03*			0.03*	0.03*		
	(0.01)	(0.01)			(0.01)	(0.01)		
Special Needs	-0.13***	-0.12***	-0.08	-0.05	-0.13***	-0.12***	-0.07	-0.05
	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.04)	(0.04)
Gifted	0.14***	0.16***	-0.01	-0.02	0.14***	0.16***	-0.01	-0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Moved in Year	0.00	-0.00	0.03*	-0.00	0.00	-0.00	0.03*	-0.00
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Summer Move	-0.09***	-0.07***	-0.06***	-0.19***	-0.09***	-0.07***	-0.06***	-0.19***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Forced Move	-0.44***	-0.47***	-0.32***	-0.31***	-0.44***	-0.47***	-0.32***	-0.31***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Days Absent	-0.00***	-0.00***	-0.00	-0.00*	-0.00***	-0.00***	-0.00	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.10***	0.09***	1.31***		0.10***	0.09***	1.30***	
	(0.01)	(0.01)	(0.09)		(0.01)	(0.01)	(0.09)	
Over Age	-0.06***	-0.06***	0.14	0.28***	-0.06***	-0.06***	0.14	0.28***
	(0.01)	(0.01)	(0.07)	(0.08)	(0.01)	(0.01)	(0.07)	(0.08)
Free Lunch	-0.04***	-0.04***			-0.04***	-0.04***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	0.62	0.05	3.08***	0.90	0.61	0.06	3.08***	0.90
	(0.42)	(0.56)	(0.55)	(0.57)	(0.42)	(0.55)	(0.55)	(0.57)
Evenness of REL	-2.50	-4.12	-0.61	-4.04	-2.52	-4.15	-0.52	-3.96
	(2.45)	(2.33)	(2.19)	(2.20)	(2.46)	(2.33)	(2.19)	(2.20)
% Teacher Same Race	-0.23	-0.44	0.30	0.20	-0.22	-0.44	0.31	0.21
	(0.41)	(0.40)	(0.49)	(0.51)	(0.41)	(0.40)	(0.49)	(0.51)
School % El	-0.27	2.10	3.76***	18.70***	-0.26	2.11	3.75***	18.66***
	(0.68)	(1.15)	(1.03)	(1.30)	(0.67)	(1.15)	(1.03)	(1.30)
School % ESL Cred	1.05	-0.47	2.64***	0.30	1.06	-0.46	2.64***	0.29
	(0.82)	(0.74)	(0.57)	(0.60)	(0.82)	(0.74)	(0.57)	(0.60)

Bilingual/Heritage	0.01		-0.12**		0.01		-0.12**	
	(0.02)		(0.04)		(0.02)		(0.04)	
New Destination School	-0.02		-0.06*		-0.03		-0.06*	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Growing	-0.01		-0.14***		-0.02		-0.14***	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Stable	-0.01		-0.13***		-0.01		-0.13***	
	(0.01)		(0.03)		(0.01)		(0.03)	
rural	-0.02	0.01	0.01	0.00	-0.02	0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.01		-0.07		-0.01		-0.07	
	(0.02)		(0.06)		(0.02)		(0.06)	
Class Size	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.10***	0.09***	0.04***	0.03***	0.10***	0.09***	0.04***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	0.00	0.00	0.00**	0.00*	0.00	0.00	0.00**	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	0.01	0.01	-0.01*	-0.01	0.01	0.01	-0.01*	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	-0.04	-0.02	-0.01	-0.01	-0.04	-0.02	-0.01	-0.01
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)
Advanced	0.02	0.03**	-0.03**	-0.02	0.02	0.03**	-0.03**	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Remedial	-0.02	-0.01	0.07*	0.07	-0.02	-0.01	0.07*	0.07
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Teacher Avg. Test Score	0.00	0.00	-0.00	-0.00	0.00	0.00	-0.00	-0.00
	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
School Size	0.00	0.01	-0.05***	0.05*	0.00	0.01	-0.05***	0.05*
	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)
School Size Sq	-0.00	0.00	0.00***	0.00***	-0.00	0.00	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	0.00	-0.01***	-0.01***	0.00	0.00	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.00	0.02	0.00	0.01	0.00	0.02	0.00	0.01
	(0.00)	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)	(0.02)
% Full Credential	-0.17*	0.03	0.39***	0.32**	-0.17*	0.03	0.39***	0.32**
	(0.07)	(0.09)	(0.09)	(0.10)	(0.07)	(0.09)	(0.09)	(0.10)
% NBC	0.01	-0.21	-0.30*	0.04	0.01	-0.21	-0.30*	0.04
	(0.06)	(0.27)	(0.14)	(0.34)	(0.06)	(0.27)	(0.14)	(0.34)
% Adv Degree	-0.09	-0.25	-0.43***	-0.18	-0.09	-0.25	-0.43***	-0.18
	(0.06)	(0.23)	(0.11)	(0.26)	(0.06)	(0.23)	(0.11)	(0.26)
School % Minority	-0.01	0.23*	0.19**	0.47***	-0.01	0.23*	0.19**	0.47***
	(0.03)	(0.09)	(0.06)	(0.11)	(0.03)	(0.09)	(0.06)	(0.11)
School % Free Lunch	-0.01	0.00	0.15***	0.08***	-0.01	0.00	0.16***	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2010-2011	-0.01				-0.01			
	(0.01)				(0.01)			
2011-2012	-0.01				-0.01			
	(0.01)				(0.01)			
2012-2013	0.06**				0.06**			
	(0.02)				(0.02)			
2009-2010	-0.02				-0.02			
	(0.02)				(0.02)			
Segregated*ESL Cert					0.09	0.07	-0.17	-0.06
					(0.09)	(0.08)	(0.14)	(0.14)
Singleton*ESL Cert					0.08	0.07	0.10*	0.09
					(0.05)	(0.05)	(0.05)	(0.05)

Segregated*El Exp					0.12	0.08	0.07	0.05
					(0.08)	(0.08)	(0.13)	(0.14)
Singleton*El Exp					0.03*	0.02	-0.01	-0.01
					(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.36***	-0.01	0.47***	-0.13	0.36***	-0.00	0.47***	-0.13
	(0.08)	(0.20)	(0.12)	(0.25)	(0.08)	(0.20)	(0.12)	(0.25)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.59	0.58	0.39	0.43	0.59	0.58	0.39	0.43
F	1241.65	1323.13	.	514.01	1191.51	1270.53	.	466.75
Observations	64673.00	64673.00	64673.00	64673.00	64673.00	64673.00	64673.00	64673.00

Table B. 26 ***Full Results of Regression on Std. Math Achievement, CELs, Pooled***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.39**	-0.11**	-0.24***	-0.00	-0.16	0.04	-0.01	0.09*
	(0.13)	(0.03)	(0.02)	(0.02)	(0.12)	(0.04)	(0.03)	(0.04)
Singleton	0.03**	0.05***	0.01*	0.00	0.03**	0.04***	0.02*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.02	-0.03	0.01	-0.01	-0.02	-0.02	0.02	-0.01
	(0.03)	(0.03)	(0.01)	(0.02)	(0.03)	(0.03)	(0.01)	(0.02)
El Exp	0.01	0.00	0.03***	0.03***	0.01	0.00	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.59***	0.58***	-0.07***	-0.18***	0.59***	0.58***	-0.07***	-0.18***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Years CEL	-0.10***	-0.09***	-1.07*	-0.52	-0.10***	-0.09***	-1.07*	-0.52
	(0.00)	(0.00)	(0.45)	(0.33)	(0.00)	(0.00)	(0.45)	(0.33)
exiter	-0.06***	-0.08***			-0.06***	-0.08***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.00	0.00			0.00	0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	0.01***	0.02***			0.01***	0.02***		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.05	0.09**			0.05	0.09**		
	(0.04)	(0.03)			(0.04)	(0.03)		
Asian	0.21***	0.20***			0.21***	0.20***		
	(0.02)	(0.02)			(0.02)	(0.02)		
Black	-0.06**	-0.04*			-0.06**	-0.04*		
	(0.02)	(0.01)			(0.02)	(0.01)		
Other Race	0.06***	0.06***			0.06***	0.06***		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.08***	-0.08***	0.06***	0.05**	-0.08***	-0.08***	0.05***	0.05**
	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.00)	(0.01)	(0.02)
Gifted	0.33***	0.33***	0.10**	0.12***	0.33***	0.33***	0.10**	0.12***
	(0.02)	(0.02)	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)	(0.04)
Moved in Year	-0.17***	-0.16***	-0.10***	-0.09***	-0.17***	-0.16***	-0.10***	-0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Summer Move	0.01	0.01	-0.00	-0.20***	0.01	0.01	-0.00	-0.20***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.39***	-0.43***	-0.28***	-0.24***	-0.39***	-0.43***	-0.27***	-0.24***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Days Absent	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.04**	0.03*	-0.47***	-0.49***	0.04**	0.03*	-0.47***	-0.49***
	(0.01)	(0.01)	(0.09)	(0.10)	(0.01)	(0.01)	(0.09)	(0.10)
Over Age	-0.05***	-0.06***	0.32***	0.32***	-0.05***	-0.06***	0.33***	0.32***
	(0.00)	(0.00)	(0.02)	(0.02)	(0.00)	(0.00)	(0.02)	(0.02)
Free Lunch	-0.05***	-0.04***			-0.05***	-0.04***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	0.03*	0.02	0.05***	0.01	0.03*	0.02	0.05***	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Evenness of REL	-0.01	0.01	0.43***	0.43***	-0.01	0.01	0.43***	0.43***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
% Teacher Same Race	0.01**	0.01*	0.01**	0.02***	0.01**	0.01*	0.01**	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
School % El	-0.00	0.06***	0.02***	0.28***	0.00	0.06***	0.02***	0.28***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
School % ESL Cred	-0.02***	-0.00	-0.03***	-0.02**	-0.02**	0.00	-0.02***	-0.02**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)

Bilingual/Heritage	-0.03		-0.03**		-0.03		-0.03**	
	(0.02)		(0.01)		(0.02)		(0.01)	
New Destination School	-0.02		-0.03**		-0.02		-0.03**	
	(0.02)		(0.01)		(0.02)		(0.01)	
Established and Growing	-0.02		-0.07***		-0.02		-0.07***	
	(0.02)		(0.01)		(0.02)		(0.01)	
Established and Stable	-0.01		-0.01		-0.01		-0.01	
	(0.02)		(0.01)		(0.02)		(0.01)	
rural	-0.01	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.03		-0.15***		-0.03		-0.15***	
	(0.02)		(0.03)		(0.02)		(0.03)	
Class Size	0.00	0.00**	-0.00***	-0.00***	0.00	0.00**	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	-0.01	-0.06***	-0.00	-0.01*	-0.01	-0.06***	-0.01	-0.01*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Years Experience	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.02**	-0.02*	-0.04***	-0.02***	-0.02*	-0.02*	-0.04***	-0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.13*	0.05	0.13***	0.03	0.13*	0.06	0.13***	0.03
	(0.06)	(0.05)	(0.02)	(0.03)	(0.06)	(0.06)	(0.03)	(0.03)
Advanced	0.15***	0.20***	-0.03**	-0.01	0.15***	0.20***	-0.03**	-0.01
	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)
Remedial	-0.04	-0.06**	-0.05*	-0.07**	-0.05	-0.07**	-0.06**	-0.07**
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Teacher Avg. Test Score	0.03***	0.02***	0.02***	0.02***	0.03***	0.02***	0.02***	0.02***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
School Size	-0.01*	-0.02*	-0.03***	-0.09***	-0.01*	-0.02*	-0.03***	-0.09***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
School Size Sq	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	0.00***	-0.01***	-0.02***	0.00	0.00***	-0.01***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01*	-0.01	0.00	-0.01	0.01*	-0.01	0.00	-0.01
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
% Full Credential	0.08	0.22*	0.50***	0.86***	0.08	0.22*	0.50***	0.86***
	(0.09)	(0.10)	(0.05)	(0.08)	(0.09)	(0.10)	(0.05)	(0.08)
% NBC	0.06	-0.46***	0.30***	2.21***	0.06	-0.46***	0.31***	2.22***
	(0.07)	(0.10)	(0.04)	(0.10)	(0.07)	(0.09)	(0.04)	(0.10)
% Adv Degree	-0.05	-0.08	-0.17***	-0.10	-0.05	-0.09	-0.18***	-0.10
	(0.05)	(0.08)	(0.03)	(0.08)	(0.05)	(0.08)	(0.03)	(0.08)
School % Minority	-0.05	-0.19	0.16***	0.02	-0.06	-0.18	0.16***	0.02
	(0.04)	(0.11)	(0.03)	(0.09)	(0.04)	(0.11)	(0.03)	(0.09)
School % Free Lunch	0.02	0.09***	0.23***	0.18***	0.02	0.09***	0.23***	0.18***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Elementary	0.20***	0.39***	0.46***	0.70***	0.20***	0.39***	0.46***	0.70***
	(0.02)	(0.04)	(0.01)	(0.02)	(0.01)	(0.04)	(0.01)	(0.02)
2010-2011	0.05***				0.05***			
	(0.01)				(0.01)			
2011-2012	0.07***				0.07***			
	(0.01)				(0.01)			
2012-2013	-0.06***				-0.06***			
	(0.02)				(0.02)			
2009-2010	0.04***				0.04***			
	(0.01)				(0.01)			
Segregated*ESL Cert					-0.14	-0.17*	-0.19***	-0.07
					(0.08)	(0.08)	(0.05)	(0.06)

Singleton*ESL Cert					0.07	0.06	0.00	0.11
					(0.07)	(0.06)	(0.09)	(0.12)
Segregated*El Exp					-0.30***	-0.18***	-0.30***	-0.13**
					(0.06)	(0.05)	(0.04)	(0.04)
Singleton*El Exp					0.00	0.02	-0.01	-0.01
					(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.33**	0.16	3.43	1.88	0.33**	0.15	3.46	1.90
	(0.10)	(0.15)	(1.78)	(1.30)	(0.10)	(0.15)	(1.78)	(1.31)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.50	0.47	0.32	0.37	0.50	0.47	0.32	0.37
F	1618.38	1735.66	.	.	1536.43	1635.83	.	.
Observations	157585.00	157585.00	157585.00	157585.00	157585.00	157585.00	157585.00	157585.00

Table B. 27 ***Full Results of Regression on Std. Math Achievement, CELs, ES***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.38*	-0.07	-0.08	0.08	-0.01	0.06	0.39***	0.34***
	(0.16)	(0.07)	(0.05)	(0.05)	(0.13)	(0.09)	(0.07)	(0.08)
Singleton	0.02*	0.05***	0.03*	0.03	0.01	0.02	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
ESL Cert	0.00	-0.00	-0.00	-0.01	0.02	-0.00	0.01	-0.01
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
El Exp	-0.00	-0.01	0.00	0.00	-0.00	-0.02*	0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.58***	0.57***	-0.22***	-0.22***	0.58***	0.57***	-0.22***	-0.22***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	-0.08***	-0.08***	0.10	-0.17***	-0.08***	-0.08***	0.09	-0.17***
	(0.00)	(0.00)	(0.11)	(0.01)	(0.00)	(0.00)	(0.11)	(0.01)
exiter	-0.09***	-0.18***			-0.09***	-0.18***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.04***	0.04***			0.04***	0.04***		
	(0.01)	(0.00)			(0.01)	(0.00)		
Male	0.03***	0.03***			0.03***	0.03***		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	-0.01	0.04			0.00	0.04		
	(0.07)	(0.05)			(0.07)	(0.05)		
Asian	0.19***	0.18***			0.19***	0.18***		
	(0.02)	(0.02)			(0.02)	(0.02)		
Black	-0.08**	-0.05**			-0.08**	-0.05**		
	(0.03)	(0.02)			(0.03)	(0.02)		
Other Race	0.03	0.03			0.03	0.03		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.09***	-0.10***	0.07**	0.07**	-0.09***	-0.10***	0.07**	0.06**
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Gifted	0.35***	0.34***	0.13**	0.12**	0.35***	0.34***	0.13**	0.12**
	(0.02)	(0.02)	(0.04)	(0.05)	(0.02)	(0.02)	(0.04)	(0.05)
Moved in Year	-0.17***	-0.15***	-0.08***	-0.09***	-0.17***	-0.15***	-0.07***	-0.09***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Summer Move	0.03***	0.03**	-0.02*	-0.19***	0.03***	0.03**	-0.02*	-0.19***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.11***	-0.37***	-0.15***	-0.20***	-0.11***	-0.37***	-0.15***	-0.20***
	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)	(0.04)	(0.02)	(0.02)
Days Absent	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.05	0.03	-0.51***	-0.49***	0.05	0.03	-0.50***	-0.49***
	(0.03)	(0.03)	(0.12)	(0.12)	(0.03)	(0.03)	(0.13)	(0.12)
Over Age	-0.04***	-0.05***	0.40***	0.38***	-0.04***	-0.05***	0.40***	0.38***
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)
Free Lunch	-0.10***	-0.09***			-0.10***	-0.09***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	0.01	0.03	0.10***	0.03	0.01	0.02	0.09***	0.03
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Evenness of REL	0.03	0.10**	0.91***	0.72***	0.02	0.10**	0.91***	0.72***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
% Teacher Same Race	0.02	0.01	0.01*	0.01	0.02	0.01	0.01*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
School % El	0.00	0.01	0.08***	0.27***	0.01	0.01	0.09***	0.27***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
School % ESL Cred	-0.04**	-0.00	-0.08***	-0.02*	-0.03**	-0.00	-0.07***	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Bilingual/Heritage	-0.03		-0.00		-0.03		-0.01	
	(0.02)		(0.05)		(0.02)		(0.05)	
New Destination School	-0.01		-0.07**		-0.02		-0.09***	
	(0.02)		(0.03)		(0.02)		(0.03)	
Established and Growing	-0.02		-0.12***		-0.03		-0.14***	
	(0.02)		(0.03)		(0.02)		(0.03)	
Established and Stable	-0.02		-0.08*		-0.02		-0.09*	
	(0.02)		(0.04)		(0.02)		(0.04)	
rural	-0.00	-0.02	-0.00	-0.00	-0.00	-0.02	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	0.00		-0.12		0.01		-0.11	
	(0.02)		(0.07)		(0.02)		(0.07)	
Class Size	-0.00	0.00	-0.00	-0.01***	-0.00	0.00	-0.00	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	-0.04**	-0.11***	0.01	0.01	-0.04**	-0.11***	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.02	-0.02	-0.01	-0.00	-0.02	-0.02	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.11	-0.00	-0.11	-0.10	0.14*	-0.02	-0.11	-0.09
	(0.07)	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.07)	(0.07)
Teacher Avg. Test Score	0.02**	0.02*	0.01	0.01	0.02**	0.02*	0.01	0.01
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
School Size	0.04*	-0.02	-0.07***	-0.28***	0.03	-0.02	-0.08***	-0.28***
	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)	(0.04)
School Size Sq	-0.00	0.00	0.00	0.01***	-0.00	0.00	0.00	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00***	0.00***	-0.02***	-0.02***	0.00***	0.00***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01*	-0.03**	-0.01	-0.01	0.01*	-0.03**	-0.01	-0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
% Full Credential	-0.13	-0.02	1.23***	1.23***	-0.12	-0.02	1.20***	1.21***
	(0.20)	(0.20)	(0.17)	(0.18)	(0.20)	(0.20)	(0.17)	(0.18)
% NBC	0.03	-0.03	1.90***	2.66***	0.03	-0.03	1.90***	2.67***
	(0.07)	(0.10)	(0.08)	(0.10)	(0.07)	(0.10)	(0.08)	(0.10)
% Adv Degree	-0.04	-0.16*	-0.45***	-0.58***	-0.04	-0.17*	-0.46***	-0.59***
	(0.06)	(0.07)	(0.06)	(0.08)	(0.06)	(0.07)	(0.06)	(0.08)
School % Minority	-0.08*	-0.40***	-0.05	-0.26*	-0.08*	-0.40***	-0.09	-0.25*
	(0.03)	(0.12)	(0.06)	(0.12)	(0.03)	(0.12)	(0.06)	(0.12)
School % Free Lunch	-0.05	0.17***	0.57***	0.37***	-0.05	0.17***	0.55***	0.37***
	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)
2010-2011	0.04**				0.03*			
	(0.01)				(0.01)			
2011-2012	0.10***				0.10***			
	(0.02)				(0.02)			
2012-2013	-0.18***				-0.18***			
	(0.02)				(0.02)			
2009-2010	0.04**				0.04**			
	(0.01)				(0.01)			
Segregated*ESL Cert					-0.46***	-0.06	-0.49***	-0.29**
					(0.09)	(0.08)	(0.10)	(0.09)
Singleton*ESL Cert					0.08	0.04	-0.01	0.01
					(0.09)	(0.09)	(0.13)	(0.14)
Segregated*El Exp					-0.32***	-0.21*	-0.56***	-0.37***
					(0.08)	(0.08)	(0.08)	(0.09)
Singleton*El Exp					0.03	0.05**	0.04	0.04
					(0.02)	(0.02)	(0.02)	(0.02)

Constant	0.42	0.56*	-0.80	1.79***	0.44	0.57*	-0.65	1.80***
	(0.23)	(0.25)	(0.46)	(0.26)	(0.23)	(0.25)	(0.46)	(0.26)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.48	0.46	0.37	0.41	0.48	0.46	0.38	0.41
F	1041.37	1140.88	.	.	983.51	1062.52	.	.
Observations	74197.00	74197.00	74197.00	74197.00	74197.00	74197.00	74197.00	74197.00

Table B. 28 ***Full Results of Regression on Std. Math Achievement, CELs, MS***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.31***	-0.13***	-0.18***	-0.04	-0.12	0.02	-0.04	0.02
	(0.09)	(0.04)	(0.03)	(0.03)	(0.08)	(0.05)	(0.05)	(0.05)
Singleton	0.02*	0.04***	0.01	-0.01	0.04**	0.04***	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.09	-0.09	-0.01	-0.00	-0.13*	-0.09	-0.04	-0.00
	(0.05)	(0.05)	(0.03)	(0.03)	(0.05)	(0.05)	(0.03)	(0.03)
El Exp	0.01	0.02*	0.05***	0.04***	0.02	0.03*	0.06***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.60***	0.58***	-0.14***	-0.17***	0.60***	0.58***	-0.14***	-0.17***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	-0.10***	-0.09***	-0.18***	-0.27***	-0.10***	-0.09***	-0.18***	-0.27***
	(0.00)	(0.00)	(0.02)	(0.05)	(0.00)	(0.00)	(0.02)	(0.05)
exiter	0.14***	0.11***			0.14***	0.11***		
	(0.02)	(0.02)			(0.02)	(0.02)		
mover	-0.04***	-0.03***			-0.04***	-0.03***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Male	-0.00	-0.00			-0.00	-0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.07	0.11***			0.07	0.11***		
	(0.04)	(0.03)			(0.04)	(0.03)		
Asian	0.22***	0.22***			0.22***	0.22***		
	(0.02)	(0.02)			(0.02)	(0.02)		
Black	-0.06*	-0.03			-0.06*	-0.03		
	(0.02)	(0.02)			(0.02)	(0.02)		
Other Race	0.08***	0.09***			0.08***	0.09***		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.06***	-0.07***	-0.03	-0.02	-0.06***	-0.07***	-0.03	-0.02
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)
Gifted	0.29***	0.31***	0.06	0.06	0.29***	0.31***	0.06	0.06
	(0.02)	(0.02)	(0.06)	(0.06)	(0.02)	(0.02)	(0.06)	(0.06)
Moved in Year	-0.19***	-0.17***	-0.06***	-0.08***	-0.19***	-0.17***	-0.07***	-0.08***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Summer Move	-0.01	-0.00	-0.00	-0.20***	-0.01	-0.00	-0.00	-0.20***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.39***	-0.41***	-0.37***	-0.30***	-0.39***	-0.41***	-0.37***	-0.30***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Days Absent	-0.01***	-0.01***	-0.00***	-0.00***	-0.01***	-0.01***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.03	0.02	-0.41**	-0.43**	0.03	0.02	-0.41**	-0.42**
	(0.02)	(0.02)	(0.14)	(0.16)	(0.02)	(0.02)	(0.14)	(0.16)
Over Age	-0.07***	-0.07***	0.22***	0.18***	-0.07***	-0.07***	0.22***	0.18***
	(0.01)	(0.01)	(0.03)	(0.04)	(0.01)	(0.01)	(0.03)	(0.04)
Free Lunch	-0.05***	-0.02**			-0.05***	-0.02**		
	(0.01)	(0.01)			(0.01)	(0.01)		
pre_ma_mf	-0.89***	-0.84***	-0.23***	-0.14***	-0.89***	-0.84***	-0.23***	-0.14***
	(0.03)	(0.03)	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)
Evenness of CEL	0.02	0.01	0.11***	0.06***	0.01	0.01	0.11***	0.06***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Evenness of REL	0.05	0.05	0.30***	0.13***	0.05	0.05	0.30***	0.13***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
% Teacher Same Race	0.01*	0.01	0.02***	0.02**	0.01**	0.01	0.02***	0.02**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
School % El	-0.02	0.06***	0.02**	0.30***	-0.02	0.06***	0.02***	0.30***

	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
School % ESL Cred	0.00	0.03	-0.03*	-0.01	0.00	0.03	-0.03*	-0.01
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Bilingual/Heritage	0.02		-0.06*		0.02		-0.06*	
	(0.03)		(0.03)		(0.03)		(0.03)	
New Destination School	-0.01		0.04*		-0.01		0.04	
	(0.02)		(0.02)		(0.02)		(0.02)	
Established and Growing	0.01		-0.07***		0.01		-0.08***	
	(0.02)		(0.02)		(0.02)		(0.02)	
Established and Stable	0.00		-0.03		0.00		-0.03	
	(0.02)		(0.03)		(0.02)		(0.03)	
rural	-0.01	-0.01	-0.00	-0.00	-0.01	-0.01	0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.05		-0.21***		-0.04		-0.21***	
	(0.03)		(0.06)		(0.03)		(0.06)	
Class Size	-0.00	0.00	-0.00***	-0.00***	-0.00	0.00	-0.00**	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.02	-0.02	-0.04***	-0.03***	0.02	-0.02	-0.04***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.03*	-0.03*	-0.03***	-0.02**	-0.03*	-0.02*	-0.03***	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.11*	0.05	0.07*	0.06	0.09	0.05	0.05	0.06
	(0.05)	(0.06)	(0.03)	(0.04)	(0.05)	(0.07)	(0.04)	(0.04)
Advanced	0.14***	0.18***	0.02	-0.01	0.14***	0.18***	0.02	-0.01
	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)
Remedial	-0.05	-0.05*	-0.05*	-0.05*	-0.06*	-0.06*	-0.05*	-0.06*
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Teacher Avg. Test Score	0.03***	0.03***	0.02***	0.02***	0.03***	0.03***	0.02***	0.02***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
School Size	-0.00	0.01	-0.02***	0.01	-0.00	0.01	-0.02***	0.01
	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)
School Size Sq	0.00	0.00*	0.00***	0.00***	0.00	0.00*	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	-0.00	-0.00***	-0.01***	0.00	-0.00	-0.00***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02
	(0.00)	(0.02)	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)	(0.01)
% Full Credential	-0.14	0.29*	0.87***	0.91***	-0.14	0.30*	0.87***	0.91***
	(0.10)	(0.11)	(0.08)	(0.09)	(0.10)	(0.11)	(0.08)	(0.09)
% NBC	0.31**	-0.33	-0.16	-0.19	0.31**	-0.32	-0.17	-0.18
	(0.12)	(0.25)	(0.12)	(0.34)	(0.12)	(0.26)	(0.12)	(0.34)
% Adv Degree	-0.12	-0.54*	-0.64***	-0.26	-0.12	-0.54*	-0.63***	-0.27
	(0.08)	(0.22)	(0.09)	(0.30)	(0.07)	(0.22)	(0.09)	(0.30)
School % Minority	-0.06	0.05	0.15**	0.03	-0.07	0.07	0.14**	0.03
	(0.05)	(0.15)	(0.05)	(0.13)	(0.05)	(0.15)	(0.05)	(0.13)
School % Free Lunch	-0.01	0.05*	0.16***	0.14***	-0.01	0.05*	0.16***	0.14***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
2010-2011	0.16***				0.16***			
	(0.02)				(0.02)			
2011-2012	0.16***				0.16***			
	(0.02)				(0.02)			
2012-2013	0.17***				0.17***			
	(0.02)				(0.02)			
2009-2010	0.07***				0.07***			
	(0.02)				(0.02)			
Segregated*ESL Cert					0.04	-0.08	0.03	-0.05

					(0.14)	(0.12)	(0.07)	(0.08)
Singleton*ESL Cert					0.12	0.08	0.07	0.09
					(0.09)	(0.09)	(0.16)	(0.17)
Segregated*El Exp					-0.30***	-0.22**	-0.23***	-0.08
					(0.08)	(0.07)	(0.05)	(0.05)
Singleton*El Exp					-0.03	-0.01	-0.02	-0.03
					(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.53***	0.16	-0.23	0.44	0.53***	0.13	-0.23	0.45
	(0.11)	(0.24)	(0.13)	(0.30)	(0.11)	(0.24)	(0.13)	(0.31)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.52	0.49	0.34	0.38	0.52	0.49	0.34	0.38
F	.	.	377.22	.	.	.	351.19	.
Observations	83388.00	83388.00	83388.00	83388.00	83388.00	83388.00	83388.00	83388.00

Table B. 29 ***Full Results of Regression on Std. Math Achievement, RELs, Pooled***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	0.02	0.03	0.05	0.05	-0.00	0.01	0.06	0.10
	(0.03)	(0.03)	(0.03)	(0.04)	(0.06)	(0.06)	(0.06)	(0.07)
Singleton	0.03***	0.03***	0.01*	0.00	0.02**	0.03**	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.03	-0.02	-0.00	0.01	-0.02	-0.02	0.00	0.01
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
El Exp	0.01	0.00	0.02***	0.02***	0.01	0.00	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.65***	0.63***	-0.13***	-0.27***	0.65***	0.63***	-0.13***	-0.27***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Years CEL	-0.04***	-0.03***			-0.04***	-0.04***		
	(0.00)	(0.00)			(0.00)	(0.00)		
exiter	-0.13***	-0.13***			-0.13***	-0.13***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	-0.04***	-0.04***			-0.04***	-0.04***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	0.01*	0.01***			0.01*	0.01***		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.02	0.08**			0.02	0.08**		
	(0.04)	(0.03)			(0.04)	(0.03)		
Asian	0.12***	0.12***			0.12***	0.12***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Black	-0.01	0.00			-0.01	0.00		
	(0.01)	(0.01)			(0.01)	(0.01)		
Other Race	0.03**	0.03**			0.03**	0.03**		
	(0.01)	(0.01)			(0.01)	(0.01)		
Special Needs	-0.08***	-0.08***	-0.02	-0.05*	-0.08***	-0.08***	-0.02	-0.05*
	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)	(0.03)
Gifted	0.18***	0.21***	0.07***	0.10***	0.18***	0.21***	0.07***	0.10***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Moved in Year	-0.05***	-0.05***	-0.02*	-0.03*	-0.05***	-0.05***	-0.02*	-0.03*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Summer Move	-0.03*	-0.02	-0.02**	-0.17***	-0.03*	-0.02	-0.02**	-0.17***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.30***	-0.33***	-0.18***	-0.23***	-0.30***	-0.33***	-0.18***	-0.23***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Days Absent	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.09***	0.09***	0.06	-0.20***	0.09***	0.09***	0.06	-0.20***
	(0.01)	(0.01)	(0.11)	(0.01)	(0.01)	(0.01)	(0.11)	(0.01)
Over Age	-0.07***	-0.07***	0.16***	0.36***	-0.07***	-0.07***	0.16***	0.36***
	(0.00)	(0.00)	(0.04)	(0.05)	(0.00)	(0.00)	(0.04)	(0.05)
Free Lunch	-0.03***	-0.03***			-0.03***	-0.03***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Evenness of CEL	-0.01	-0.01	0.01	-0.00	-0.01	-0.01	0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Evenness of REL	0.01	0.07**	0.27***	0.32***	0.01	0.07**	0.27***	0.32***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
% Teacher Same Race	0.01	-0.00	0.00	0.01*	0.01	-0.00	0.00	0.01*

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
School % El	0.01**	0.08***	0.05***	0.15***	0.01**	0.08***	0.05***	0.15***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
School % ESL Cred	-0.01	0.00	-0.01*	-0.03***	-0.01	0.00	-0.01*	-0.03***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Bilingual/Heritage	-0.03		-0.07***		-0.03		-0.07***	
	(0.01)		(0.01)		(0.01)		(0.01)	
New Destination School	-0.02		-0.04***		-0.02		-0.04***	
	(0.01)		(0.01)		(0.01)		(0.01)	
Established and Growing	-0.03**		-0.08***		-0.03**		-0.08***	
	(0.01)		(0.01)		(0.01)		(0.01)	
Established and Stable	-0.03*		-0.03**		-0.03*		-0.03**	
	(0.01)		(0.01)		(0.01)		(0.01)	
rural	-0.03***	-0.01	-0.00	-0.02*	-0.03***	-0.01	-0.00	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.03*		-0.09*		-0.03*		-0.09*	
	(0.01)		(0.04)		(0.01)		(0.04)	
Class Size	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.08***	0.07***	0.06***	0.01**	0.08***	0.07***	0.06***	0.01**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Years Experience	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.02*	-0.02*	-0.02***	-0.03***	-0.02*	-0.02*	-0.02***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.10**	0.05	0.05	-0.01	0.10**	0.04	0.05	-0.02
	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)
Advanced	0.04**	0.05***	-0.00	-0.00	0.04**	0.05***	-0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Remedial	-0.07*	-0.04	-0.06*	-0.03	-0.07*	-0.04	-0.06*	-0.03
	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Teacher Avg. Test Score	0.02***	0.02**	0.02***	0.01***	0.02***	0.02**	0.02***	0.01***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
School Size	-0.01*	-0.02**	-0.03***	-0.07***	-0.01*	-0.02**	-0.03***	-0.07***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
School Size Sq	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	0.00	-0.01***	-0.01***	0.00	0.00	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01**	0.00	-0.00	-0.03**	0.01**	0.00	-0.00	-0.03**
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
% Full Credential	-0.12	-0.18	0.48***	0.35***	-0.12	-0.18	0.48***	0.35***
	(0.08)	(0.12)	(0.06)	(0.10)	(0.08)	(0.12)	(0.06)	(0.10)
% NBC	0.05	0.02	0.24***	2.31***	0.05	0.02	0.24***	2.31***
	(0.06)	(0.09)	(0.04)	(0.11)	(0.06)	(0.09)	(0.04)	(0.11)
% Adv Degree	-0.04	-0.19**	-0.12***	-0.01	-0.04	-0.19**	-0.12***	-0.01
	(0.04)	(0.07)	(0.03)	(0.08)	(0.04)	(0.07)	(0.03)	(0.08)
School % Minority	-0.07**	-0.13	0.02	0.01	-0.07**	-0.13	0.02	0.01
	(0.02)	(0.10)	(0.03)	(0.09)	(0.02)	(0.10)	(0.03)	(0.09)
School % Free Lunch	0.05**	0.01	0.23***	0.17***	0.05**	0.01	0.23***	0.17***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Elementary	0.20***	0.37***	0.43***	0.59***	0.20***	0.37***	0.43***	0.59***
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)	(0.02)

2010-2011	0.02*				0.02*			
	(0.01)				(0.01)			
2011-2012	0.04***				0.04***			
	(0.01)				(0.01)			
2012-2013	-0.01				-0.01			
	(0.02)				(0.02)			
2009-2010	0.03*				0.03*			
	(0.01)				(0.01)			
Segregated*ESL Cert					0.02	0.05	0.06	0.06
					(0.13)	(0.15)	(0.13)	(0.13)
Singleton*ESL Cert					-0.04	-0.03	-0.04	0.00
					(0.06)	(0.07)	(0.07)	(0.07)
Segregated*El Exp					0.03	0.01	-0.02	-0.08
					(0.07)	(0.07)	(0.07)	(0.08)
Singleton*El Exp					0.00	-0.00	-0.00	-0.00
					(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.40***	0.59***	0.08	0.84***	0.40***	0.59***	0.08	0.84***
	(0.09)	(0.16)	(0.07)	(0.14)	(0.09)	(0.16)	(0.07)	(0.14)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.63	0.59	0.29	0.31	0.63	0.59	0.29	0.31
F	.	.	.	.	.	.	.	.
Observations	119589.00	119589.00	119589.00	119589.00	119589.00	119589.00	119589.00	119589.00

Table B. 30 ***Full Results of Regression on Std. Math Achievement, RELs, ES***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	-0.09	-0.05	-0.06	-0.04	-0.14*	-0.08	-0.15	-0.17
	(0.05)	(0.05)	(0.08)	(0.09)	(0.07)	(0.07)	(0.11)	(0.13)
Singleton	0.03***	0.04***	0.01	0.00	0.04**	0.04***	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
ESL Cert	-0.03	-0.03	-0.01	-0.01	-0.04	-0.04	-0.02	-0.02
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
El Exp	-0.01	-0.01	0.00	0.01	-0.01	-0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.62***	0.61***	-0.30***	-0.31***	0.62***	0.61***	-0.30***	-0.31***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	-0.10***	-0.09***			-0.10***	-0.09***		
	(0.00)	(0.00)			(0.00)	(0.00)		
exiter	-0.03*	-0.07***			-0.03*	-0.07***		
	(0.01)	(0.01)			(0.01)	(0.01)		
mover	0.03***	0.02***			0.03***	0.02***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	0.02***	0.03***			0.02***	0.03***		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.00	0.05			0.00	0.05		
	(0.05)	(0.04)			(0.05)	(0.04)		
Asian	0.10***	0.10***			0.10***	0.10***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Black	-0.03	-0.02			-0.03	-0.02		
	(0.02)	(0.02)			(0.02)	(0.02)		
Other Race	-0.01	-0.01			-0.01	-0.01		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.07***	-0.07***	-0.04	-0.02	-0.07***	-0.07***	-0.04	-0.02
	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.04)	(0.04)
Gifted	0.20***	0.21***	0.14***	0.13***	0.20***	0.21***	0.14***	0.13***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Moved in Year	-0.05***	-0.04***	-0.04*	-0.03	-0.05***	-0.04***	-0.04*	-0.03
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Summer Move	-0.01	-0.01	-0.04**	-0.17***	-0.01	-0.01	-0.04**	-0.17***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Forced Move	-0.04	-0.21***	-0.13***	-0.15***	-0.04	-0.21***	-0.13***	-0.15***
	(0.03)	(0.05)	(0.02)	(0.03)	(0.03)	(0.05)	(0.02)	(0.03)
Days Absent	-0.01***	-0.01***	-0.00***	-0.01***	-0.01***	-0.01***	-0.00***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.08**	0.07**	-0.07***	-0.03	0.08**	0.07**	-0.07***	-0.03
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Over Age	-0.08***	-0.08***	0.53***	0.47***	-0.08***	-0.08***	0.53***	0.48***
	(0.01)	(0.01)	(0.07)	(0.08)	(0.01)	(0.01)	(0.07)	(0.08)
Free Lunch	-0.02***	-0.03***			-0.02***	-0.03***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	-0.02	0.00	0.04*	0.03	-0.02	0.00	0.04*	0.03
	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
Evenness of REL	0.01	0.30***	0.81***	0.67***	0.01	0.30***	0.81***	0.67***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
% Teacher Same Race	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
School % El	0.01	0.04***	0.11***	0.22***	0.01	0.04***	0.11***	0.22***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
School % ESL Cred	-0.01	0.02	-0.00	0.01	-0.01	0.02	-0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Bilingual/Heritage	0.00		-0.13*		0.00		-0.13*	
	(0.02)		(0.06)		(0.02)		(0.06)	
New Destination School	0.02		-0.08**		0.02		-0.08**	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Growing	0.01		-0.11***		0.01		-0.11***	
	(0.01)		(0.03)		(0.01)		(0.03)	
Established and Stable	-0.01		-0.13***		-0.01		-0.13***	
	(0.01)		(0.04)		(0.01)		(0.04)	
rural	-0.01	-0.00	-0.02*	-0.03*	-0.01	-0.00	-0.02*	-0.03*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.00		-0.13		-0.00		-0.13	
	(0.02)		(0.08)		(0.02)		(0.08)	
Class Size	-0.00	0.00	0.00**	0.00	-0.00	0.00	0.00**	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.01	-0.03**	-0.01	0.00	0.01	-0.03**	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.02*	-0.03**	-0.02**	-0.03**	-0.02*	-0.03**	-0.02**	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.08	0.05	0.02	0.01	0.08	0.05	0.01	0.01
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Teacher Avg. Test Score	0.01*	0.01	0.01*	0.01*	0.01*	0.01	0.01*	0.01*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
School Size	0.00	-0.12***	-0.17***	-0.37***	0.00	-0.12***	-0.17***	-0.37***
	(0.01)	(0.03)	(0.02)	(0.04)	(0.01)	(0.03)	(0.02)	(0.04)
School Size Sq	-0.00	0.01**	0.01***	0.02***	-0.00	0.01**	0.01***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	-0.00***	-0.02***	-0.02***	0.00	-0.00***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.01***	0.00	-0.01	-0.01	0.01***	0.00	-0.01	-0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
% Full Credential	-0.16	-0.10	1.14***	0.92***	-0.15	-0.09	1.14***	0.92***
	(0.16)	(0.20)	(0.18)	(0.21)	(0.16)	(0.20)	(0.18)	(0.21)
% NBC	-0.04	0.47***	1.97***	2.76***	-0.04	0.47***	1.97***	2.76***
	(0.05)	(0.09)	(0.08)	(0.10)	(0.05)	(0.09)	(0.08)	(0.10)
% Adv Degree	-0.03	-0.27***	-0.51***	-0.53***	-0.03	-0.27***	-0.51***	-0.53***
	(0.04)	(0.07)	(0.07)	(0.08)	(0.04)	(0.07)	(0.07)	(0.08)
School % Minority	-0.03	-0.26*	-0.10	-0.14	-0.03	-0.25*	-0.10	-0.14
	(0.03)	(0.12)	(0.07)	(0.12)	(0.03)	(0.12)	(0.07)	(0.12)
School % Free Lunch	-0.01	0.21***	0.47***	0.35***	-0.01	0.21***	0.47***	0.35***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
2010-2011	0.19***				0.19***			
	(0.01)				(0.01)			
2011-2012	0.34***				0.34***			
	(0.02)				(0.02)			
2012-2013	0.12***				0.12***			
	(0.02)				(0.02)			
2009-2010	0.08***				0.08***			
	(0.01)				(0.01)			
Segregated*ESL Cert					-0.05	0.04	0.40	0.38
					(0.17)	(0.17)	(0.22)	(0.22)
Singleton*ESL Cert					0.05	0.10	0.08	0.08
					(0.07)	(0.08)	(0.10)	(0.10)
Segregated*El Exp					0.10	0.04	0.09	0.15
					(0.10)	(0.10)	(0.15)	(0.17)
Singleton*El Exp					-0.02	-0.01	-0.01	-0.01
					(0.01)	(0.02)	(0.02)	(0.02)

Constant	0.49**	1.30***	0.99***	2.28***	0.49**	1.30***	0.99***	2.27***
	(0.17)	(0.26)	(0.20)	(0.28)	(0.17)	(0.26)	(0.20)	(0.28)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.61	0.57	0.34	0.37	0.61	0.57	0.34	0.37
F	.	.	.	.	.	.	.	.
Observations	54488.00	54488.00	54488.00	54488.00	54488.00	54488.00	54488.00	54488.00

Table B. 31 ***Full Results of Regression on Std. Math Achievement, RELs, MS***

	Model 1	Model 1A	Model 1B	Model 1C	Model 2	Model 3	Model 4	Model 5
Segregated	0.04	0.04	0.06	0.05	0.03	0.05	0.15*	0.14
	(0.04)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)	(0.07)	(0.07)
Singleton	0.02*	0.02*	0.00	0.00	0.02	0.02	-0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Cert	-0.01	-0.01	0.06	0.11***	0.00	0.00	0.06	0.12***
	(0.06)	(0.05)	(0.03)	(0.03)	(0.06)	(0.06)	(0.03)	(0.03)
El Exp	0.02	0.02	0.04***	0.02**	0.02	0.02	0.03***	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Prior Achievement	0.66***	0.65***	-0.26***	-0.27***	0.66***	0.65***	-0.26***	-0.27***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Years CEL	0.00	0.01***			0.00	0.01***		
	(0.00)	(0.00)			(0.00)	(0.00)		
exiter	0.13***	0.10***			0.13***	0.10***		
	(0.02)	(0.02)			(0.02)	(0.02)		
mover	-0.06***	-0.07***			-0.06***	-0.07***		
	(0.00)	(0.00)			(0.00)	(0.00)		
Male	-0.01	-0.00			-0.01	-0.00		
	(0.00)	(0.00)			(0.00)	(0.00)		
White	0.03	0.09*			0.03	0.09*		
	(0.04)	(0.04)			(0.04)	(0.04)		
Asian	0.14***	0.13***			0.14***	0.13***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Black	0.00	0.02			0.00	0.02		
	(0.02)	(0.02)			(0.02)	(0.02)		
Other Race	0.06***	0.07***			0.06***	0.07***		
	(0.02)	(0.02)			(0.02)	(0.02)		
Special Needs	-0.08***	-0.08***	-0.07	-0.07*	-0.08***	-0.08***	-0.07*	-0.07*
	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.04)	(0.04)
Gifted	0.17***	0.20***	0.02	0.02	0.17***	0.20***	0.02	0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Moved in Year	-0.05**	-0.05***	0.01	-0.00	-0.05**	-0.05***	0.01	-0.00
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Summer Move	-0.07**	-0.05*	-0.05***	-0.15***	-0.07**	-0.05*	-0.05***	-0.15***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Forced Move	-0.34***	-0.36***	-0.29***	-0.30***	-0.34***	-0.36***	-0.29***	-0.30***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Days Absent	-0.01***	-0.01***	-0.00***	-0.01***	-0.01***	-0.01***	-0.00***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Under Age	0.09***	0.08***	0.45***		0.09***	0.08***	0.45***	
	(0.02)	(0.02)	(0.07)		(0.02)	(0.02)	(0.07)	
Over Age	-0.07***	-0.07***	0.08	0.26***	-0.07***	-0.07***	0.08	0.26***
	(0.01)	(0.01)	(0.06)	(0.06)	(0.01)	(0.01)	(0.06)	(0.06)
Free Lunch	-0.04***	-0.04***			-0.04***	-0.04***		
	(0.01)	(0.01)			(0.01)	(0.01)		
Evenness of CEL	-0.00	-0.00	0.06***	0.04***	-0.00	-0.00	0.06***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Evenness of REL	-0.01	-0.05	0.04	-0.03	-0.01	-0.05	0.04	-0.03
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
% Teacher Same Race	0.01	-0.00	0.01**	0.01	0.01	-0.00	0.01**	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
School % El	0.01	0.01	0.01	0.09***	0.01	0.01	0.01	0.09***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
School % ESL Cred	-0.02	-0.04**	-0.08***	-0.05***	-0.02	-0.04**	-0.08***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

Bilingual/Heritage	-0.00		-0.01		-0.00		-0.01	
	(0.02)		(0.04)		(0.02)		(0.04)	
New Destination School	-0.04*		-0.04		-0.04*		-0.04	
	(0.02)		(0.02)		(0.02)		(0.02)	
Established and Growing	-0.04*		-0.11***		-0.04*		-0.11***	
	(0.02)		(0.02)		(0.02)		(0.02)	
Established and Stable	-0.02		-0.11***		-0.02		-0.11***	
	(0.02)		(0.03)		(0.02)		(0.03)	
rural	-0.03*	-0.02	-0.00	-0.01	-0.03*	-0.02	-0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
topfive	-0.05*		-0.05		-0.05*		-0.05	
	(0.02)		(0.07)		(0.02)		(0.07)	
Class Size	-0.00	-0.00*	-0.00*	-0.00*	-0.00	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Peer Achievment	0.11***	0.10***	0.02***	0.02**	0.11***	0.10***	0.02***	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years Experience	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
newteach	-0.01	-0.01	-0.02*	-0.01	-0.01	-0.01	-0.02*	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ESL Course	0.05	0.02	-0.00	0.01	0.05	0.02	-0.01	0.01
	(0.04)	(0.06)	(0.04)	(0.05)	(0.04)	(0.06)	(0.04)	(0.05)
Advanced	0.02*	0.03*	0.02**	0.01	0.02*	0.03*	0.02**	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Remedial	-0.04	-0.00	0.01	0.01	-0.04	-0.00	0.01	0.01
	(0.04)	(0.05)	(0.03)	(0.03)	(0.04)	(0.05)	(0.03)	(0.03)
Teacher Avg. Test Score	0.03***	0.02**	0.02***	0.02***	0.03***	0.02**	0.02***	0.02***
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
School Size	0.00	0.01	-0.03***	0.02	0.00	0.01	-0.03***	0.02
	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.02)
School Size Sq	0.00	0.00	0.00***	0.00***	0.00	0.00	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PPE	0.00	0.00	-0.01***	-0.01***	0.00	0.00	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Title 3 Funds	0.00	0.01	0.01	-0.02	0.00	0.01	0.01	-0.02
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
% Full Credential	-0.30**	-0.02	0.47***	0.46***	-0.29**	-0.01	0.47***	0.46***
	(0.10)	(0.14)	(0.09)	(0.11)	(0.10)	(0.14)	(0.09)	(0.11)
% NBC	0.08	-0.33	-0.59***	-0.47	0.08	-0.33	-0.59***	-0.47
	(0.09)	(0.26)	(0.13)	(0.32)	(0.09)	(0.26)	(0.13)	(0.32)
% Adv Degree	-0.07	-0.21	-0.30**	0.07	-0.07	-0.22	-0.30**	0.07
	(0.07)	(0.20)	(0.10)	(0.25)	(0.07)	(0.20)	(0.10)	(0.25)
School % Minority	-0.11**	-0.07	0.04	-0.16	-0.11**	-0.07	0.04	-0.17
	(0.03)	(0.15)	(0.06)	(0.12)	(0.03)	(0.15)	(0.06)	(0.12)
School % Free Lunch	-0.01	-0.02	0.16***	0.11***	-0.01	-0.02	0.16***	0.11***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2010-2011	0.01				0.01			
	(0.01)				(0.01)			
2011-2012	0.02				0.02			
	(0.02)				(0.02)			
2012-2013	0.05*				0.05*			
	(0.02)				(0.02)			
2009-2010	0.03				0.03			
	(0.02)				(0.02)			
Segregated*ESL Cert					0.10	0.10	0.04	-0.03
					(0.21)	(0.25)	(0.15)	(0.13)
Singleton*ESL Cert					-0.25*	-0.23*	-0.04	-0.09
					(0.10)	(0.10)	(0.11)	(0.11)

Segregated*El Exp					-0.00	-0.02	-0.15	-0.15
					(0.09)	(0.09)	(0.08)	(0.08)
Singleton*El Exp					-0.00	-0.01	0.01	0.01
					(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.61***	0.30	0.43***	0.42	0.61***	0.30	0.43***	0.42
	(0.12)	(0.24)	(0.12)	(0.22)	(0.12)	(0.24)	(0.12)	(0.22)
Controls	X	X	X	X	X	X	X	X
Interactions					X	X	X	X
School FE		X		X		X		X
Student FE			X	X			X	X
R^2	0.66	0.63	0.30	0.33	0.66	0.63	0.30	0.33
F	.	.	.	.	.	.	.	.
Observations	65101.00	65101.00	65101.00	65101.00	65101.00	65101.00	65101.00	65101.00

APPENDIX C: Sensitivity Analyses

In this section I explore the three limitations to my study described in Chapter 3. First, I describe the mobility of the El population in more detail and how mobility impacts estimates. Second, I test whether changing the two-student threshold used to indicate that a teacher has "El Experience" alters estimates. Last I describe the samples used for estimating the effect of treatment when implementing school or student fixed effects and show how using restricted samples impacts estimates. I conclude by describing how these sensitivity analyses inform the overall findings.

El mobility: Exiters, movers, and stayers. The mobility of the El population can have significant impacts on results; especially results estimated using student and/or school fixed effects. I use t-tests to investigate whether there are statistically significant differences in average achievement, assignment to credentialed teachers, assignment to El experienced teachers, or the level of classroom segregation between students who are more or less mobile. Table C.1 summarizes the groups that I compare. Because 40% of students change El status from CEL to REL during the course of the study, analyses are performed on a pooled CEL and REL sample.

Table C. 1 ***Description of Mobility Groups***

Group	Definition
Exiter	Els who are observed in only 1 year
Mover	Els who have multiple years of data but whose enrollment in NC schools is not continuous (i.e., they are in the dataset for 3^{rd} grade, 5^{th} grade, and 8^{th} grade)
Stayer	Els who have at least 2 years of continuous data (i.e., observed in grades 3, 4, and 5.)

The majority of the total sample, 62%, are movers. A little over a quarter of the sample (27%) are stayers and about 11% of the sample are exiters. Table C.2 describes differences between stayers, movers, and exiters. Each student can have a maximum of 5 observations per subject: 1 observation per year. Movers on average have the greatest number of observations, and by definition exiters have the least. Compared to stayers, movers change elementary schools less frequently but change middle schools more frequently.

Table C. 2 ***Differences between Stayers, Movers, and Exiters***

	Stayer	Mover	Mover v. Stayer	Exiter	Exiter v. Stayer
Std.Score	-0.31	-0.31	0.00	-0.52	0.21***
	(0.92)	(0.92)	(0.70)	(0.93)	(32.81)
Segregated	0.02	0.02	0.00***	0.03	-0.01***
	(0.15)	(0.15)	(3.96)	(0.17)	(-5.18)
Mainstream	0.86	0.86	0.00	0.84	0.02***
	(0.34)	(0.34)	(0.56)	(0.37)	(9.25)
Singleton	0.11	0.12	-0.00*	0.13	-0.02***
	(0.32)	(0.32)	(-2.50)	(0.34)	(-7.47)
Exposure	0.76	0.77	-0.01***	0.77	-0.01***
	(0.22)	(0.21)	(-12.24)	(0.22)	(-8.34)
ESL Credential	0.04	0.04	0.00***	0.04	-0.00
	(0.19)	(0.18)	(4.28)	(0.20)	(-1.86)
El Experience	0.67	0.67	-0.00	0.62	0.06***
	(0.47)	(0.47)	(-0.05)	(0.49)	(16.84)
Total Observations	2.92	3.65	-0.73***	1.00	1.92***
	(0.89)	(1.01)	(-175.13)	(0.00)	(572.22)
Moved in ES	0.09	0.08	0.00	0.00	0.09***
	(0.28)	(0.28)	(1.25)	(0.00)	(81.39)
Moved in MS	0.05	0.10	-0.04***	0.00	0.05***
	(0.23)	(0.30)	(-37.95)	(0.00)	(64.21)
# Schools	1.69	1.88	-0.18***	1.00	0.69***
	(0.61)	(0.63)	(-66.89)	(0.00)	(302.02)
# of ES	1.11	1.10	0.00	1.00	0.11***
	(0.31)	(0.31)	(1.63)	(0.00)	(82.23)
# of MS	1.08	1.12	-0.04***	1.00	0.08***
	(0.28)	(0.34)	(-27.32)	(0.00)	(63.82)
Observations	70,977	166,778		29,293	

In terms of achievement and assignment to treatment movers and stayers are remarkably similar. There are no significant differences in their average ELA achievement, their assignment to mainstream classes, or their assignment to classes with El experienced teachers. While t-tests detect significant differences in the assignment of movers and stayers to segregated or singleton classes, the level of overall exposure, and assignment to ESL credentialed teachers, the differences in means are practically insignificant.

There are considerable differences between stayers and exiters in terms of achievement. Exiters score about .2 standard deviations lower in ELA than stayers. However, while there are significant differences in assignment to treatment between exiters and stayers, these differences are generally smaller than 2%. The only exception is that 5% fewer exiters are assigned to EL experienced teachers compared to stayers.

Given that stayers substantially outperform exiters on their ELA assessments even the small differences in assignment to treatment between groups could be important. For example, exiters are more likely than stayers to be assigned to classes with El experienced teachers and they perform worse on average. In OLS models that do not control for exiters or in models that use student fixed effects (and so do not include exiters), estimates of the effect of being assigned to a classroom with an El experienced teacher could be positively biased.

Table C.3 shows the results of Model 2 (OLS) estimates of the impact of each treatment variable on ELA achievement using the full sample, a sample with no exiters (Movers and Stayers), and a sample with only exiters. Including exiters in the sample has a substantial impact on the magnitude of the effect of being in a segregated classroom. Additionally, including exiters in the sample has enough of an influence on the estimate of the impact of having an ESL credentialed teacher to make the estimate significant. In sum, including an indicator of whether a student is an exiter or a mover is an important protection against negative bias.

Table C. 3 ***Estimates of Effects of Treatment on ELA Achievement, All Els,***

	Full Sample	**Movers & Stayers**	**Exiters**
Segregated	-0.17***	-0.12***	-0.34***
	(0.04)	(0.03)	(0.06)
Singleton	0.03***	0.03***	0.04**
	(0.00)	(0.00)	(0.01)
ESL Cert	-0.04*	-0.03	-0.06
	(0.02)	(0.02)	(0.04)
El Exp	0.00	0.00	0.02
	(0.01)	(0.01)	(0.01)
Observations	267002	237736	29266

Importantly, estimates between the full sample and the Movers and Stayers sample are quite similar. Estimates of treatment effects using student fixed effects models will not include exiters, and so will be based on a sample similar to the movers and stayers sample. Given the similarity in estimates between these two samples, the potential bias of not including exiters is minimal. Indeed, Table C.4 shows estimates obtained using student fixed effects are similar when using the full sample and the movers and stayers samples.

Table C. 4 ***Student Fixed Effects Estimates of Treatment, CEL, ELA, Alternative Samples***

	Full Sample	**Movers and Stayers**
Segregated	-0.13***	-0.11***
	(0.01)	(0.01)
Singleton	0.01**	0.01*
	(0.00)	(0.00)
ESL Cert	-0.03***	-0.02*
	(0.01)	(0.01)
El Exp	-0.03***	-0.03***
	(0.00)	(0.00)
Observations	267002	237736

The preceding analysis shows that exiters have a discernable impact on effects in both OLS and fixed effects estimates. As such, all models were estimated including both an exiter and mover control variable. In almost all cases, including these control variables minimally changed the magnitude of effects and had no impact on significance.

Teacher experience. Next I test whether the threshold used to indicate whether a teacher has El experienced substantively changes results. The original measure identifies teachers as having El experienced if they taught at least 2 Els in the previous year. In this section I test three other thresholds: whether a teacher taught at least 1 El, 3 Els, or 6 Els in the previous year.

A first year teacher by definition cannot have experience teaching any Els in the previous year. To test whether including first year teachers in models impacts the relationship between El experience at a particular threshold and achievement, models were also estimated using samples that excluded these teachers. Results are consistent when estimated using samples with or without new teachers.

In the results presented above, the general conclusion was that when comparing within student, being taught by an El experienced teacher had a positive effect on ELA and math achievement. The effect on ELA achievement was evident in both middle and elementary schools for RELS and just in middle school for CELS. Changing the threshold only marginally changes the conclusions from above. When using a 1 EL threshold, the estimated effect on EL achievement derived from the pooled sample and the middle school samples become insignificant. Changing the threshold to 3 or 6 Els reduces the magnitude of the effect but does not change the sign or the significance. Similarly, neither the sign or significance of any result changes when examining CEL math achievement; however, the magnitude of the effect decreases as the number of students a teacher taught in the previous year increases.

Table C. 5 ***Estimates of the effect of EL experience on ELA, OLS, Pooled Samples***

Threshold	**Sch/St FE**	**Student FE**	**School FE**	**OLS**
CEL				
1 El	0.02	0.02*	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
2 Els	**0.03*** **	**0.02*** **	**-0.01**	**-0.00**
	(0.01)	**(0.01)**	**(0.01)**	**(0.01)**
3 Els	0.02***	0.01**	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
6 Els	0.02***	0.01**	-0.01	-0.01
	(0.01)	(0.00)	(0.01)	(0.01)
REL				
1 El	0.03**	0.04***	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
2 Els	**0.02*** **	**0.03*** **	**0.01**	**0.01***
	(0.01)	**(0.01)**	**(0.01)**	**(0.01)**
3 Els	0.01**	0.02***	0.00	0.00
	(0.01)	(0.00)	(0.01)	(0.01)
6 Els	0.01	0.01	-0.00	-0.00
	(0.01)	(0.00)	(0.01)	(0.01)

The estimated effect of having an EL experienced teacher on REL achievement is more sensitive to variations in the threshold. For elementary school reading achievement, reducing the threshold to one student or increasing the threshold to six students results in an insignificant estimated effect. A threshold of three students changes the significance of the estimates using the school fixed effect model only. For middle school reading achievement, increasing the threshold leads to insignificant estimates, and reducing the threshold only alters the effect estimated using the school and student fixed effect model.

math.

Middle school math results are also impacted by changing the Experience threshold. Decreasing the threshold to 1 approximately doubles the magnitude of the impact and detects a significant impact on achievement across all models. Increasing the threshold has little impact on the conclusions for the impact of achievement in middle school math.

In sum, the same overall story emerges regardless of the experience threshold: being taught by an El experienced teacher has a small positive effect on El achievement. However, an important pattern emerges when comparing results across all models. As the threshold increases, the positive advantage of having an El experienced teacher decreases. That is, the effect of being taught by a teacher who taught 6 Els the previous year is always smaller than the effect of being taught by a teacher who taught 1 EL in the previous year.

This pattern makes sense if we consider that estimates are based on comparisons between teachers with El experience at a particular threshold and teachers who taught fewer Els than the threshold. For instance, when estimating effects using the 1 student threshold, the comparison is between teachers who taught at least 1 el and those who taught 0. When estimating the effect using the 6-student threshold, the comparison is between students in classrooms with teachers who taught at least 6 Els to those in classrooms with teachers who taught 5 or fewer. The results suggest that the greatest gain from experience teaching Els comes from teaching any Els compared to none and that there are diminishing returns to expereince above 1 student.

Fixed Effects Samples. As discussed in Chapter 3, one issue that arises when using fixed effects models is that effects are estimated using only within unit variation. This issue can be problematic if there is little variation within a particular unit. In this study, there are three types of fixed effects used: within school, within student, and within student and school. In this section I describe the variation within these units and re-estimate models using samples constrained to “switchers”.

Model 3 uses a school fixed effect, meaning that all comparisons are within school. The within-school estimator requires variation in each treatment variable within school. For example, there would need to be at least one class led by an ESL credentialed teacher at a particular school over the five years of the study. Table C.6 shows the proportion of schools that meet this criterion for each of the five treatment variables.

Table C. 6 ***Percent of Sample Used To Estimate Model 3, ELA and Math***

	ESL Credential	EL Experience	Segregated	Mainstream	Singleton
ELA					
Full Sample	48.03	99.61	58.79	99.82	97.16
CEL Pooled	48.88	99.61	59.64	99.82	96.94
CEL ES	49.70	99.34	52.58	99.70	94.52
CEL MS	48.14	99.85	66.04	99.93	99.13
REL Pooled	46.98	99.61	57.75	99.81	97.45
REL ES	47.06	99.27	50.50	99.65	95.65
REL MS	46.92	99.89	63.84	99.95	98.95
MATH					
Full Sample	24.22	99.67	42.47	99.88	93.76
CEL Pooled	25.55	99.68	42.94	99.88	93.20
CEL ES	32.28	99.48	22.84	99.82	87.31
CEL MS	19.56	99.85	60.82	99.93	98.44
REL Pooled	22.47	99.66	41.86	99.87	94.51
REL ES	28.64	99.45	20.18	99.79	89.41
REL MS	17.30	99.83	60.01	99.95	98.78

Over 90% of the sample is used in estimating the effect of EL experience, being in a mainstream class, or being in a singleton class on achievement. As discussed above, there are relatively few teachers with and ESL credential or Els in a segregated setting. The small proportions result in a reduction in the sample used for estimation of anywhere from 35% to almost 85%. The reduction is most extreme when estimating results using the middle school samples.

Estimating models using student fixed effects requires that the treatment variable vary for a particular student. Table C.7 below shows the percent of students for whom this is true for each treatment variable. It is immediately obvious that there is a drastic reduction in the proportion of the sample used to estimate the effects of any of the variables. The reduction is at least twice as large as for the school fixed effects model. The samples used to estimate the effect of segregation are less than 10% of then the corresponding full sample.

Table C. 7 ***Percent of Sample Used To Estimate Model 4, ELA and Math***

	ESL Credential	EL Experience	Segregated	Mainstream	Singleton
ELA					
Full Sample	8.54	55.48	4.81	26.95	22.83
CEL Pooled	10.54	52.62	7.54	25.82	19.29
CEL ES	10.54	52.59	7.01	24.22	18.12
CEL MS	10.54	52.66	8.02	27.27	20.34
REL Pooled	6.05	59.03	1.42	28.36	27.24
REL ES	5.19	51.03	1.41	23.08	21.96
REL MS	6.78	65.76	1.42	32.80	31.67
MATH					
Full Sample	4.87	53.73	1.80	21.87	20.40
CEL Pooled	5.26	50.65	2.59	19.40	17.22
CEL ES	6.09	49.72	1.97	17.07	15.43
CEL MS	4.52	51.47	3.15	21.47	18.82
REL Pooled	4.36	57.81	0.75	25.12	24.58
REL ES	4.11	49.70	0.58	19.86	19.43
REL MS	4.57	64.59	0.89	29.53	28.89

Finally, model five uses both student and school fixed effects. Combining these fixed effects makes the most difference on the sample used for estimating the effect of a student being taught by en El experienced teacher or being in a Mainstream or Singleton classroom. Across all of the variables, less than 25% percent of the full sample is used to estimate any effect.

Table C. 8 ***Percent of Sample Used To Estimate Model 5, ELA and Math***

	ESL Credential	EL Experience	Segregated	Mainstream	Singleton
ELA					
Full Sample	4.66	16.73	1.43	7.92	6.67
CEL Pooled	5.87	14.25	2.13	6.72	4.84
CEL ES	5.18	10.94	1.39	4.68	3.47
CEL MS	6.50	17.25	2.80	8.57	6.08
REL Pooled	3.16	19.81	0.57	9.40	8.95
REL ES	3.23	16.75	0.68	7.21	6.68
REL MS	3.10	22.38	0.47	11.24	10.86
MATH					
Full Sample	2.33	16.22	0.47	6.49	6.11
CEL Pooled	2.59	13.79	0.63	5.01	4.46
CEL ES	3.54	10.25	0.23	2.69	2.48
CEL MS	1.74	16.94	0.98	7.06	6.22
REL Pooled	1.99	19.44	0.25	8.45	8.28
REL ES	2.82	16.56	0.11	5.23	5.13
REL MS	1.29	21.84	0.36	11.15	10.92

The reduction in sample size is not necessarily a problem given the size of the original sample. For instance, 5% of the REL middle school sample is 3,255 students, which is still quite large. What is more problematic is that it is likely that variation in a particular variable within a school or a student is not random but associated with some characteristic of a school or student. For instance, there could be within student variation in the value of the segregated class variable if a student reclassifies and so shifts to a mainstream setting. In contrast, there would not be within student variation in the value of the segregated class variable if a student were always in a segregated class, perhaps because that student has a particular learning disability that requires specialized attention. The included variables would control for the sort of characteristics just described, i.e. disability or reclassification. However, it is possible that there are unobserved variables that are also related to why a student or school would have variation in a particular variable that could bias results.

Table C.9 shows estimates of the effect of being in a segregated classroom on CEL ELA achievement derived from OLS and Fixed Effects models. I estimate an OLS model using four different samples: Sample 1 includes all CELs who took an ELA exam; sample 2 includes CELs in schools that had at least one segregated course (meaning there was variation in the Segregation variable for that school); sample 3 includes CELs who experienced both segregated and non-segregated classrooms; and sample 4 includes CELS who experienced both segregated and non-segregated classrooms while they were attending the same school. I also reproduce estimates from student, school, and student and school fixed effects models presented above.

Table C. 9 ***CEL Pooled Estimates of Segregated Class on ELA achievement***

Samples	Segregation Coefficient	Robust Standard Error	Sample Size
1. OLS	-0.20***	.04	147,925
2. Within School Variation: OLS	-0.20***	.03	88,218
3. School FE	-0.20***	.04	147,925
4. Students Switcher: OLS	-0.03	.03	11,153
5. Student FE	-0.00	.02	147,925
6. Students who switch in School: OLS	0.06*	.03	3,149
7. Student & School FE	0.02	.02	147,925

The OLS estimate of the effect of being in a segregated classroom on CEL ELA achievement estimated using the full sample is -.20 standard deviations, and is significant. When the sample is restricted to schools that exhibit variation in the segregation variable (Sample 2), OLS results are nearly identical. Results are also nearly identical when estimated using school fixed effects. Because the OLS and school FE estimates are essentially the same, we can surmise that the inclusion of school level variables in the OLS model adequately controls for non-random sorting between schools.

The results estimated using OLS diverge substantially for those estimated using models with student fixed effects or student and school fixed effects. When using a student fixed effect, the magnitude of the effect decreases to nearly zero and the effect is no longer significant. When using both student and school fixed effects, the estimated effect is positive and insignificant. Comparing the fixed effects estimates to the OLS estimates derived from the restricted samples shows that sample differences drive the differences in the estimated effects. That is, we can conclude that student fixed effects models do not produce different estimates because they are removing bias, but because they are derived using observations from a small and distinctive population of students. In sum, the effect of being in a segregated class is different for students who are switchers and the general population, and so the student fixed effects models do not produce results that are generalizable to the entire population.

Sensitivity Results Summary. The results presented in the bulk of the chapter are relatively robust to changes in the sample related to student exiters, stayers, and movers and the El measurement. The population of exiters, while significantly different than the population of stayers, is small enough that removing them form the sample does not substantially change conclusions. However, controlling for whether a student is an exiter is important in obtaining the most precise estimates. Changing the Experience threshold can impact results, but does so in a predictable way.

Understanding how the sample changes when estimating effects using fixed effects has important implications for interpreting results. While estimates using student fixed effects are not biased, they are not generalizable to the general population of Els. Estimates from models using student fixed effects or student and school fixed effects should be interpreted only as the effect of treatment on a very particular population of students in North Carolina. Still, for the purposes of this study, these estimates are preferred as they best capture a causal estimate of the effect of treatment on achievement.