ENGLISH LEARNER STUDENTS AND COLLEGE ACCESS IN THE U.S.: ANALYZING THIRTY YEARS OF EVIDENCE FROM THE NATIONAL SECONDARY SCHOOL LONGITUDINAL STUDIES

by

LEI JIANG

(Under the Direction of Linda Harklau)

ABSTRACT

English learner (EL) students are a quickly growing school-age population in most Anglophone immigrant-receiving countries. For example, they represent 10% of U.S. K-12 students. With an urgent need for a highly educated workforce, the ability of nations like the U.S. to effectively prepare EL students in schools has become an important agenda. However, a considerable gap exists between U.S. EL and non-EL students in college enrollment rates. While a substantive scholarship has focused on enhancing pedagogical practices for EL students, much less has examined EL students' access to higher education. In the decades since the passage of the *Bilingual Education Act* and *Lau v. Nichols* Supreme Court ruling, EL students and educators have experienced constantly shifting policy and demographic landscapes. However, little is known about how EL students' college access outcomes have been changed within the historical national backdrops and policy shifts.

This dissertation investigates how individual, family, school, and state contextual factors have contributed to U.S. EL students' variable performance compared to their non-EL peers. The study also examines if and how these outcomes and factors have evolved over the past three

decades. In this dissertation, I propose an integrated EL student college access model drawing from human capital theory, Bourdieusian theory of practice, and a five-stage college choice model. This study analyzes the three most recent nationally representative data sets from the NCES secondary longitudinal studies (HSLS:2009, ELS:2002, and NELS:1988) that include longitudinal educational surveys of students, their parents, and educators in the past three decades. Findings demonstrate that although EL students' college-going performance has improved over the past decades, a major achievement gap exists consistently between EL and non-EL students in terms of their college-going environments and outcomes. EL students have faced challenges from different contexts during their access to college, and these factors have also played different roles at different college access stages from college aspirations to college enrollments. This study provides implications for researchers, educators, and policymakers about effective practices that assist EL students' academic learning and high school-to-college transition.

INDEX WORDS: English learner students, college access, high school, national data sets, educational policy

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DEDICATION

This dissertation is dedicated to my parents.

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TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

English learner students[1] (EL students) have been among the fastest-growing school-age populations in the U.S. in recent decades (Office of Elementary and Secondary Education [OESE], 2019). However, a considerable gap exists in the college enrollment rates between EL and non-EL students. This dissertation investigates how individual, family, school, and state contexts have contributed to U.S. EL students' variable college access performance compared to their non-EL peers. The study also examines if and how these outcomes and factors have evolved over the past three decades.

In the U.S., EL students now represent approximately 10% of K-12 students nationwide, and the percentages are even higher in many school districts across the country (Cimpian et al., 2017; OESE, 2019). Over 1.72 million EL students are at the secondary level (National Center for Education Statistics [NCES], 2019). While they are often portrayed from a deficit-oriented perspective focusing exclusively on their limited English proficiency (Núñez et al., 2016), the heterogeneous group of EL students possess a diverse range of languages, cultural backgrounds, educational goals and needs, as well as academic and professional skills. How the U.S. can better prepare EL students to actively participate in schools, labor markets, and civil society has been an important agenda (Batalova & Alperin, 2018; Teranishi et al., 2013).

[1] I use the term "English learner (EL) students" to refer to multilingual students who are actively developing English language proficiency in addition to other (native) languages they speak and study at school. I use this term in part because "English learner" is an official federal classification (U.S. Department of Education, 2019). I also use "English learner/EL" as an adjective (e.g. "EL students") because I believe EL is only one aspect of these students' identities, and I acknowledge that this term does not fully reflect multilingual learners' comprehensive linguistic and cultural capital.

In contemporary U.S. society, higher education has played an essential role in providing knowledge and training that greatly benefit individual career development and social progress (Bok, 2013; Mayhew et al., 2016). Higher education also provides valuable opportunities for underrepresented students such as EL students to gain skills expected by the labor market, succeed in future professions, and contribute to national development. However, research has shown that a substantial education gap exists between EL students and non-EL students in high school graduation and higher education enrollment rates (Kanno & Cromley, 2013, 2015; Pew Research Center, n.d.), suggesting a need for additional scrutiny about institutional obstacles and individual challenges EL students may face in college enrollment.

While a substantive scholarship has focused on enhancing education for EL students, most research examines educational practices, especially English language teaching and learning practices, at the elementary and middle school levels (e.g., see Heritage et al., 2020; Walqui & Bunch, 2019; Wright, 2010; Ramirez et al., 2017). In comparison, only a handful of studies focus on EL students' high school academic preparation and access to college (e.g., see Callahan & Humphries, 2016; Kanno & Harklau, 2012; Núñez et al., 2016). Many of these studies have used qualitative methods to explore how various socioeconomic, academic, and linguistic contextual environments impact EL students' college access at the school, district, or regional level (e.g., see Harklau, 2011, 2013; Kanno, 2018; Kanno & Kangas, 2014). A growing body of research has recently provided findings of EL students' educational outcomes from analyzing nationally representative data sets (e.g., see Callahan & Humphries, 2016; Callahan & Shifrer, 2016; Kanno & Cromley, 2013, 2015; Núñez & Sparks, 2012). These studies have examined how different academic and socioeconomic factors in a given time period impacted immigrant and EL students' educational outcomes related to high school graduation and college access. In the

decades since the passage of the *Bilingual Education Act* and *Lau v. Nichols* Supreme Court ruling, EL students and educators have experienced constantly shifting policy and demographic landscapes. However, little is known about how EL students' college access outcomes evolved at these historical national backdrops and policy shifts. Addressing this gap in the literature can contribute to a deeper understanding of EL students' variable college enrollment as well as provide more targeted educational interventions for this student group.

This dissertation investigates how individual, family, school, and state contexts have contributed to U.S. EL students' variable college access performance compared to their non-EL peers. The study also examines if and how these outcomes and factors have evolved over the past three decades. In this dissertation, I propose an integrated EL student college access model drawing from human capital theory, Bourdieusian theory of practice, and a five-stage college choice model. This study analyzes the three most recent nationally representative data sets from the NCES secondary longitudinal studies (HSLS:2009, ELS:2002, and NELS:1988) that include students' academic records and longitudinal educational surveys of students, their parents, teachers, counselors, and school administrators in the past three decades. Findings demonstrate that although EL students' college-going performance has improved over the past decades, a major achievement gap exists consistently between EL and non-EL students in terms of their college-going environments and outcomes. EL students have faced challenges from different learning contexts during their access to college, and these factors have also played different roles at different college access stages from college aspirations to college enrollments. This study also provides implications for researchers, educators, and policymakers about effective practices that assist EL students' academic learning and high school-to-college transition. In what follows, I first provide a literature review to contextualize the research problem. Second, I introduce the

theoretical framework that guides the research. Next, I present the research methods and report the findings from the study. Finally, the dissertation discusses the conclusions and implications of the research.

CHAPTER 2

LITERATURE REVIEW

While research on EL students' transition from high school to college is still scant (Kanno & Harklau, 2012; Núñez et al., 2016), an epistemologically and methodologically diverse spectrum of research has been conducted to investigate EL students' college access experiences.

Trends of Research on Immigrant-Background EL Students' College Access

Since the late 1980s, a series of groundbreaking and solid qualitative studies, which primarily arise from the fields of second language education and sociology of education, have fundamentally framed and shaped our current understanding of how different socioeconomic, cultural, and educational factors impact immigrant-background EL students' K-12 academic learning and access to college. These factors include: (1) level of English language and literacy proficiency (e.g., Kibler et al., 2014; Ortmeier-Hooper & Ruecker, 2016; Ruecker et al., 2014) (2) family socioeconomic status (e.g., Kanno, 2018; Louie, 2004, 2012); (3) student race and ethnicity (e.g., Gándara & Contreras, 2009; Suárez-Orozco et al., 2008); (4) level of parental involvement (e.g., Harklau, 2013; Niehaus & Adelson, 2014); (5) school resources and community contexts (e.g., Portes & Rumbaut, 2001; Suárez-Orozco et al., 2008); (6) tracking and academic course taking (e.g., Harklau, 2007; Kanno & Kangas, 2014; Mosqueda, 2012); and (7) teacher and counselor support (e.g., Catalano et al., 2018; Dabach et al., 2018; García & Menken, 2014); and (8) state and federal policies (e.g., see Núñez & Gildersleeve, 2014; Vasquez Heilig et al., 2011). Most of these studies are site-specific, examining EL students'

college access in local schools and districts, and identifying and analyzing factors that are important within specific contexts.

Along with the development of these aforementioned studies, a growing body of research has started to examine nationally representative data sets that provide information about EL students' access to higher education at the national levels (e.g., Kanno & Cromley, 2013, 2015). Meanwhile, a variety of inferential statistical and econometric methods have increasingly been adopted by scholars in related educational fields to analyze district-level (e.g., Umansky, 2016a, 2016b) and national data sets (e.g., Callahan et al., 2010; Kim & Núñez, 2013; Núñez & Kim, 2012). Some of the studies investigate how several key factors, as identified by previous works, impact EL students' high school academic standing and college-going qualifications. For example, using multinomial regression analysis and the matching method to analyze the national data set of Educational Longitudinal Study of 2002 (ELS:2002), Callahan and her colleagues demonstrated the negative effects of the ESL placement on EL students' advanced academic course enrollment and cumulative GPA (Callahan & Humphries, 2016; Callahan et al., 2010; Callahan & Shifrer, 2016). Also, Umansky (2016a; 2016b) and Johnson (2019) used district-level data sets from California and adopted a quasi-experimental design with the regression discontinuity method for causal inference, and found that the institutional EL classification can can negatively impact EL students' K-12 learning, high school graduation, as well as college access.

In addition, other studies have used nationally representative data sets to examine how different factors play roles in EL students' college-going activities at different stages. For example, Kanno and Cromley (2013, 2015) used the National Education Longitudinal Study of 1988 (NELS:88) and ELS:2002 data sets, and adopted the multigroup analysis method to study

EL students' college-going behaviors and outcomes compared to their peers of English-proficient language minority students and native English-speaking students. With the data set of NELS:88, Kanno and Cromley (2013) compared EL students' two-year and four-year college enrollment rates and graduation rates with the other two student groups, and examined how their demographic characteristics, family capital, and high school factors impact postsecondary access and attainment outcomes. With the data set of ELS:2002, they (2015) studied high school EL students' and non-EL students' four-year college access performances; similar to their previous study, they also examined how EL students' demographic characteristics, family resources, and high school factors shape their four-year college access and attainment outcomes.

Factors that Impact EL Students' College Access

The research literature has identified several key factors that impact immigrant-background EL students' college access. These factors are discussed in the following subsections.

English Proficiency and High School Learning

According to the Migration Policy Institute (2019), in 2017 nearly 50% of foreign-born immigrants aged five or older self-reported limited English proficiency. Also, Batalova and Fix's study (2011) shows that for the immigrants who arrived in the U.S. at the age of sixteen or older, 80% of Latinx immigrants and 34% of other immigrants were limited in English proficiency; for the immigrants who arrived in the U.S. before the age of sixteen, 49% of Latinx immigrants and 18% of other immigrants were limited in English proficiency. Studies have also demonstrated that EL students are much less likely than students with full English proficiency to enroll in college (Kanno & Harklau, 2012; Klein et al., 2004).

Research has also suggested that many immigrant-background students encounter educational barriers during their pursuit of fluent English proficiency and achieve high academic outcomes, and thus are not well-prepared for college enrollment (Bunch & Kibler, 2015; Miller, 2010). Research shows that high school teachers and counselors might associate EL students' limited English proficiency with learning disabilities and lack of academic knowledge, which largely causes these students to be treated as academic underachievers who are not well prepared for college-level education (Rampton, 2017). Their multicultural and multilingual backgrounds, however, are not recognized as assets and values at schools. Also, many studies found that EL students, due to their limited English proficiency, face substantive obstacles in high schools that prevent them from further developing both their linguistic and academic skills, which would negatively affect their access to college (Callahan, 2005; Harklau, 2007). For example, Harklau's study (2007) pointed out that due to their limited language proficiency, EL students were usually placed in low-tracking courses without access to more advanced courses such as honor and Advanced Placement (AP) courses. They did not receive individualized and targeted mentoring and counseling services (especially on college and career advice), failed to receive proper scaffolding to prepare for mainstream English and language intensive classes (e.g., history and social studies), and were not provided with college-going test preparatory courses (e.g., SAT and ACT). Similarly, Kanno (2018) also stressed the significance of access to advanced level college-preparatory courses, knowledge about college and college planning and application, and confidence and competency about EL students' English proficiency. Moreover, Callahan and Humphries (2016) found that the widely perceived "immigrant advantage," which helps immigrant-background citizens gain success in education and career, only existed among non-

ESL students, and high-achieving EL students often ended up choosing "postsecondary options for which they are over-prepared" (p.263).

Furthermore, although high levels of English language proficiency are very important for EL students to prepare for college education, mastering the language alone is far from enough to qualify for college access (Kanno & Varghese, 2010; Rodriguez & Cruz, 2009). However, in spite of this evidence, many secondary schools prioritize English as a second language (ESL) courses over academic courses for EL students' study in schools, and these students are usually guided to spend most of the time learning English, sacrificing time for advanced academic core courses such as math, science, and other college-bound elective courses (Callahan, 2005). Therefore, by examining deficit-oriented ESL courses in K12 schools and language programs, scholars have called for reforms and advocated for more effective language courses and programs (e.g., content-based ESL instruction) that can effectively enhance EL students' linguistic and academic performance (Bailey & Santos, 2009).

Family Socioeconomic Status

Researchers have emphasized the heterogeneity within the group of immigrant-background students in the U.S. (e.g., see Louie, 2005; Ogbu, 1987, 1998; Portes & Raumbaut, 2001). Some immigrants, supported by their rich socio-cultural and financial resources, may voluntarily move to the U.S. to seek a better life; their goals can be achieved through obtaining high-quality K12, college, and post-graduate education, finding decent jobs, and securing satisfactory careers. Others, in contrast, may be forced to leave their home countries due to socioeconomic (e.g., unemployment or national economic breakdown) and political (e.g., refugees of domestic wars) reasons, arriving in the U.S. as unskilled manual workers to earn a living (Suárez-Orozco & Suárez-Orozco, 2001; Suárez-Orozco et al., 2008). These various backgrounds and trajectories of

immigration to the U.S. reflect different levels of immigrant families' socioeconomic status, such as family income and parental education (Stich & Freie, 2015). Their multicultural backgrounds and resources are acknowledged or overlooked at different levels by different aspects of society. Immigrant families with higher socioeconomic status, especially those who voluntarily choose to immigrate to the U.S., not only possess more economic capital, but also have more access to cultural, social, and educational resources (Mullen, 2009). For example, their children tend to attend elite K12 schools that prepare students well for college enrollment, receive high-quality educational resources from experienced teachers and counselors, and work with college-bound peers (Louie, 2004, 2012; Suárez-Orozco & Suárez-Orozco, 2001). Immigrant students whose parents have high educational attainment (such as a college degree or higher) are also able to receive guidance from their families to better navigate pathways to college (Núñez et al., 2016).

However, research studies demonstrate that overall EL students in the U.S. are more likely to come from families with lower than average socioeconomic statuses (Núñez et al., 2016). Although having lower socioeconomic backgrounds does not necessarily prevent students from attending college and achieving academic success (Toutkoushian, 2001), EL students with lower socioeconomic status indeed have limited access to social and academic resources as well as college-going information that are necessary for college enrollment (Bloom, 2007; Kanno & Varghese, 2010; Louie, 2005; Rodriguez & Cruz, 2009). For example, studies document that they are more likely to attend high schools that are under-funded and understaffed and thereby have limited resources about how to prepare for the college application process (Johnson & Stewart, 1991; Rodriguez & Cruz, 2009). EL students who are first-generation college applicants could also face larger barriers in college access processes compared to their peers (Núñez et al., 2016).

Student Race and Ethnicity

Studies have reported the unequal college-going rates among immigrant-background non-native English-speaking student groups by race and ethnicity. For example, Kanno and Cromley's (2015) study found that being a racial minority EL student was a significant negative predictor for EL students' college aspirations; more specifically, being Asian or Latinx was negatively associated with EL students' college-going outcomes. Baber and Graham (2015) found that, on average, Latinx and African immigrant students had lower college enrollment rates than other immigrant student groups. Among first-generation immigrant students, it was estimated by the Pew Research Center (n.d.) that in 2016, 52% of immigrants from South and East Asia had a college education, followed by those from the Middle East (47%), Europe and Canada (43%), and Sub-Saharan Africa (40%). Immigrants from Latin America had relatively lower college-educated population percentiles: 6% of immigrants from Mexico had a bachelor's degree, followed by those from Central America (9%), the Caribbean (20%), and South America (32%). Therefore, race and ethnicity need to be specifically examined as an indicator of immigrant-background EL students' academic achievement and college access.

Level of Parental Involvement

Students' college choice and college access involve not only individual efforts, but also support from parents and families. Research shows that parental support provides cultural and social resources for immigrant-background non-native English-speaking children (Gándara, 2002; Harklau, 2013; Zhou & Bankston, 1998). Parents who expect their EL student children to receive higher education are more likely to provide stable domestic support for their children to concentrate on academic learning. As a result, they also actively participate in their children's

college application processes, and ask their relatives, colleagues, and/or community members for information about higher education so as to better understand the contexts and mechanisms of college access (Bers & Galowich, 2002; Conley, 2001). The high expectations from parents, along with high levels of cultural and social capitals, can also assist their children in making college-bound academic plans and working hard to enhance their academic performance in schools (Louie, 2001).

School Resources and Community Contexts

The educational context wherein students are situated is one of the most important academic and social factors that impact students' access to college. Schools are the primary education sites where EL students receive knowledge, participate in educational and social activities, and build relations with teachers and peers. Schools with more socioeconomic resources, more well-established academic curriculum programs, and closer networks with universities are more likely to provide qualified college-preparation education, thus increasing the number of college-bound students (Engberg & Wolniak, 2010, 2011, 2014; Hamrick & Stage, 2004; Kim & Núñez, 2013; McDonough, 1997; Núñez et al., 2016; Perna, 2005). For example, Engberg and Wolniak's (2011) quantitative study found that academic preparation, college-linking resources, and college enrollment patterns among high schools peers were significant factors that influenced students' college-going behaviors, and these factors were also dependent on the high school's socioeconomic context, which were represented by schools' financial, social, and cultural resources.

Furthermore, researchers stress the significance of high school's collaboration with universities to provide more resources for culturally and linguistically diverse student groups such as EL students, and emphasize that high schools' partnership programs with universities

that prepare students for college application can increase students' opportunities to go to college (Calaff, 2009; Jarsky et al., 2009; Núñez, 2009).

Educators' Support

Teachers and counselors have significant influence on EL students' access to college (Louie, 2005; Reid & Moore, 2008; Wolniak & Rekoutis, 2016). The fields of second language acquisition and K-12 education have emphasized the essential role of educators in providing instructions and scaffolding that enhance EL students' language and academic study at high schools, which can largely determine their college predispositions and preparation (e.g., see Catalano et al., 2018; Dabach et al., 2018; García & Menken, 2014). Furthermore, EL students also need special and individualized advice from educators because of their multicultural and multilingual backgrounds as well as limited knowledge of U.S. K-12 and college educational systems (Harklau, 2007, 2011). For example, Cook et al.'s (2012) study shows that school counselors could facilitate Latinx immigrant students' college-going by cooperating with multiple stakeholders such as school teachers, college representatives, college pathway programs, and communities, addressing insufficient resources for student groups of special needs through advocacy, and recording data about high school graduation, college enrollment, and dropout rates. Also, Calaff's (2008) ethnographic study in a high school with nine Latinx immigrant students reported that high school educators could address students' needs by setting high expectations for students, broadening their access to academic rigor and technology, embracing cultural and linguistic diversity, and providing more supportive teachers and counselors.

State and Federal Policies

The accessibility and affordability of college education, both academically and financially, are impacted by state and federal policies (Long, 2004, 2013; Núñez & Gildersleeve, 2014; Núñez & Kim, 2012). Policies related to educational assessment and school performance can specifically impact EL students' academic achievement and college access. For example, Bunch and Panayotova (2008) reported that school systems' policies on English as a second language testing and placement negatively impacted EL students' learning motivations and academic performance. These high-stakes standard tests, if limiting students' access to other content-based college preparatory courses, can affect their linguistic and academic development, including their academic goals to attend college. Another example is the impact of state-mandated testing. Perna and Thomas (2009) found that state-mandated testing could bring unintended negative consequences and create barriers for college-aspirant students, especially those with lower socioeconomic status and lower academic achievements. On the other hand, many states have also passed educational and political policies that can benefit immigrant-background students' and other underrepresented students' access to college. For example, in 1997, Texas passed House Bill 588, which is widely known as the *Texas Top 10% Plan*. This act mandated that "all Texas high school students graduating in the top 10% of their class be granted admission to any Texas public college or university" (Vasquez Heilig et al., 2011, p. 110). Studies have confirmed that this act has positively impacted the immigrant-background, language minority student group and allow them to have more options during their college application and college choice processes (Lloyd et al., 2008; Vasquez Heilig et al., 2011).

Financial aid and scholarships can significantly benefit college-goers. While the governmental and institutional policies regarding college access, financial aid, and scholarships

are open to the public, EL students and families, especially those with lower socioeconomic status, often face linguistic (e.g., limited English proficiency to understand the legal terms), technical (e.g., limited skills using technology and online resources), and financial barriers (e.g., no computers, smartphones, or other searchable tools at home) to access the information (De La Rosa, 2006; King, 2004; Venegas, 2006). As a result, EL students often rely on their high school counselors, teachers, and other resources to understand the governmental and institutional policies on college enrollment and financial aid (Harklau, 2007; Zarate & Pachon, 2006). However, studies have shown that not every counselor understands all policies regarding immigrant-background EL students' access to college and financial aid, since complicated issues such as immigrant and resident status and their socioeconomic background of their students usually bring different and extra complex situations to them (McDonough & Calderone, 2004). As a result, EL students were unable to receive individualized suggestions and advice on applications to college, financial aid, and scholarships (Cabrera et al., 2004).

Moreover, the policies regarding college access and financial aid also concern the group of undocumented students, many of whom are EL students. The federal government first passed its legal act known as the *Higher Education Act of 1965*, which denied undocumented students' access to federal financial aid and scholarships. The following two related acts issued in the year of 1996, the *Illegal Immigration Reform and Immigrant Responsibility Act* (*IIRIRA-96*) and the *Personal Responsibility & Work Opportunity Reconciliation Act* (PRWORA), still did not open the door of federal loans and grants access to undocumented immigrant students, and did not positively encourage the open access of state loans and grants for undocumented students (Kim & Díaz, 2013). Although the 2011 version of the *Development, Relief, and Education for Alien Minors (DREAM) Act* and the *Deferred Action for Childhood Arrivals* (*DACA*) program in 2012

provide more substantial protection of undocumented students' access to college in the U.S., undocumented immigrant students' access to federal financial aid and scholarships are still not fully guaranteed (Kim & Díaz, 2013).

Gaps in the Literature

The current research literature has enhanced our understanding of EL students' college access outcomes as well as the specific contexts and factors that impact the results. Findings from these studies have also elaborated on the obstacles and opportunities that EL students encounter in their high school-to-college transition at the broader scope. Nevertheless, there are still some major gaps in the research literature that we need to fill in. In particular:

1. There is virtually no research on historical trends in EL students' college access experiences and college enrollment rates. This research is especially needed given the constantly shifting policy and demographic landscapes around immigrants (e.g., the *Immigration Reform and Control Act* in 1986 (*IRCA-86*) and *Illegal Immigration Reform and Immigrant Responsibility Act* in 1996 (*IIRIRA-96*)) and K-12 and language education (e.g., the *Bilingual Education Act* in 1968 and *No Child Left Behind Act* (NCLB) in 2001) over the past several decades;
2. While many studies have separately considered student and/or school characteristics that impact EL students' college access, very few have attempted to develop a more holistic model that traces their relative influence and effects on each other. Furthermore, few studies have taken the state contexts into consideration;
3. While one research study has closely focused on U.S. EL students' access to four-year colleges at the national level, little is known about their college access to other types of institutions at the national level;

4. Some access stages that have been found to be essential for non-EL college-goers, such as college search activities, have not been investigated in relation to EL students;
5. Qualitative research has emphasized some factors in EL students' college access (e.g., peer influence) that have not yet been widely investigated in quantitative studies.

In all, rigorous research using large-scale nationally representative data sets could provide us with a new means to address current gaps in the literature.

Research Questions and Hypotheses

The overarching research question that guides the study is: Based on nationally representative data sets, how have EL students' experiences and outcomes at key college access stages evolved over the past several decades, and how do they compare to those of their non-EL peers (i.e., English-proficient language minority students and native English speakers)?

Sub-questions that constitute the overarching research question include:

1. Are the learning environments and college-going outcomes among students with different linguistic statuses different, and if so, how much?
2. How have EL students' college access outcomes evolved across the past three decades (especially compared to the outcomes of their native English-speaking students)? Can any diachronic trends be discerned?
3. Are EL students' learning contexts (including individual and family backgrounds, school contexts, and state contexts) associated with their college experience outcomes, and if so, how?

Based on the findings of previous qualitative and descriptive studies, this study proposes the following hypotheses:

1. Compared to non-EL students, EL students have lower postsecondary school enrollment rates and more challenging learning environments; EL students are likely to have fewer resources and support in college access compared to their peers who are proficient in English;
2. EL students exhibit more robust college access achievements in the new decade than those in previous decades;
3. EL students' college access outcomes are impacted by factors at the individual and family, school, and state levels. These factors impact EL students' various college access stages differently.

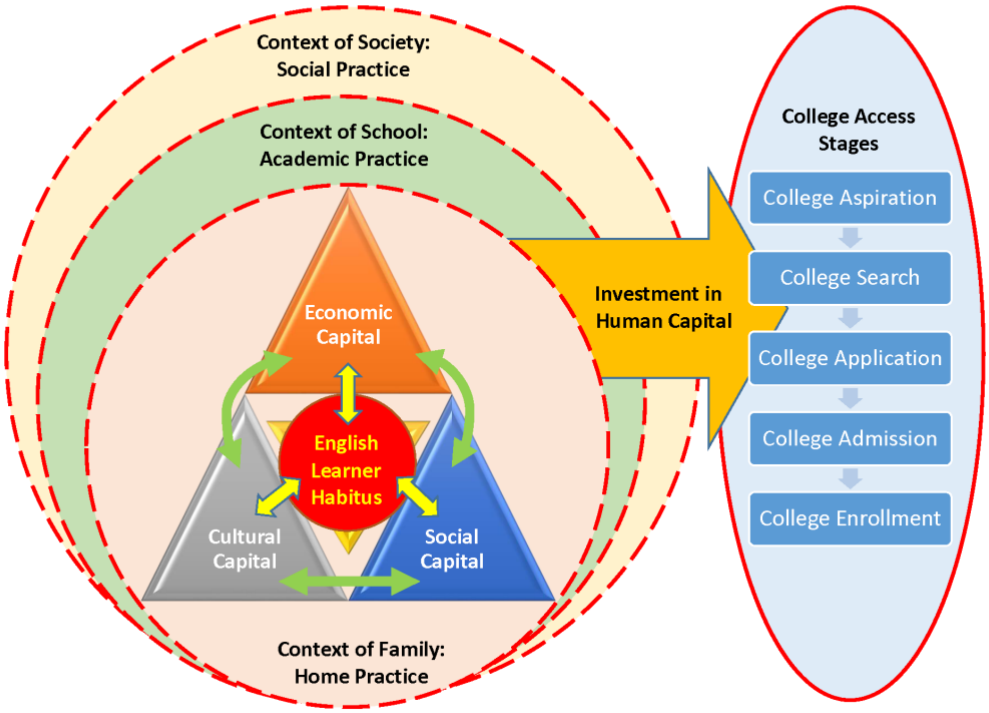
CHAPTER 3

THEORETICAL FRAMEWORK

To guide the research, I propose a transdisciplinary theoretical framework that integrates conceptual perspectives from human capital theory, Bourdieu's theory of practice, and college choice models. Figure 1 below presents the integrated model that guides the study to understand ELs' college access experiences. The following section discusses the three theoretical sources in detail, including how the integrated model is constructed based on these three sources.

Figure 1

An Integrated Model of English Learner Students' College Access Experiences



Human Capital Theory

Human capital refers to the attributes of an individual, such as one's knowledge, skills, health, and abilities, that can produce value in society and bring income for individuals (Becker, 1962, 1993). Originating in the economic thoughts of Adam Smith in the 18th century, the modern concept of human capital was primarily developed to address the worldwide concern on the investment in education, namely whether using limited personal and social resources to invest in education brings positive outcomes both for the individuals and the society (Becker, 1993; Murnane & Willet, 2011). In the 1960s, three renowned economists, Gary Becker, Theodore Schultz, and Jacob Mincer, proposed the conceptual framework of human capital and explored the role of education in the labor force market (Paulsen & Toutkoushian, 2008). Other economists have further enriched this theoretical foundation, which became known as human capital theory, and used it to guide quantitative research on the economics of education and labor economics (Lovenheim & Turner, 2017). Since the late 1980s, human capital theory has become widely adopted by scholars, policymakers, and practitioners in fields such as economics, education, and public policy.

While human capital is often associated with education (especially formal schooling), its conceptual connotation surpasses the idea of education. For example, Michael Jackson, one of the most influential artists in history, graduated from Montclair College Prep School and never completed high school; but during his lifetime, he possessed among the highest levels of human capital with his talent in music. Therefore, human capital is represented in different forms and comes from various sources such as formal schooling, informal training, health, family background, and social and financial resources (Becker, 1993; Gathmann & Schonberg, 2010). However, people like Michael Jackson are indeed rare among the 7.5 billion people worldwide,

and most of us gain our human capital through formal schooling. Therefore, receiving education is one of the most effective ways to gain high levels of human capital (Becker, 1993; Lovenheim & Turner, 2017). The concept is thus used to analyze economic issues about education, leading to the development of contemporary human capital theory.

The basic tenet of human capital theory explores the cost and benefit analysis of one's investment in education. More specifically, it provides a theoretical lens to understand how individuals decide on their investment on the levels of their schooling that can expectedly contribute to higher profits they gain from the labor market in the future (Becker, 1993; Johnes, 1993; Woodhall, 1995). Investment in education can strengthen individuals' abilities and enrich their knowledge, thus enhancing their human capital with an increased likelihood of improving health, raising productivity, and earning higher incomes. In contemporary society, attending college can largely enhance one's occupational prospects and overall life quality. Students gain knowledge and skills through attending college as an investment. With the accumulation of these attributes, they obtain higher levels of human capital, increasing their probability of accessing higher status occupations and higher salaries. Human capital theory highlights that an individual's decision on whether to continue their education depends on one's total budget constraint and preferences, and the net benefits of education they receive. In terms of higher education, students' net benefits of education refer to the total benefits they gain from attending colleges (e.g., the higher income they earn as college graduates) after deducting the total costs they have to pay for (e.g., the tuition and fees of attending colleges, and the earnings students could receive should they work directly after high school graduation instead of going to college). Therefore, human capital theory helps explain the rationale behind students' decisions about

attending college. In Figure 1, the orange direction arrow and the content it points to highlight students' decision-making procedures regarding their investment in human capital.

In order to rigorously analyze and model students' college-going behaviors under the framework of human capital theory, economists of education rely on both disciplinary knowledge and analytical tools. Rational choice theory is prominent in this field. It assumes that students rationally make college-going decisions by collecting information exhaustively, considering their budgets and preferences carefully, and weighing the benefits and costs wisely so as to maximize the utilities they gain (DesJardins & Toutkoushian, 2005; Toutkoushian & Paulsen, 2016). Specifically, social scientists use econometric and statistical techniques to model the costs and benefits of financial investment in education. For example, using the present value formation (Becker, 1993; Lovenheim & Turner, 2017; Paulsen & Toutkoushian, 2008), a simplified mathematical presentation of the net benefits of attending college can be constructed as:

$$N = \sum_{t=5}^{T} \frac{Y_t^C - Y_t^H}{(1+r)^t} - \left(\sum_{t=1}^{4} \frac{C_t^C}{(1+r)^t} + \sum_{t=1}^{4} \frac{Y_t^H}{(1+r)^t} \right) \quad (1)$$

Here N represents the net benefits. T denotes the total number of working years, with t representing the typical year t. Y_t^H and Y_t^C refer to one's incomes with high school education and college education in Year t. C_t^C denotes the cost of attending a college in Year t, and r stands for the market interest rate. Therefore, $\sum_{t=5}^{T} \frac{Y_t^C - Y_t^H}{(1+r)^t}$ represents the increased part in the income one gains due to the college education, while $\sum_{t=1}^{4} \frac{C_t^C}{(1+r)^t} + \sum_{t=1}^{4} \frac{Y_t^H}{(1+r)^t}$ represents the direct and indirect financial cost of attending a typical college. Put together, this formula stands for the net benefits of attending a college: a rational student would choose to attend a typical college when it is larger than 0; otherwise, one would directly go to work after high school graduation. In real

situations, other formulas with similar approaches need to be co-constructed in order to include and compare other important variables such as internal rate of return, individuals' total budgets, and loans and grants one receives.

Methodological analysis using human capital theory is also supported by market analysis, including approaches such as the modeling of supply and demand in the market of higher education (Becker, 1962, 1967, 1993; McMahon, 1991; Mincer, 1993), and marginal analysis (Paulsen & Toutkoushian, 2006, 2008). Market analysis is not only useful for understanding individual choice, but also essential for policy decision-making (Long, 2007). Under this analytical framework, students always aim to maximize their utilities, or net benefits, by optimizing their constrained budget (such as money and time). Here, the equilibrium lies where utilities meet budgets and where the supply amount equals the demand amount. Furthermore, in parallel to the philosophy of differential calculus, due to the practical significance of the incremental shifts over the total changes in amounts, economists focus on students' decision-making behaviors regarding investment in college at the marginal level (Toutkoushian & Paulsen, 2016). More specifically, students are expected to decide on whether to enroll in college, which college and major to choose from, and whether to complete college education by comparing the marginal benefits they can gain and the marginal cost they have to pay for at the typical decision-making point. Students will adopt pro-college-going behaviors as long as its marginal benefits are larger than the marginal costs.

However, economists have also maintained that this rationally-based human capital model cannot be applied for each student and family with a *one-size-fits-all* assumption; instead, different student groups have varying resources for and payoffs from their investment in education (Becker, 1962; Mincer, 1993). For one thing, not everyone can afford the investment

(e.g., college tuition and mandatory fees) as expected by institutions and society to achieve desired outcomes, and the investment in human capital is indeed constrained by the individual, family, and academic resources one possesses (Becker, 1962; Schultz, 1961). For another, the same amount of investment devoted by different social groups in terms of resources in high school study and college access, the process of which is demonstrated across different levels of the circles in Figure 1, can lead to a variety of different outcomes (e.g., four-year college with different levels of selectivity, two-year college, dropout, etc.). Different demographic, socioeconomic, and cultural factors impact the abilities and payoffs of the college access behaviors, favoring some social groups over others. This stratification leads to the second conceptual perspective that this study draws upon.

Bourdieu's Theory of Practice

Widely known as a critical sociologist and philosopher, Bourdieu conducted empirical research on topics related to education, society, culture, and knowledge during the twentieth century. His scholarly passion and expertise are rooted in his life experiences (Grenfell, 2012). Born in a village in Southern France and speaking Gascon (a now dead regional language), he first attended schools in the local towns, and then moved to an elite high school in Paris and completed his college education in École Normale Supérieure (ENS). This linguistically and academically diverse educational trajectory, which somewhat resembles that of an (im)migrant multilingual student, provided him with first-hand experiences of social inequality and stratification within formal schooling (Bourdieu, 1977a, 1977b; Bourdieu & Passeron, 1990; Grenfell, 2007, 2012). Together with his ethnographic studies (e.g., in Algeria and France) and his active involvement in social movements, his experiences inspired him to study the procedures

of reproduction in education, society, and culture as his core research interests in his prolific academic life.

Bourdieu advocated for the integration of theory and practice in social sciences (Bourdieu, 1971; Robbins, 2012). His theory of practice combines both theoretical analysis and empirical practice to investigate social agents' activities in specific social spaces (Bourdieu, 1977a; Bourdieu & Wacquant, 1992). Three well-known concepts constitute the key foundations of Bourdieu's theory of practice: habitus, capital, and field.

First, habitus refers to the disposition of an agent in society, which is structured by the agent's former experience and also structures one's future practice. Habitus emphasizes the connections, interactions, and conflicts between the subjective and objective, between one's inner and outer contexts, as well as between agency and structure (Bourdieu, 1977a). Second, Bourdieu proposed his notion of capital to "refer broadly to any socially valued resource" (Medvetz & Sallaz, 2018, p. 11). His framework extended the traditional concept of capital (i.e., economic capital) and emphasized symbolic capital, especially in its two forms: cultural capital, and social capital. Cultural capital encompasses individuals' resources inherited from their families and communities, which assist them in achieving academic and professional success in society. Social capital represents the social resources one accumulates through interactions with other social members in society. Finally, the Bourdieusian concept of field means "social space in which interactions, transactions, and events occur" (2005, p.148).

While these three concepts have been widely applied in the field of education, many Bourdieusian scholars point out that studies have often selected one of these concepts as a theoretical guide to interpret social phenomena (e.g., see Grenfell, 2012; Maton, 2012). They maintained that the concepts of habitus, capital, and field are constitutive rather than separable,

and the theoretical relations among these concepts are also part of the theory of practice (Horvat, 2001; Nash, 1999; Jiang, 2020). In other words, they are three foundational aspects of one theory. With this tripartite conceptual framework, Bourdieu investigated how individuals conduct their practices in different social contexts wherein they are situated, and to understand how interactions occur between the traditionally perceived social binaries (e.g., agency/structure and subjectivism/objectivism) in fields such as education, culture, and politics (Murphy & Costa, 2015). In fact, using Equation (2) below, Bourdieu (1986) himself synthesized the relation of these three concepts in the theory (p. 101):

$$[(\text{Habitus})(\text{Capital})] + \text{Field} = \text{Practice} \quad (2)$$

As Maton (2012) explains, this equation shows that "practice results from relations between one's dispositions (habitus) and one's position in a field (capital), within the current state of play of that social arena (field)" (p. 50). The Bourdieusian framework reminds educators that besides their individual efforts, students of different demographic and socioeconomic groups possess different social positions within schools, which would stratify their academic attainments and contribute to the educational and social stratification.

This dissertation research focuses on EL students' habitus and capital as well as the impact of their practice in the field of college access experiences. Bourdieusian theory emphasizes that EL students' college enrollment outcomes should be associated with not only their individual efforts, but also factors from their family backgrounds, schools, and the larger social environments that they are situated in. Therefore, perspectives of multiple aspects should be adopted to understand their college access practice. In Figure 1, the three different circles stand for the contexts of family, school, and society, and the dash lines of the circles emphasize that contexts of different levels interact with each other through individual and institutional

practices. Within the three contextual circles, the core circle features EL students' habitus, which connects with their capital denoted by the triangles. Situated within different layers of contexts, EL students' habitus both structures and is structured by the changing capital they possess; meanwhile, as Bourdieu indicated the conversion among different forms of capital, this aspect is also reflected in the model through the curved arrows between economic, cultural, and social capital.

Since EL students are more likely to come from families who have lower socioeconomic status, immigrant backgrounds, and racial and language minority backgrounds (Kanno & Cromley, 2015; Núñez et al., 2016), EL students' habitus and levels of symbolic capital can be different from their non-EL peers as well as the dominant field power of the educational institutions and contexts in which they are situated. This indicates that EL students with similar academic aspirations, attitudes, and efforts may end up having different educational outcomes than their peers due to variations in individual habitus and capital. According to Bourdieu, institutional and social structures always favor cultural capital that is consistent with their dispositions, and thus social agents who possess this type of cultural capital are usually in more advantageous positions than those who do not (Bourdieu, 1971, 1977a, 1977b; Bourdieu & Wacquant, 1992). Therefore, although many EL students possess home languages and cultural knowledge that are embraced as diverse linguistic and cultural capital within their families and co-ethnic communities, their English skills may be the only recognized form of linguistic capital in the field of formal schooling. Moreover, Bourdieu demonstrates that social capital is institutionalized (Grenfell, 2012). This implies that societal newcomers and underrepresented students are more likely to have unstable and loose social relations with educators and peers at schools and communities, which can weaken their social capital and cause obstacles in achieving

higher educational attainment. EL students can also encounter obstacles to develop social capital when their communication between educators and non-EL peers is of lower academic quality. Consequently, EL students could face unconventional and invisible challenges, and their efforts and investment in education may or may not receive the expected payoffs that can earn them progress to the improved human capital and college-going credentials.

College Choice Models

To better understand the specific college access procedures that EL students undergo, this study draws upon the conceptual frameworks from college choice models. Researchers in higher education have proposed a series of college access and choice models that synthesize students' academic learning and college application experience in the U.S. (e.g., see DesJardins et al., 2006; Hossler & Gallagher, 1987; Long, 2007; Perna, 2006; Toutkoushian & Paulsen, 2016; Welton & Martinez, 2014). One of the foundational and influential models was proposed by Hossler and Gallagher in 1987. In their model, they divide the process of students' college choice and access into three stages: predisposition, search, and choice. This model assumes that students and their families rationally make full use of their resources to: collect information in each stage, compare options that maximize their current and future benefits in schools and markets, and make decisions to go to college. Recently, building on the earlier college choice models, Toutkoushian and Paulsen (2016) further proposed a five-stage model. In this model, they demonstrate that in order to attend college, high school students go through the processes of predisposition, initial search, application, admission, and enrollment. By incorporating the three major phases emphasized in earlier models, this model further includes two complicated and significant procedures: application and admission.

The five-stage model provides helpful guidance in understanding high school students' college access. It delineates students' college access experiences from aspirations to enrollment comprehensively, highlighting the significant and unique roles the five essential phases play. Meanwhile, students' plans and resources for college access can be constrained by different aspects and at different temporal stages. Therefore, a closer specification and examination of the college access stages, especially their college applications and admission outcomes, can provide additional information about their performance and the recognition they receive from the institutions. With the help of this model, the analysis of this study can go beyond merely looking at students' destinations after high school graduation but investigate students' preparation for high school-to-college transitions at different phases. The right end of Figure 1 incorporates the essence of the five-stage model and presents the phases that EL students undergo to achieve higher education.

Meanwhile, researchers from the field of higher education also suggest that the demographic and social structural shifts in recent decades have also brought changes in the college-going populations in the U.S. One of the changes in the demography of college-bound U.S. students is the rise of immigrant-background and non-native English-speaking students, including EL students (Callahan & Humphries, 2016; Harklau, 1998, 2011, 2013). Immigrant students have unique social identities such as diverse multicultural backgrounds, multilingual traditions, and various immigration experiences and trajectories (Bergeson, 2009; Museus et al., 2016). For example, most first-generation EL students lack knowledge about the K-12 education system and college application procedures in the U.S. (Bergeson, 2009; Kim & Díaz, 2013). Their knowledge about college choice may in some cases be constrained to the fragmentary information they have learned from their peers and communities (Suárez-Orozco et al., 2008).

EL students not only need to pursue high academic achievements, but also have to simultaneously face potential challenges such as linguistic barriers, cultural differences, racial discriminations, and their lack of knowledge about pathways to future careers (Harklau, 1998, 2011; Suárez-Orozco et al., 2008). Therefore, EL students may have different college-going experiences than the more traditionally studied college-going populations; also, the dominant important factors that are identified by classical college access models to impact students' college enrollment outcomes might not be the same as those that influence EL students' college-going performances (Bergerson, 2009). To this end, while this study adopts the five-stage college access model to guide the inquiry, it also emphasizes EL students' identifies and backgrounds to understand their college access experiences.

Theoretical Implications for EL Students' College Access

The transdisciplinary philosophical orientation draws on each of these theoretical perspectives. First, I draw upon human capital theory to emphasize the significance of investment in education and students' decision-making regarding higher education from the economic perspectives. Next, I rely on Bourdieu's theory of practice to gain sociological insights into EL students' dispositions and social relations. Bourdieusian perspectives also provide guidance on how these factors influence EL students' access to college, and how the variable resources they possess contribute to the unequal and even skewed educational outcomes after high school graduation. Finally, the five-stage college choice model expands the investigation into EL students' college-going preparations and specifies the milestones that college-bound EL students experience during their high school-to-college transition. Together, these constructs provide a comprehensive framework for researchers to understand the assets, efforts, challenges, and barriers of EL students through their pursuit of a college education.

Synthesizing across these frameworks, I propose this integrated model of EL students' college access experiences. At the core of this model is the EL student, and their habitus as well as their economic, cultural, and social resources (capitals). They are first situated within the context of family. Their habitus (dispositions and habits) is first influenced by family and home practices. Moving outward, they are also situated within the context of school. They develop linguistic, academic, and social skills as they interact with and learn from their teachers, counselors, school administrators, and peers. On the other hand, they can also face challenges such as discrimination against their minority identities (e.g., linguistic, racial, and cultural, etc.), which can affect their access to academic capital. Next, they are situated within the context of U.S. society, and their lives and studies are also impacted by local, state, and federal policies, laws, acts, and regulations. Once EL students hope to invest in their human capital, or pursue higher education, they need to go through the five stages of college access in order to enroll in college. This integrated model of EL students' college access experiences guides the design and implementation of this research study.

CHAPTER 4

RESEARCH METHODS

Data Sources

This dissertation uses multiple data sets to address the research questions. The data sets are from the most recent three NCES secondary longitudinal studies: the National Education Longitudinal Study of 1988 (NELS:88), the Education Longitudinal Study (ELS:2002), and the High School Longitudinal Study of 2009 (HSLS:09). These data sets consist of longitudinal surveys and collections of nationally representative academic records and responses from high school students, parents, teachers, counselors, and administrators over the past three decades (from 1988 to 2018). Providing student information from high school attendance to early career and work roles, the data sets contain comprehensive information about students' high school experiences to college transition at the national level. They are uniquely suited to investigate the research questions about EL students' college access performances at the national level under shifting immigrant and ESL education policies in recent decades. Furthermore, the three data sets have captured student learning outcomes under the evolving federal education and immigrant acts. NELS:88 captured the legal and policy contexts of the post-*Bilingual Education Act* era, including the Supreme court's decisions on the *Castañeda v. Pickard* case (1981) that established assessments to make bilingual education programs accountable, and the *Plyler v. Doe* case (1982) that decided states cannot deny students free access to public K-12 schools based on immigration status. ELS: 2002 documented students' learning outcomes in a society with

shifting immigration policies (from *IRCA-86* to *IIRIRA-96* for immigrants). HSLS:09 represents students' learning contexts after the passage of the *No Child Left Behind Act* (NCLB) in 2001.

The data sets include pertinent variables for this study, which include (but are not limited to) students' individual demographic characteristics (e.g., race and ethnicity, and linguistic background), family characteristics (e.g., family income, and parental involvement), school characteristics (e.g., school type, and characteristics of the student population), and student academic preparation and performance (e.g., high school transcript and course records, cumulative GPA). In addition, the study further examines state-level characteristics, including (1) geographic location of the high schools as provided by the data sets; and (2) the state immigration context, which I divided into three categories based on the criteria set by Terrazas (2011): established immigrant destinations (EIDs), new immigrant destinations (NIDs), and other states that are not established/new immigrant destinations. According to Terrazas (2011), the following seven states are established immigrant destinations: California, Florida, Illinois, Massachusetts, New Jersey, New York, and Texas. The following fourteen states are new immigrant destinations: Alabama, Arkansas, Delaware, Georgia, Idaho, Indiana, Kentucky, Mississippi, Nevada, North Carolina, South Carolina, South Dakota, Tennessee, and Wyoming. The rest of the states are not established/new immigrant destinations.

Furthermore, despite some minor logistic deviations, NCES has deliberately unified the designs, instrumentations, data collection methodologies, and data processing for its secondary longitudinal studies programs, making the three studies closely comparable (Ingels et al., 1990; Ingels et al., 2004; Ingels et al., 2011). In fact, scholars have used multiple NCES data sets to study the historical and diachronic trends of high school students' learning outcomes at the national level. For example, using four data sets from the NCES secondary longitudinal studies

programs (including NELS:88 and ELS:2002), Ingels and his colleagues (2008) published a descriptive report of the learning and life trends among high school seniors from 1972 to 2004.

Rationale of Methods

Analytic Weights and Variance Estimation Methods

To ensure the quality of the survey estimates in the longitudinal, large-scale, nationally representative data sets, it is essential to properly examine variance and bias. All three NCES data sets provide analytic weights for variance estimation and nonresponse bias analysis. These NCES analytic weights must be selected and added to the original data sets for inferential analysis.

For the variance estimation, two methods are available for these three NCES data sets: balanced repeated replication (BRR) and Taylor series linearization (TSL). Both BRR and TSL are statistical methods for variance estimation with data from stratified samples (Lavrakas, 2008). Compared to TSL, BRR weights "capture additional random variability associated with, for example, the weight adjustments applied to the base weight to construct the analytic weight," and thus BRR variance estimates are "slightly larger in value than those produced through a linearization methodology" (Ingels et al., 2011, p. 132). Therefore, the method of BRR is recommended over TSL for variance estimation by NCES (Ingels et al., 2011), and this study uses the method of BRR for variance estimation.

The formula for calculating a BRR variance estimate is provided below:

$$Var(\hat{\theta}) = \frac{1}{R}\sum_{r=1}^{R}\left[\hat{\theta}_{a_r} - \hat{\theta}\right]^2 \quad (3)$$

where R is the number of the BRR weights from each data set, $\hat{\theta}$ is the estimated value of a statistic with an analytic weight that is appropriately chosen from the NCES data set, and $\hat{\theta}_{a_r}$ is the value with the ath BRR weight (where a = 1, 2, …, R).

NCES also requires that researchers add appropriate analytic weights to the data sets for their research studies. For example, researchers who are primarily interested in studying individual students' academic outcomes should use student analytic weights; school analytic weights are needed if researchers want to study the school-level outcomes. Because this study focuses on individual students' learning experiences, a series of student analytic weights are used for the three data sets to study high school EL and non-EL students' college access: W4W1W2W3STU for HSLS:09, F2BYWT for ELS:2002, and F3TRSCWT for NELS:88. These three weights are all student analytic weights provided by NCES for the data sets and take into consideration the information from the follow-up survey results.

Inferential Methods

In this study, I build statistical models to examine the relations between response variables (or dependent variables) and explanatory variables (or independent variables). Because the response variables are discrete data, classical linear models (CLMs), which are statistically powerful to fit unlimited and unrestricted data, are not primarily applicable to fit such data. Therefore, I use generalized linear models (GLMs), which broaden the class of CLMs for statistical modeling that can work with the data in the NCES data sets (Agresti, 2013; Fahrmeir & Tutz, 2001).

In CLMs, we assume that for a model:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \cdots + \beta_p X_{pi} + e_i, \qquad i = 1, 2, \ldots, n \tag{4}$$

where Y_i is a response variable, X_{pi} is an explanatory variable, β_p is the coefficient, and e_i is the random error.

There are two components in the model, a systematic component and a random component. The systematic component is:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \cdots + \beta_p X_{pi}, \qquad i = 1, 2, \ldots, n \tag{5}$$

Or in the form of matrix, it can be expressed as:

$$\boldsymbol{\eta} = \mathbf{x}^{\boldsymbol{T}}\boldsymbol{\beta} \tag{6}$$

The random component or the errors is noted by e_i; in standard linear models we assume that e_i are normally distributed where $e_i \sim (0, \sigma^2)$. With e_i, we can understand that $Y_1, Y_2, \ldots Y_n$ are independent if e_i are independent, and $Y_i \sim (\mu_i, \sigma^2)$.

Furthermore, for CLMs we assume that $\mu_i = \eta_i$ for all i.

As a generalized form of CLMs, GLMs have a systematic component and a random component as well.

The systematic component is:

$$\boldsymbol{\eta} = \mathbf{x}^{\boldsymbol{T}}\boldsymbol{\beta} \tag{7}$$

The random component is that $Y_1, Y_2, \ldots Y_n$ are independent random variables, each with the expectation as:

$$E(Y_i) = \mu_i \tag{8}$$

and with the density as:

$$f_Y(y_i; \theta_i, \phi) = \exp\left\{\frac{y_i\theta_i - b(\theta_i)}{a_i(\phi)} + c(y_i, \phi)\right\}, \tag{9}$$

where θ_i is the location parameter as well as a transformation of μ_i, ϕ is a scale parameter. This probability density function in Equation (9) represents one of the exponential dispersion families

of distributions. The family includes many common distributions such as the normal distribution, binomial distribution, Gamma distribution, and multinomial distribution.

Different from CLMs, in GLMs, the link between the systematic component and the random component is:

$$\eta_i = g(\mu_i) \tag{10}$$

where μ_i is often restricted (e.g., the discrete data in our study), η_i is unrestricted (e.g., continuous data), and the link function $g(\mu_i)$ transforms the μ_i, which makes $g(\mu_i)$ an unrestricted one.

Accordingly, to solve the equation and get the mean μ_i, we will have

$$\mu_i = g^{-1}(\eta_i) \tag{11}$$

where $g^{-1}()$ is the inverse link.

In these cases, the respective links, known as the canonical link ($\theta_i = \eta_i$) should be used in the models. The links that are commonly used are included in Table 1 (Agresti, 2013). For this research study, because the response variables used in the models are binary data, I chose the logit link to analyze the data and building the model. When the logit link is selected for GLMs, the statistical model is also widely known as the logistic regression (or "logit regression").

Table 1

Common Link Functions Used in GLMs

Outcome Type	**Outcome Distribution**	**Link Name**	**Link Function**	**Inverse Link Name**	**Inverse Link**
Continuous $Y \in \{-\infty, +\infty\}$	Normal	Identity	$\eta = \mu$	Identity	$\mu = \eta$
Dichotomous $Y \in \{0,1\}$	Bernouli	Logit	$\eta = \log(\frac{\mu}{1-\mu})$	Expit or Inverse Logit	$\mu = \frac{e^{\eta}}{1+e^{\eta}}$
Count $Y \in \{0,1, \ldots i\}$	Binomial	Logit	$\eta = \log(\frac{\mu}{1-\mu})$	Expit or Inverse Logit	$\mu = \frac{e^{\eta}}{1+e^{\eta}}$

Count $Y \in \{0,1,\dots\}$	Poisson	Log	$\eta = \log(\mu)$	Exponential	$\mu = \exp(\eta)$
Ordinal $R \in \{1,2,\dots M\}$	Multinomial	Cumulative Logit	$\eta = \log\left(\frac{\mu}{1-\mu}\right)$, where $\mu = \text{Prob}(R \leq m)$		
Nominal $R \in \{1,2,\dots M\}$	Multinomial	Multinomial Logit	$\eta = \log\left(\frac{\text{Prob}(R = m)}{\text{Prob}(R = M)}\right)$		

Statistical Software and Package

To conduct the statistical analysis, R software was used for statistical computation. The *survey* package (Lumley, 2020) was mainly used to add the analytic weights to the data, maintain the original NCES survey design, and build the GLMs.

Samples: Identification of EL, EP, and NE Students

To align with the inquiry from the research questions, this study classifies students into three subgroups in each data set: EL students, English-proficient language minority students (EP students), and native English-speaking students (NE students).

The three NCES data sets do not have unified criteria to identify who the EL students were and who were not at high schools. Multiple sources exist in these data sets to test students' English proficiency, such as students' self-reports of their English proficiency (e.g., NELS:88 and ELS:2002), teachers' recognition of whether a student was an EL student (e.g., NELS:88 and ELS:2002), and responses from parents about whether their child was ever in an ESL or bilingual program (e.g., HSLS:09).

However, there are also some limitations in these established sources. First of all, many reports from students and teachers about the respondents' English proficiency were based on their subjective evaluations or impressions rather than official school classifications, which vary across survey participants. Second, the survey question about whether a student was in an ESL or bilingual program included positive responses from parents whose children were native English speakers with fluent English proficiency but enrolled in high school bilingual programs for both

native and non-native English-speaking students, such as dual language immersion programs. Furthermore, the sources for the classification of EL students are not consistent across the three data sets. Due to these reasons, research has reported that merely relying on these criteria cannot accurately identify high school EL students (e.g., see Callahan & Humphries, 2016). Therefore, a unified, objective approach is needed to identify EL students in these three data sets, especially for the comparison of outcomes from multiple cohorts.

Inspired by Callahan and her colleagues' work (e.g., see Callahan et al., 2010; Callahan & Shifrer, 2016), this study used high school transcript data to identify EL students. The follow-up surveys from the three data sets provide nationally representative student participants' high school transcripts, which include more than 2.3 million course titles in total. The high school transcripts list key information about the courses taken by students, such as the student IDs, course names, and grade levels. In addition, each course is assigned a classification code (Classification of Secondary School Courses code, or CSSC code, for ELS:2002 and NELS:88; and School Courses for the Exchange of Data code, or SCED code, for HSLS:2002), which is primarily used to identify the subject of a course.

Therefore, this study mainly used these two sources to identify if a course is an English as a Second Language (ESL) course: the course classification code and the course name. First, a course was identified as an ESL course if it received a code for "English as a Second Language" or "transitional English." However, some of the courses, which were primarily designed for EL students, were not assigned these codes. For example, a sheltered course or a content-based course that helps EL students develop both language and academic knowledge was usually assigned a code that reflected its primary subject (e.g., math and science). Therefore, I also used the course names to identify ESL courses. Based on the literature about ESL and bilingual

education research (e.g., Callahan et al., 2010) as well as consultation with current in-service high school ESL teachers, I identified a course as an ESL course if the course name contained one or more keywords from the following five categories: first, English learner/English language learner or EL/ELL (e.g., United States history for English learners, English learner level 3, and Language Arts for English learners); second, English as a second language/English to speakers of other languages, language development, or ESL/ESOL (e.g., ESOL 2, ESOL 3, language development 2, and English proficiency development); third, sheltered/content-based (e.g., sheltered mathematics, specially designed academic instruction in English, sheltered English instruction); fourth, bilingual (e.g., pre-algebra for bilingual learners, and United States history for bilingual learners); and fifth, other keywords that are associated with English learner students (e.g., newcomers' English). Based on the criteria, I used R to identify if a course was ESL or not. In total, 3430 ESL courses were identified in HSLS:09, 3690 in ELS:2002, and 2170 in NELS:88[2].

Next, I used these ESL courses to group the students in terms of their linguistic statuses. The first group was EL students, who took one or more ESL courses at high school. The second group was language minority students who are proficient in English (EP students). These are the students who answered that English is not their native language or not their sole first language to the survey question about their language background, but they did not have any ESL courses listed on their high school transcripts. The third group is native English-speaking students (NE students). These are students who answered that English is their only native language in the survey questions, and they did not have any ESL courses listed on their high school transcripts either. While using these criteria, I also acknowledge that these categories only exist to help us

[2] Per the request of the NCES, these and other unweighted sample size numbers in this dissertation are all rounded to the nearest ten. This principle applies to the descriptions, tables, and figures that present unweighted sample sizes in the dissertation.

understand how EL students performed academically during their high school-to-college transitions. They are contextualized in this particular study and should not be advocated or promoted for other purposes.

Table 2 below lists the student sample sizes (without adding the analytic weights) and the proportions (after adding the analytic weights) of the three student groups for the three data sets. As the table shows, EL students represent three to four percent of the whole student population. EP students represent around 10% of the student population, and the rest are NE students. Also, the three data sets represent three high school cohorts. HSLS:09 represents the high school Class of 2013 nationally. ELS:2002 represents the high school Class of 2004, and NELS:88 represents the high school Class of 1992. In the following content, the high school Classes of 2013, 2004, and 1992 are used to refer to the findings for the three cohorts from the three data sets. More specifically, the data source of the results for the Class of 2013 is HSLS:09 Second Follow-up Restricted-use Data File (2016); the data source of the results for the Class of 2004 is ELS:2002 Second Follow-up Restricted-use Data File (2006); and the data source of the results for the Class of 1992 is NELS:88 Third Follow-up Restricted-use Data File (1994).

Table 2

Student Sample Sizes (Unweighted) and Proportions (Weighted) by Linguistic Status for the Three Data Sets

	HSLS:09 (High School Class of 2013)		ELS:2002 (High School Class of 2004)		NELS:88 (High School Class of 1992)	
	Unweighted Sample Size	Weighted Proportion (SD)	Unweighted Sample Size	Weighted Proportion (SD)	Unweighted Sample Size	Weighted Proportion (SD)
EL students	670	3.12% (0.0029)	650	3.63% (0.0020)	270	3.14% (0.0038)
EP students	3170	14.98% (0.0063)	2070	11.10% (0.0032)	1210	8.06% (0.0051)
NE	18060	81.90%	12080	85.27%	9690	88.80%

students		(0.0066)		(0.0037)		(0.0062)
Total	**21900**	**100%**	**14800**	**100%**	**11170**	**100%**

It is also notable that when the NCES conducted these three longitudinal nationally representative surveys, they excluded students who were considered to be ineligible to participate in the studies. One of these excluded groups was EL students who were believed to have relatively low levels of English proficiency and were unable to complete the surveys. Therefore, EL students who participated in this study were likely to have had higher levels of English proficiency and academic skills (and thus be more college-aspirant/bound) than the average EL student across the nation. In other words, this study may present more positive and optimistic findings about high school EL students' academic achievements than the national reality.

Variables

The study used variables from the three national data sets to represent outcomes at the five college access stages and the factors that impact the outcomes. For HSLS:09, the study used data from the base year data collection to the second follow-up data collection, which is three years after high school graduation of the cohort (i.e., the year of 2016). For ELS:2002, the study used the data from the base year data collection to the second follow-up data collection, which is two years after high school graduation of the cohort (i.e., the year of 2006). For NELS:88, the study used data from the base year data collection to the third follow-up data collection, which is two years after high school graduation of the cohort (i.e., the year of 1992).

Variables for the College Access Outcomes

Guided by the proposed integrated model, the study first focused on students' college access outcomes at the five stages. Following Toutkoushian and Paulsen's (2016) college choice model, the five stages are: college aspiration, college search, college application, college

admission, and college enrollment. This study selected variables from the three data sets that match the five stages, and these variables were coded as binary data (1 for "yes," and 0 for "no"). A detailed information table about the sources and information (e.g., ranges and/or categorical levels) of these variables is provided in Appendix A. These variables are also used as response variables in the inferential analysis.

First, at the stage of college aspirations, the variable denotes whether a student aspired to go to college. Second, at the stage of college search activities, the variable reports whether a student had college search activities. Third, the variable for the stage of college applications shows whether a student ever applied to college. For the fourth stage, college admissions, it is notable that none of the three data sets contain a variable that can precisely measure whether a student was admitted into any colleges they applied for prior to their college enrollment. However, two of the data sets contain variables that measure whether a student was admitted into the first college they applied to (HSLS:09) or whether a student was admitted into the college that they were most likely to attend (NELS:88). Therefore, these two variables were used to measure students' performance at this stage for the student participants from these two cohorts. However, it is also necessary to acknowledge that these two variables still cannot fully represent the college admission outcomes. Therefore, the interpretation of and the inferences from the statistical analysis in the next chapter should be contextualized at these measurement levels. Finally, at the fifth stage, college enrollment, this study primarily focused on two variables, whether a student enrolled in college, and whether a student enrolled in a four-year college; in addition, when providing descriptive statistics for the first research question, the study also reports two additional college enrollment outcomes as references: whether a student enrolled in a private for-profit college, and whether a student enrolled in a selective colleges.

These abovementioned college access outcomes are available for all stages for the three cohorts except for the following variables: (1) for the stage of college search, no comparable variable is available from the NELS:88 for the Class of 1992; (2) for the stage of college admission, no comparable variable is available from the ELS:2002 for the Class of 2004; and (3) for the enrollment in selective colleges, no comparable variable is available from the NELS:88 for the Class of 1992.

Variables for the College-going Contexts

The selection of the variables for students' college-going contexts is guided by the literature review and the theoretical framework used in the study. These variables reflect students' habitus and capital (as partly influenced by their individual and family backgrounds), school contexts, and state contexts. To accompany the descriptions of the variables in the following subsections, a detailed information table about the sources and information (e.g., ranges and categorical levels) of these variables is provided in Appendix A. These variables are also used as explanatory variables in the inferential analysis.

Habitus and Capital. Variables from the first level of students' college-going contexts focus on students' habitus and capital. As the proposed model suggests, students' habitus and capital are shaped by their individual and family backgrounds. At this level, the study first included students' racial and ethnic background, gender, as well as linguistic status.

For the variable of race and ethnicity, although the three original data sets have different categorization criteria, they mainly include the following categories: American Indian/Alaska Native students, Asian students, Black students, Latinx students, Multiracial students, Native Hawaiian/Pacific Islander students, and White students. However, due to the limited and unbalanced sample sizes of the study, some necessary adjustments were made to make sure that

the statistical models are robust with this variable: within the EL student group, the sample sizes of Black EL students, Multiracial EL students, American Indian/Alaska Native EL students, and Native Hawaiian/Pacific Islander EL students are very limited; therefore, leaving any category as one single group would cause complete or quasi-complete separation of these samples from the model, making the inferential analysis invalid. Some studies directly deleted categories with the small sample sizes from a target variable (e.g., see Kanno & Cromley, 2013, 2015) to make the model converge, while others regroup the categories with limited sample sizes into a new one within a target variable (e.g., see Callahan & Shifrer, 2016; Toutkoushian et al., 2018). This study adopted the second approach, and regrouped the categories of this variable for statistical modeling as: White students, Latinx students, and other racial minority students (this third category includes: American Indian/Alaska Native students, Asian students, Black students, Multiracial students, and Native Hawaiian/Pacific Islander students). The reasons for the abovementioned regrouping methods are: (1) many scholars in the field of TESOL/bilingual education having been specifically emphasizing the importance of studying college-going performance of Latinx EL students, who represent the largest EL student groups in the nation and whose average college enrollment outcomes are lower than average (e.g., see Núñez et al., 2016; Rios-Aguilar & Gándara, 2012); (2) the study seeks to retain sample sizes from all the categories no matter how small they are, thus grouping the small categorical levels can avoid complete or quasi-complete separation.

The next group of variables represents students' economic, cultural, and social capitals. These variables include: annual family income, parental educational levels, parental expectations on children's education, and numbers of friends who aspired to attend two-year or four-year colleges after high school graduation.

First, students' economic capital is reflected in the variable of family income. All three data sets used numerical scales to measure the annual family income of students, although the criteria and ranges differ across the three cohorts: the scale of HSLS:09 ranges from 1 ("less than $15,000") to 13 ("more than $235,000"); the scale of ELS:2002 ranges from 1 ("None") to 13 ("$200,001 or more"); and the scale of NELS:88 ranges from 1 ("None") to 15 ("$200,000 or more").

The second and third variables focus on students' parental educational levels and parental expectations on children's education. Both original variables from the three data sets used numeric scales to report parents' responses (e.g., from "Did not finish high school" to "Ph.D./M.D./other professional degrees"). This study retained the original information for the variable of parental expectations on children's education. To address the literature about the achievement gap between first-generation college students and non-first-generation college students, the study recoded the variable of parental educational levels to measure whether the parent with the highest educational levels of the student had college education or not ("below college education" versus "college education or above"). However, it is also important to point out that the original variables of parental educational levels in the three data sets provided different options for the survey respondents, making the measurement scales differ: ELS:2002 and NELS:88 provided respondents with both options of some college education without degree (e.g., "attended college, no degree,") and college graduation (e.g., "graduated from college"), so the level of "college education or above" included those who attended college but did not graduate; in comparison, HSLS:09 did not have an option of some college education without degree for the respondents, so the level "college education or above" for this cohort excluded those who attended college but did not graduate.

The last two variables at this group measured the number of students' friends who planned to attend two-year colleges or four-year colleges. The three data sets also used numerical scales to measure the proportion of a student's friends who planned to attend two-year colleges or four-year colleges, and the criteria and ranges differ across the three cohorts: HSLS:09 and ELS:2002 have six levels, ranging from 0 ("Don't know") to 5 ("All of them"); Not containing the option of "Don't know," NELS:88 has five levels, ranging from 1 ("None") to 5 ("All of them").

School Contexts. The second level of students' college-going environments features the school contexts. This study focuses on the three aspects of the school contexts: student individual academic achievements at schools, high school types and locations, and high school demographic and socioeconomic compositions.

First, this study included two variables to measure students' academic achievements at schools: high school cumulative GPA, and math course-taking pattern. All three data sets reported students' standardized high school cumulative GPAs, ranging from 0 to 4. For the math course-taking patterns, HSLS:09 and ELS:2002 reported students' highest levels of math courses with numeric scales, ranging from 0 ("No math") to 13 ("AP/IB Calculus") in HSLS:09 and from 0 to 8 ("Advanced III/Calculus") in ELS:2002. Different from these two data sets, NELS:88 reported students' total units of math courses taken at high schools, ranging from 0 to 10.

Second, the study included the types and locations of high schools where students attended. In terms of type, a high school is classified as either public or private; in terms of location, a high school is classified as either urban or non-urban. Notably, for the factor of school type, while it is examined in the descriptive analysis for the first research question, results show that the vast majority of the students (over 90%) attended public high schools, which is

especially the case for EL students (approximately 99%); therefore, this factor is not included in statistical modeling to avoid quasi-complete separation or failure of model convergence.

Third, this study also included the variables of school demographic and socioeconomic compositions. These variables include: school populations of racial minority students, students who received free/reduced-price lunch, and students who took AP courses. The past literature suggests that these factors reflect the demographic compositions, socioeconomic levels, and educational resources of high schools (e.g., see Engberg & Wolniak, 2010). Therefore, these variables were entered in the statistical models that investigate the relations between college access outcomes and college-going contexts. Additionally, the study also provides information about the school population of EL students to compare this set of descriptive statistics among the three student groups with different linguistic statuses. All these variables were measured based on the unit of percentage, ranging from 0 to 100.

State Contexts. The final aspect of the college-going contexts is at the state level. This study included two variables at the state levels: state geographic region and state immigration context. The variable of state geographic region classified the geographic location of a high school where students attended into four groups: Northeast, Midwest, South, and West. Identified by the name of the state where a student's high school is located, the variable of state immigration context consists of three categories: established immigrant destinations, new immigrant destinations, and other states that are not established or new immigrant destinations. All three data sets reported the variable of state geographic region. However, NELS:88 does not contain the information for the name of state where the student studied, so the variable of the state immigration context is not available for this data set.

Missing Data

The method of multiple imputation was adopted to handle the problem of missing data in the three data sets. Multiple imputation is based on the statistical assumption that data were missing completely at random (MCAR) or missing at random (MAR) (Little & Rubin, 2019; Rubin, 1976; van Buuren et al., 2006). Compared to the traditional methods that deal with missing data (e.g., listwise deletion, pairwise deletion, or imputation with means or medians), multiple imputation has more advantages for statistical analysis, such as allowing us to keep the full sample and diminish the biases in estimation (Schafer & Graham, 2002; Wolniak et al., 2016).

This study mainly used the *mice*, *miceadds*, and *mitools* packages, along with the *survey* package in R (Lumley, 2019, 2020; Robitzsch et al., 2021; van Buuren, 2021) to create multiple imputations, add analytic weights, and analyze and pool results from the multiply imputed data. For each data set (HSLS:09, ELS:2002, and NELS:88), I created 20 multiple imputations with five iterations (e.g., see principles from Bodner, 2008; Enders, 2010; Pan & Wei, 2018; White et al., 2011). The imputation models used all the variables specified in this section, including the response and explanatory variables (see van Ginkel et al., 2020; Graham, 2009). The analytic weights were added to the multiply imputed data to maintain original NCES survey designs for each data set. The analyses in this study, including descriptive and inferential statistics, used the multiply imputed data sets. After the statistical analysis, the results and inferences from the multiply imputed data sets were combined and pooled (Eekhout et al., 2012; Little & Rubin, 2019; Rubin, 1976).

Analytical Procedures

A series of analytical procedures were completed to answer the research questions in the study. First, I completed data cleansing and preparatory procedures for all three large-scale data

sets separately. These procedures include the identification of EL, EP, and NE students in each data set, unification of the variable categories and their numeric labels in the three data sets, implementation of multiple imputation, and adding appropriate analytic weights.

To answer the first research question, I conducted the exploratory data analysis about EL students' backgrounds and their college access outcomes in comparison to those of EP students and NE students. First, the exploratory data analysis included descriptive statistics of students' academic performances and outcomes in the five college access stages. Second, I also summarized information about EL students' and their non-EL peers' socio-cultural and academic backgrounds at the individual and family, school, and state levels. A summary of descriptive statistics was provided in the chapter of Findings, with comprehensive tables provided in Appendix B.

Next, to answer the second research question about the diachronic trends of EL students' college access, I compared the differences between EL students' and non-EL students' college-going outcomes from the three cohorts. NE students, the majority of the student groups (over 80% of the whole student body in each cohort), were treated as the reference group for EL students (as well as EP students) to denote the differences. To achieve the comparative results, I used GLMs with the logit link and built nested models of four levels.

More specifically, the form of the models is expressed as

$$\log\left(\frac{\mu_i}{1-\mu_i}\right) = \beta_0 + \beta_1 X_{1i} + \cdots + \beta_p X_{pi} + \gamma L_i, \qquad i = 1, 2, \ldots, n \tag{12}$$

where $\log\left(\frac{\mu_i}{1-\mu_i}\right)$ is the log odds[3] (or logit) of the positive college-going outcomes of the ith student (e.g., having college aspirations or enrollment in college); X_1, X_2,…, X_p are the non-

[3] In statistics, odds are the ratio of the probability that an event occur to the probability that this event does not occur. Odds ratio is the ratio of two different odds.

linguistic variables that are believed to influence the college-going outcomes (e.g., race and ethnicity, family income, parental educational levels), and β_0, β_1, β_2,…, β_p are the intercept or coefficients to be estimated; and L denotes the indicator of the linguistic status (i.e., L = 1, 2, and 3 for NE, EL, and EP students), and γ denotes the estimated coefficients of L after controlling the factors of X_1, X_2,…, X_p.

Based on the approach of nested models, the first-level models only include the factor of linguistic status as the explanatory variable. At the second level, the models control the factors of individual habitus and capital in addition to the explanatory factor of linguistic status. The third-level models include the factors of school contexts as control variables in addition to the abovementioned factors. Finally, the four-level, or full models include both the factor of linguistic status as well as those from individual habitus and capital, school contexts, and state contexts. Findings from the models for the three cohorts were examined to compare the differences in the coefficients of the linguistic statuses after controlling different blocks of factors. The results can also help us understand the trends of EL students' college access and enrollment rates compared to their non-EL peers diachronically.

Finally, I used GLMs with the logit link to examine how different factors impact EL students' college access at five stages at each period. These results answered the third research question. For each student group (EL, EP, or NE students), I built models for the five college access stages for each cohort. The models for each student group present information about variations in the key factors' impact on EL students' and non-EL students' college access outcomes. Factors with statistical significance were reported to examine how they affected EL students' and non-EL students' college access outcomes. Similarly, for each student group from each cohort, the form of the models is expressed as

$$\log\left(\frac{\mu_i}{1-\mu_i}\right) = \beta_0 + \beta_1 X_{1i} + \cdots + \beta_p X_{pi}, \qquad i = 1, 2, \ldots, n \tag{13}$$

where $\log\left(\frac{\mu_i}{1-\mu_i}\right)$ is the log odds (or logit) of the positive college-going outcomes of the ith student; X_1, X_2,…, X_p are the variables that are believed to influence the college-going outcomes, and β_0, β_1, β_2,…, β_p are the intercept or coefficients to be estimated.

In this study, some of the explanatory variables are continuous data. These variables include: high school cumulative GPA, total math units taken by students, percentage of racial minority (or White) students at the high school that a student attended, percentage of students who received free or reduced-price lunch at the high school that a student attended, and percentage of students who took AP courses at the high school that a student attended. The rest of the explanatory variables chosen from the three data sets are discrete data (categorical or binary). However, some of these variables use numerical scales to denote the responses that are ordinal in nature. In inferential statistical analysis, explanatory variables with ordinal levels can be treated as continuous data, especially for conditions where the sample size is limited (Kutner et al., 2015; Sprent & Smeeton, 2016). These explanatory variables include: family income, parents' expectations for children's education, the highest level of the math course a student took, number of friends who planned to attend two-year colleges, and number of friends who planned to attend four-year colleges.

For the explanatory variables that are not treated as continuous data, a reference category is chosen for each variable in the statistical modeling so that different levels are comparable. These reference categories are:

1. Race and ethnicity: White students;

2. Gender: Male students;
3. Parents' highest educational levels: Below college education;
4. School location: City/urban;
5. State geographic region: Northeast;

   State immigration context: Established immigrant destination (EID).

CHAPTER 5

FINDINGS

This chapter presents findings in three main areas corresponding to the three research questions proposed by the dissertation study: (1) varying college-going outcomes and learning environments among students with different linguistic statuses; (2) diachronic changes in EL students' college experience outcomes in the past three decades; and (3) associations between EL students' learning contexts and their college experience outcomes.

Findings for Research Question One:

College-Going Outcomes and Environments among EL, EP, and NE Students

This section addresses the first research question regarding varying college-going outcomes and environments among EL, EP, and NE students. I used the method of balanced repeated replicates for the variance estimation. Table 3 presents the key findings of the weighted means or percentages of EL, EP, and NE students' college-going activities and contexts. These findings are categorized into four groups: college access outcomes, student habitus and capital, school contexts, and state contexts. More comprehensive, detailed information for the findings (e.g., data sources, means and percentages, and standard deviations) are presented in tables in Appendix B.

Table 3

Weighted Means/Percentages of EL, EP, and NE Students: College-going Activities and Contexts

Variable	Categorical Level	Class of 2013			Class of 2004			Class of 1992		
		EL	EP	NE	EL	EP	NE	EL	EP	NE
College access stages										
Students without specified college aspirations*		0.437	0.267	0.253	0.279	0.199	0.149	0.375	0.255	0.197
Students without college search activities		0.297	0.179	0.175	0.361	0.258	0.228			NA
Students without college applications**		0.209	0.118	0.142	0.337	0.243	0.214	0.653	0.421	0.379
Students admitted to college (first applied/most likely)		0.264	0.350	0.376			NA	0.165	0.324	0.367
Students without college enrollments		0.384	0.270	0.266	0.436	0.320	0.276	0.649	0.288	0.274
Students enrolled in four-year colleges		0.206	0.378	0.470	0.218	0.311	0.434	0.133	0.344	0.417
Students enrolled in private for-profit colleges		0.132	0.044	0.033	0.038	0.048	0.040	0.039	0.046	0.034
Students enrolled in selective colleges		0.107	0.279	0.333	0.172	0.216	0.348			NA
Habitus and capital										
Race & ethnicity	White	0.148	0.090	0.615	0.220	0.126	0.686	0.137	0.198	0.767
	Latinx	0.639	0.697	0.113	0.543	0.575	0.087	0.544	0.565	0.054
	Non-Latinx minority	0.214	0.213	0.272	0.238	0.299	0.227	0.318	0.237	0.179
Gender	Male	0.495	0.468	0.510	0.494	0.499	0.494	0.542	0.509	0.501
	Female	0.505	0.532	0.490	0.506	0.501	0.506	0.458	0.491	0.499
Family Income*		2.799	3.431	4.445	7.463	8.059	9.195	7.808	9.021	10.346
Parental education: Below college*		0.688	0.650	0.428	0.494	0.439	0.246	0.575	0.516	0.270
Parental expectation on children's education*		6.040	6.948	7.064	5.223	5.469	5.304	7.441	7.985	7.853
Friends with 2-year college plans*	Don't know	0.192	0.221	0.224	0.006	0.005	0.004			/
	None	0.090	0.119	0.159	0.175	0.146	0.151	0.094	0.207	0.184
	Less than half/A few	0.291	0.255	0.285	0.292	0.285	0.317	0.335	0.297	0.306
	About half/Some	0.250	0.201	0.189	0.323	0.342	0.361	0.324	0.306	0.348
	More than half/Most	0.126	0.152	0.107	0.172	0.193	0.149	0.204	0.162	0.141
	All	0.052	0.051	0.037	0.032	0.028	0.018	0.042	0.028	0.021
Friends with 4-year college plans*	Don't know	0.218	0.150	0.161	0.003	0.007	0.004			/
	None	0.025	0.034	0.034	0.103	0.112	0.072	0.127	0.089	0.065

	Less than half/A few	0.199	0.135	0.133	0.279	0.227	0.163	0.343	0.228	0.173
	About half/Some	0.171	0.198	0.187	0.265	0.246	0.241	0.343	0.228	0.173
	More than half/Most	0.277	0.327	0.327	0.263	0.324	0.427	0.252	0.353	0.43
	All	0.110	0.156	0.158	0.095	0.085	0.092	0.039	0.136	0.121
School contexts										
GPA		2.378	2.646	2.721	2.368	2.501	2.713	2.378	2.552	2.643
Highest math-level*		7.176	8.363	8.103	4.660	5.193	5.384			/
Total math Unit				/			/	2.443	3.009	3.108
School type	Public	0.997	0.957	0.923	0.985	0.951	0.915	0.984	0.919	0.894
	Private	0.003	0.043	0.077	0.015	0.049	0.085	0.016	0.081	0.106
School location	Urban	0.560	0.463	0.282	0.424	0.424	0.270	0.254	0.447	0.275
	Non-urban	0.440	0.537	0.718	0.576	0.576	0.730	0.746	0.553	0.725
School population: Racial minority students		0.607	0.621	0.354	0.557	0.578	0.302	0.569	0.543	0.223
School population: Free/reduced-price lunch		0.550	0.494	0.369	0.335	0.365	0.237	0.398	0.327	0.186
School population: AP students		0.173	0.185	0.156	0.146	0.148	0.145	0.070	0.084	0.084
School population: EL students		0.153	0.122	0.051	0.126	0.118	0.036	0.083	0.082	0.029
State contexts										
State geographic region	Northeast	0.122	0.170	0.175	0.127	0.123	0.180	0.118	0.151	0.206
	Midwest	0.107	0.109	0.249	0.154	0.154	0.262	0.079	0.114	0.266
	South	0.337	0.313	0.389	0.259	0.272	0.358	0.269	0.297	0.364
	West	0.435	0.408	0.187	0.461	0.451	0.200	0.533	0.438	0.164
State immigration contexts	EID	0.529	0.674	0.365	0.605	0.642	0.340			
	NID	0.106	0.066	0.228	0.079	0.084	0.220			
	Other	0.365	0.260	0.407	0.315	0.273	0.440			NA

Notes:
*: For these variables, the measurement scales differ across the three cohorts. Please refer to Appendix A for the detailed information.
**: For the Class of 1992, the information about whether a student applied for college was collected during their 12th grade (1992); however, the information about whether a student enrolled in college was collected two years after their expected high school graduation (1994). Therefore, the percentage of students who did not apply for college could be smaller than those who did not enroll in college (i.e., a student might not apply for college in their 12th grade but might apply for and be admitted into college after high school graduation and thus still enrolled in college).

College Access Outcomes

The first category compares the college access outcomes among students with different linguistic statuses. Table 3 shows that for all five college access stages, the percentage of EL students who had no college-going activities has been consistently much higher than the other two student groups in the past three decades. For example, for the college application stage, more than half of the EL students (65.3%) from the high school Class of 1992 did not apply to college; for the high school Class of 2013, the percentage of EL students who did not apply to college (20.9%) was almost twice as high as those of EP students (11.8%) and also much higher than NE students (14.2%).

At the final stage (college enrollment), the percentage of EL students who did not go to college remained the highest among the three student groups across the three decades. Nevertheless, this percentage decreased the most (from 64.9% in 1992 to 38.4% in 2013) among the three student groups. However, a closer investigation into the types of college that EL students enrolled in partly explained why the percentage of EL students who attended college increased remarkably. First, while the proportions of EL students who attended four-year colleges increased from the high school Class of 1992 to the Class of 2013, the percentage was still lower than those of EP and NE students. Second, the percentage of EL students who attended private for-profit postsecondary institutions (13.2%) was much higher than those of EP students (4.4%) and NE students (3.3%) in the most recent cohort. Furthermore, the table demonstrates that compared to EP and NE students, only a very small proportion of EL students attended selective four-year colleges, and the proportion decreased from 2004 (17.2%) to 2013 (10.7%). These results suggest that the percentage of EL students who attended non-selective and private for-profit postsecondary institutions increased over the past three decades, which

were consistently the highest among the three student groups. The majority of them also did not start in four-year colleges.

Compared to EL students, EP students' college access outcomes were closer to, although mostly lower than, those of NE students. NE students outperformed EL and EP students in all five stages across the three decades except for the most recent cohort, where EP students had similar performances as those of NE students at the stages of college search activities, college applications, and college enrollment rates.

Habitus and Capital

The second aspect of findings compares students' habitus and capital, which are reflected in their individual and family backgrounds. Table 3 shows that around 80% of the EL students from the three cohorts were racial and ethnic minority students, with the percentage remaining mostly consistent across the three cohorts. The percentage of the EP students who were from racial and ethnic minorities increased over the past three decades. The majority of both EL and EP minority students were Latinx students. The percentage of the NE students who were from racial and ethnic minorities was lower than the EL and EP student groups, but the percentage also increased remarkably from 23.3% to 38.5% from the Class of 1992 to the Class of 2013. Student gender remained mostly balanced for all three student groups over the past three decades.

The next set of statistics compared economic and symbolic capitals held by the three student groups. First, EL students' average family incomes were consistently the lowest, NE students' average family incomes remained the highest, and those of EP students were in the middle. Second, the percentages of EL and EP students whose parents did not have college education were much higher than those of NE students; notably, they were twice the percentage

of NE students from the Classes of 1992 and 2004. The percentage of EL students whose parents did not have college education was even higher than that of EP students. Similarly, for the numeric scales that measure parental expectations on children's education, the mean of EL students was the lowest and the mean of NE students was the highest during the past three decades.

The next two variables reflect students' social capital in educational settings: their numbers of friends who planned to attend two-year or four-year colleges. The summary statistics in Table 3 shows that the numbers of students' friends who planned to attend two-year colleges were similar across the three student groups for the three cohorts; EL students, however, still tended to have more friend who had two-year college-going plans. In contrast, EL students had fewer friends who planned to attend four-year colleges than the other two student groups. NE students had more friends who planned to attend four-year colleges than the other two groups.

School Contexts

The third aspect of findings focuses on the differences in the school contexts among the three student groups. First, the summary statistics report students' academic achievements at high schools: high school cumulative GPAs and math course-taking patterns. On average, EL students had the lowest average high school cumulative GPAs among the three student groups across the three classes from the 1990s to the 2010s. In comparison, NE students had the highest average high school cumulative GPAs for all three cohorts. Similar to the high school cumulative GPA, EL students were disadvantaged at high school math achievement compared to their non-EL peers: for the Class of 1992, the average units of the math courses they took were the lowest; for the Classes of 2004 and 2013, the average highest levels of math courses they took were the lowest among the three student groups as well. EP students' average units of math courses (Class

of 1992) and average highest levels of math courses (Class of 2004) were higher than EL students but lower than NE students. However, for the Class of 2013, the average highest levels of the math courses EP students took surpassed those of NE students and became the highest among the three student groups.

The next summary statistics report the school types and locations of the three student groups. First, compared to their non-EL peers, few EL students attended private high schools: the percentages were 0.3%, 1.5%, and 1.6%, respectively, for the three cohorts. In comparison, the percentage of NE students who attended private high schools was consistently the highest among the three student groups. Overall, though, the vast majority (90% or more) of students from all three groups attended public schools. In terms of school location, the percentage of EL students who attended urban schools increased significantly from the 1990s to the 2010s. The percentage of EL students from the Class of 1992 who attended urban schools was the lowest among the three student groups. However, it became the highest for the Classes of 2004 and 2013; especially for the Class of 2013, more than half of the EL students (56.0%) attended schools in the urban areas. Compared to EL and EP students, the percentage of NE students who attended urban schools was always the lowest except for the Class of 1992.

The summary statistics also included the student populations of the schools that the three student groups attended. First, for all three cohorts, EL and EP students attended schools with much higher percentages of racial minority students (all over 54%) than those of the schools where NE students attended (below 36%). Similarly, for all three cohorts, EL and EP students attended schools with much higher percentages of students who received free or reduced-price lunch than those of NE students; the percentages of EL students at schools where EL and EP students attended were also much higher than those of NE students. Compared to these statistics,

the gaps in the school populations of students who took AP courses are smaller among the three student groups: for the Classes of 2013 and 2004, the schools that EL and EP students attended had relatively higher average percentages of students who took AP courses than those of NE students; for the Class of 1992, the schools that EL students attended had relatively lower average percentages of students who took AP courses than those of EP and NE students.

State Contexts

The final aspect of the college-going contexts focuses on the state level. For the geographic regions of the high schools that students attended, the majority of EL and EP students studied in the South and West; for NE students, the majority studied in the Midwest and the South. In terms of state immigration contexts, the majority of EL and EP students studied in the states that are established immigrant destinations (EIDs), and the percentages of EL and EP students who studied in the states that are new immigrant destinations (NIDs) were the lowest. Compared to EL and EP students, the percentages of NE students who studied in the three types of states were relatively more even, with the percentages in the NIDs slightly lower than those of the other two types.

Findings for Research Question Two:

Diachronic Changes in EL Students' College-Going Outcomes

This section mainly answers the question about the diachronic changes in EL students' college-going outcomes in the past three decades (with the comparison between EL students' and non-EL students' college-going results). The descriptive statistics that answer the first research question show that the majority of the college access outcomes of both EL students and non-EL students were improved over the past three decades. However, the gaps between EL students' college-going outcomes and those of non-EL students have remained wide. Therefore,

comparing the statistics within the EL students of different cohorts may not fully showcase the diachronic changes in their college access outcomes at different stages. Instead, a comparison of the differences between EL and non-EL students' college access outcomes at the five stages can provide more information.

To compare the college access outcomes between EL and non-EL students, this study uses the GLMs with the logit link to analyze the statistical differences at each stage for each cohort. To make the comparison possible, the study adopts the approach of nested models. In these nested models, college access outcomes at different stages are the response variables. In terms of the explanatory variables, the study built four levels of models: the first-level models only include the variable of linguistic status that indicates whether a student is an EL, EP, or NE student, and no additional factors are controlled; at the next level, the models include the variable of linguistic status as well as those that represent student habitus and capital as control variables; third, the models include the control variables of the school contexts in addition to the variables of linguistic status and student habitus and capital; finally, the models include the control variables of the state contexts in addition to the variables of linguistic status, student habitus and capital, and school contexts.

Since the NE students represent the majority of the students (more than 80% of the whole student body) for all three cohorts at the national level, this group is used as the reference category. For each set of the nested models, the coefficients and their statistical significance of the linguistic status as an EL student are primarily compared to those of an NE student to see how they were changed over the past three decades. The data source of the results for the Class of 2013 is HSLS:09 Second Follow-up Restricted-use Data File (2016); the data source of the results for the Class of 2004 is ELS:2002 Second Follow-up Restricted-use Data File (2006); and

the data source of the results for the Class of 1992 is NELS:88 Third Follow-up Restricted-use Data File (1994).

Nested Models (Level One): Linguistic Status as the Explanatory Variable Only

The first set of nested models treats student linguistic status as the explanatory variable, and no control variables are included. Therefore, this set of models does not consider the contextualized individual backgrounds or college-going environments of the three student groups. Results from these models provide findings of how EL students' performance changed broadly as a group. Findings from the estimated models are provided in Tables 4 to 6, which represent outcomes at the five college access stages from the Classes of 2013, 2004, and 1992.

Table 4

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2013 (Level One)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.833 ***	-0.686 **	-1.139 ***	-0.522 *	-0.545 **	-1.139 ***
	(0.196)	(0.225)	(0.201)	(0.224)	(0.195)	(0.201)
EP	-0.072	-0.024	-0.285 **	-0.111	-0.023	-0.285 **
	(0.114)	(0.130)	(0.103)	(0.109)	(0.109)	(0.103)
Intercept	1.085 ***	1.549 ***	-0.212 ***	-0.506 ***	1.017 ***	-0.212 ***
	(0.038)	(0.043)	(0.030)	(0.031)	(0.035)	(0.030)
N	21900	21900	21900	21900	21900	21900

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 5

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2004 (Level One)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
EL	-0.795 ***	-0.645 ***	-0.628 ***	-0.709 ***	-1.010 ***
	(0.134)	(0.138)	(0.123)	(0.116)	(0.146)
EP	-0.355 ***	-0.162 +	-0.164 *	-0.214 **	-0.531 ***
	(0.092)	(0.083)	(0.080)	(0.073)	(0.066)
Intercept	1.747 ***	1.217 ***	1.303 ***	0.967 ***	-0.266 ***
	(0.034)	(0.032)	(0.029)	(0.026)	(0.023)
N	14800	14800	14800	14800	14800

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 6

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 1992 (Level One)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.892 **	-1.133 ***	-1.082 ***	-1.589 ***	-1.544 ***
	(0.279)	(0.299)	(0.299)	(0.216)	(0.238)
EP	-0.330 +	-0.176	-0.187	-0.068	-0.311 *
	(0.200)	(0.160)	(0.132)	(0.180)	(0.133)
Intercept	1.405 ***	0.495 ***	-0.547 ***	0.973 ***	-0.335 ***
	(0.041)	(0.039)	(0.039)	(0.039)	(0.038)
N	11170	11170	11170	11170	11170

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

The tables show that all the coefficients for the category of EL students were statistically significant for all outcomes at the significance level $\alpha = 0.05$ except for the stage of college application from the Class of 2013, which was statistically significant at the level $\alpha = 0.1$. This demonstrates that the differences between EL students' and NE students' college access outcomes were statistically significant overall. Also, all the coefficients for the category of EL students were negative, which means that the odds of EL students achieving positive college access outcomes were smaller than those of NE students. In comparison, all the coefficients for the category of EP students were also negative when using the group of NE students as the baseline; nevertheless, the negative associations were statistically significant at the level $\alpha = 0.05$ only for some stages from the Class of 2004. The results show that EL students lagged behind both EP and NE students in terms of college access outcomes over the past three decades.

These estimated models show that overall, treating their NE peers as a reference and comparing the coefficients (i.e., the logarithm of odds ratios) across the three cohorts, EL students have been more likely to have college access activities from the 1990s to the 2010s. More specifically, for the first two college access stages, provided that the data are available, the odds of EL students having college-going activities increased from the 1990s to the 2000s, but remained similar or decreased slightly from the 2000s to the 2010s. For example, Table 4 shows that for the students from the high school Class of 1992, the odds of EL students having college aspirations were 40.98% of the odds of NE students having college aspirations ($e^{-0.892} = 0.4098$). For the students from the high school Class of 2004, the odds of EL students having college aspirations were 45.16% of the odds of NE students having college aspirations ($e^{-0.795} = 0.4516$). For the students from the high school Class of 2013, the odds of EL students

having college aspirations were 43.47% of the odds of NE students having college aspirations ($e^{-0.833} = 0.4347$).

For the stages of college application, college admission, and overall college enrollment, EL students made consistent progress in college enrollment from the 1990s to the 2010s. For example, at the stage of college enrollment, the odds ratio between EL and NE students who enrolled in college increased from 20.41% ($e^{-1.589}$) in the 1990s to 57.98% ($e^{-0.545}$) in the 2010s. In terms of the four-year college enrollment, EL students were more likely to enroll in four-year colleges in the 2000s than 1990s; however, the odds ratio between EL and NE students decreased from the 2000s to the 2010s.

Nested Models (Level Two): Controlling Habitus and Capital

The second set of nested models treats student linguistic status as the explanatory variable, and includes student habitus and capital as control variables. Therefore, this set of models takes the contextualized individual and family backgrounds of the three student groups into consideration. Findings from the estimated models are provided in Tables 7 to 9, which represent outcomes at the five college access stages from the Classes of 2013, 2004, and 1992.

Table 7

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2013 (Level Two)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.395 +	-0.291	-0.431 +	-0.124	-0.139	-0.431 +
	(0.226)	(0.236)	(0.221)	(0.239)	(0.230)	(0.221)
EP	0.232	0.246	0.249 +	0.092	0.144	0.249 +
	(0.149)	(0.164)	(0.133)	(0.131)	(0.147)	(0.133)
Latinx	-0.314 *	-0.280 +	-0.504 ***	-0.165	0.114	-0.504 ***
	(0.131)	(0.148)	(0.109)	(0.117)	(0.132)	(0.109)
Other Racial Minority	-0.170 +	0.164	-0.257 **	-0.228 **	-0.180 *	-0.257 **
	(0.097)	(0.109)	(0.081)	(0.079)	(0.088)	(0.081)
Female	0.428 ***	0.822 ***	0.272 ***	0.373 ***	0.437 ***	0.272 ***
	(0.078)	(0.086)	(0.067)	(0.066)	(0.076)	(0.067)
Family Income	0.069 ***	0.049 **	0.116 ***	0.073 ***	0.116 ***	0.116 ***
	(0.016)	(0.018)	(0.012)	(0.012)	(0.017)	(0.012)
Parental Education: College or Above	0.406 ***	0.320 ***	0.637 ***	0.131 +	0.688 ***	0.637 ***
	(0.086)	(0.090)	(0.071)	(0.074)	(0.077)	(0.071)
Parental Expectation on Children's Education	0.073 ***	0.056 ***	0.120 ***	0.074 ***	0.086 ***	0.120 ***
	(0.010)	(0.011)	(0.009)	(0.009)	(0.010)	(0.009)
Number of Friends: 2-Year College Plan	-0.077 **	-0.061 +	-0.365 ***	-0.158 ***	-0.198 ***	-0.365 ***
	(0.029)	(0.032)	(0.025)	(0.024)	(0.030)	(0.025)
Number of Friends: 4-Year College Plan	0.402 ***	0.313 ***	0.411 ***	0.243 ***	0.342 ***	0.411 ***
	(0.025)	(0.029)	(0.023)	(0.023)	(0.026)	(0.023)
Intercept	-0.923 ***	-0.250 *	-2.524 ***	-2.009 ***	-1.066 ***	-2.524 ***
	(0.122)	(0.125)	(0.112)	(0.116)	(0.124)	(0.112)
N	21900	21900	21900	21900	21900	21900

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 8

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2004 (Level Two)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
EL	-0.315 +	-0.373 *	-0.101	-0.076	-0.390 *
	(0.161)	(0.159)	(0.146)	(0.144)	(0.178)
EP	0.070	0.050	0.294 **	0.374 ***	0.060
	(0.115)	(0.106)	(0.106)	(0.099)	(0.096)
Latinx	-0.403 ***	-0.136	-0.218 *	-0.422 ***	-0.627 ***
	(0.109)	(0.097)	(0.096)	(0.091)	(0.095)
Other Racial Minority	-0.272 **	0.188 *	-0.015	-0.332 ***	-0.157 *
	(0.086)	(0.079)	(0.076)	(0.069)	(0.067)
Female	0.333 ***	0.695 ***	0.458 ***	0.407 ***	0.152 **
	(0.068)	(0.057)	(0.059)	(0.055)	(0.052)
Family Income	0.085 ***	0.055 ***	0.117 ***	0.143 ***	0.169 ***
	(0.015)	(0.014)	(0.013)	(0.013)	(0.014)
Parental Education: College or Above	0.220 **	0.206 **	0.529 ***	0.529 ***	0.492 ***
	(0.077)	(0.069)	(0.065)	(0.061)	(0.066)
Parental Expectation on Children's Education	0.293 ***	0.327 ***	0.273 ***	0.304 ***	0.368 ***
	(0.026)	(0.024)	(0.022)	(0.022)	(0.023)
Number of Friends: 2-Year College Plan	0.051	-0.008	-0.091 **	-0.148 ***	-0.506 ***
	(0.036)	(0.031)	(0.034)	(0.031)	(0.030)
Number of Friends: 4-Year College Plan	0.542 ***	0.373 ***	0.531 ***	0.578 ***	0.788 ***
	(0.032)	(0.029)	(0.029)	(0.028)	(0.030)
Intercept	-2.455 ***	-2.604 ***	-3.089 ***	-3.742 ***	-5.559 ***
	(0.211)	(0.181)	(0.191)	(0.189)	(0.212)
N	14800	14800	14800	14800	14800

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 9

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 1992 (Level Two)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.652 +	-0.271	-0.210	-0.787 **	-0.652 +
	(0.361)	(0.378)	(0.329)	(0.305)	(0.361)
EP	0.130	0.314	0.327 *	0.562 *	0.130
	(0.193)	(0.207)	(0.151)	(0.219)	(0.193)
Latinx	-0.391 *	-0.494 **	-0.660 ***	-0.364 *	-0.391 *
	(0.184)	(0.161)	(0.145)	(0.169)	(0.184)
Other Racial Minority	-0.056	-0.237 +	-0.664 ***	-0.344 **	-0.056
	(0.123)	(0.123)	(0.108)	(0.120)	(0.123)
Female	0.227 *	0.464 ***	0.362 ***	0.389 ***	0.227 *
	(0.088)	(0.083)	(0.086)	(0.087)	(0.088)
Family Income	0.133 ***	0.090 ***	0.058 **	0.142 ***	0.133 ***
	(0.021)	(0.019)	(0.020)	(0.021)	(0.021)
Parental Education: College or Above	0.511 ***	0.226 *	0.147	0.655 ***	0.511 ***
	(0.109)	(0.104)	(0.110)	(0.105)	(0.109)
Parental Expectation on Children's Education	0.499 ***	0.211 ***	0.192 ***	0.325 ***	0.499 ***
	(0.041)	(0.025)	(0.026)	(0.023)	(0.041)
Number of Friends: 2-Year College Plan	-0.622 ***	-0.236 ***	-0.114 **	-0.110 *	-0.622 ***
	(0.043)	(0.044)	(0.040)	(0.044)	(0.043)
Number of Friends: 4-Year College Plan	0.684 ***	0.556 ***	0.348 ***	0.481 ***	0.684 ***
	(0.048)	(0.043)	(0.041)	(0.042)	(0.048)
Intercept	-7.094 ***	-3.599 ***	-3.767 ***	-4.713 ***	-7.094 ***
	(0.429)	(0.322)	(0.287)	(0.287)	(0.429)
N	11170	11170	11170	11170	11170

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

The tables show that after controlling the factors of student habitus and capital, all the coefficients for the category of EL students were still negative, demonstrating the smaller odds of EL students achieving positive college access outcomes compared to NE students. In comparison, the majority of the coefficients for the category of EP students were now positive after controlling student habitus and capital factors, indicating higher odds of EP students' positive college-going outcomes than those of NE students. For the measurement of statistical significance, only three coefficients for the category of EL students were statistically significant at the significance level of $\alpha = 0.05$: college enrollment from the Class of 1992, and college search and four-year college enrollment from the Class of 2004. At the significance level of $\alpha = 0.1$, there are four more outcomes that were statistically significant: four-year college enrollment from the Class of 1992, college aspiration from the Class of 2004, and college aspiration and four-year college enrollment from the Class of 2013. For the rest of the college access outcomes, the differences between EL and NE students were not statistically significant.

In addition to the linguistic status, the associations between all the factors of student habitus and capital and their college access outcomes were statistically significant across the three decades. Furthermore, the odds ratio between EL and NE students with positive college-going activities also increased. These results demonstrate that the linguistic status was not the only factor that differentiates EL and non-EL student's college-going outcomes. This impact was associated with other factors such as their habitus and capital.

After controlling the factors of student habitus and capital, the results show that overall, EL students were more likely to have positive college-going outcomes from the 1990s to the 2010s, especially at the stages of college search and college enrollment (including four-year college enrollment). Notably, none of the coefficients for the outcomes from the Class of 2013

were statistically significant at the significance level of $\alpha = 0.05$, indicating that the differences between EL students' and NE students' college access outcomes were not statistically different at this level when student habitus and capital were included.

Nested Models (Level Three): Controlling Habitus and Capital and School Contexts

The third set of nested models also uses student linguistic status as the explanatory variable, but includes the variables of school contexts in addition to those of student habitus and capital. Therefore, this set of models considers the contextualized individual, family, and school backgrounds of the three student groups. Findings from the estimated models are provided in Tables 10 to 12, which represent outcomes at the five college access stages from the Classes of 2013, 2004, and 1992.

Table 10

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2013 (Level Three)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.436 +	-0.293	-0.481 +	-0.139	-0.224	-0.481 +
	(0.243)	(0.235)	(0.264)	(0.253)	(0.242)	(0.264)
EP	-0.009	0.093	-0.067	-0.103	-0.223	-0.067
	(0.156)	(0.167)	(0.149)	(0.139)	(0.162)	(0.149)
Latinx	-0.160	-0.051	-0.004	0.107	0.419 **	-0.004
	(0.137)	(0.150)	(0.126)	(0.124)	(0.148)	(0.126)
Other Racial Minority	-0.012	0.386 ***	0.297 **	0.020	0.074	0.297 **
	(0.100)	(0.110)	(0.095)	(0.080)	(0.099)	(0.095)
Female	0.268 **	0.733 ***	-0.005	0.231 **	0.203 *	-0.005
	(0.084)	(0.089)	(0.078)	(0.072)	(0.085)	(0.078)
Family Income	0.015	0.004	0.046 **	0.040 **	0.029	0.046 **
	(0.017)	(0.018)	(0.014)	(0.013)	(0.019)	(0.014)
Parental Education: College or Above	0.257 **	0.184 *	0.424 ***	-0.040	0.516 ***	0.424 ***
	(0.091)	(0.092)	(0.079)	(0.081)	(0.085)	(0.079)
Parental Expectation on Children's Education	0.041 ***	0.033 **	0.073 ***	0.042 ***	0.043 ***	0.073 ***
	(0.011)	(0.012)	(0.010)	(0.010)	(0.011)	(0.010)
Number of Friends: 2-Year College Plan	0.012	0.004	-0.254 ***	-0.077 **	-0.087 **	-0.254 ***
	(0.031)	(0.033)	(0.028)	(0.025)	(0.032)	(0.028)
Number of Friends: 4-Year College Plan	0.303 ***	0.226 ***	0.271 ***	0.147 ***	0.191 ***	0.271 ***
	(0.027)	(0.031)	(0.026)	(0.024)	(0.028)	(0.026)
High School GPA	0.637 ***	0.314 ***	1.416 ***	0.717 ***	1.097 ***	1.416 ***
	(0.063)	(0.068)	(0.072)	(0.062)	(0.071)	(0.072)
Math Course: Highest Level	0.114 ***	0.110 ***	0.191 ***	0.091 ***	0.155 ***	0.191 ***
	(0.017)	(0.018)	(0.015)	(0.015)	(0.018)	(0.015)
School Location: Non-Urban	0.133	0.138	-0.008	-0.150 +	-0.149	-0.008
	(0.099)	(0.106)	(0.091)	(0.087)	(0.106)	(0.091)
School Population: White Students	-0.006 **	0.000	-0.002	0.000	-0.010 ***	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)

School Population: Free/Reduced-Price Lunch	-0.006 *	-0.004	-0.007 **	-0.001	-0.016 ***	-0.007 **
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
School Population: AP Students	-0.001	0.007 +	0.002	-0.001	-0.004	0.002
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)
Intercept	-2.279 ***	-1.464 ***	-6.863 ***	-4.031 ***	-2.647 ***	-6.863 ***
	(0.314)	(0.302)	(0.304)	(0.292)	(0.332)	(0.304)
N	21900	21900	21900	21900	21900	21900

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 11

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2004 (Level Three)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
EL	-0.265	-0.348 *	-0.028	-0.006	-0.392 +
	(0.162)	(0.160)	(0.154)	(0.148)	(0.204)
EP	0.014	-0.006	0.249 *	0.316 **	-0.259 *
	(0.120)	(0.106)	(0.112)	(0.106)	(0.115)
Latinx	-0.105	-0.025	0.131	-0.026	-0.057
	(0.124)	(0.110)	(0.113)	(0.110)	(0.114)
Other Racial Minority	0.039	0.309 ***	0.402 ***	0.103	0.443 ***
	(0.105)	(0.089)	(0.093)	(0.089)	(0.088)
Female	0.182 *	0.628 ***	0.264 ***	0.192 **	-0.078
	(0.071)	(0.059)	(0.063)	(0.061)	(0.060)
Family Income	0.046 **	0.028 *	0.071 ***	0.091 ***	0.100 ***
	(0.016)	(0.014)	(0.014)	(0.014)	(0.016)
Parental Education: College or Above	0.119	0.140 *	0.447 ***	0.444 ***	0.357 ***
	(0.079)	(0.069)	(0.069)	(0.067)	(0.074)
Parental Expectation on Children's Education	0.183 ***	0.248 ***	0.132 ***	0.146 ***	0.156 ***
	(0.027)	(0.024)	(0.024)	(0.024)	(0.027)
Number of Friends: 2-Year College Plan	0.132 ***	0.050	0.007	-0.037	-0.405 ***
	(0.036)	(0.032)	(0.034)	(0.033)	(0.034)

Number of Friends: 4-Year College Plan	0.334 ***	0.240 ***	0.287 ***	0.320 ***	0.547 ***
	(0.035)	(0.031)	(0.032)	(0.031)	(0.034)
High School GPA	0.500 ***	0.276 ***	0.874 ***	1.014 ***	1.113 ***
	(0.057)	(0.051)	(0.053)	(0.053)	(0.057)
Math Course: Highest Level	0.347 ***	0.207 ***	0.360 ***	0.411 ***	0.483 ***
	(0.030)	(0.025)	(0.027)	(0.027)	(0.026)
School Location: Non-Urban	-0.018	0.036	0.009	0.005	-0.357 ***
	(0.088)	(0.076)	(0.077)	(0.074)	(0.074)
School Population: Racial Minority Students	-0.001	0.003	0.004 *	0.005 ***	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
School Population: Free/Reduced-Price Lunch	-0.002	-0.002	-0.007 ***	-0.010 ***	-0.009 ***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
School Population: AP Students	0.002	0.002	-0.002	0.001	-0.002
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Intercept	-3.938 ***	-3.487 ***	-5.306 ***	-6.436 ***	-8.535 ***
	(0.271)	(0.217)	(0.249)	(0.253)	(0.288)
N	14800	14800	14800	14800	14800

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 12

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 1992 (Level Three)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.661 +	-0.248	-0.230	-0.766 *	-0.661 +
	(0.350)	(0.377)	(0.337)	(0.302)	(0.350)
EP	-0.103	0.252	0.252	0.531 **	-0.103
	(0.217)	(0.221)	(0.154)	(0.193)	(0.217)
Latinx	0.015	-0.308 +	-0.302 +	-0.235	0.015
	(0.209)	(0.171)	(0.164)	(0.169)	(0.209)
Other Racial Minority	0.386 *	-0.027	-0.302 *	-0.210	0.386 *
	(0.159)	(0.145)	(0.136)	(0.145)	(0.159)

Female	0.069	0.376 ***	0.258 **	0.256 **	0.069
	(0.105)	(0.088)	(0.088)	(0.089)	(0.105)
Family Income	0.103 ***	0.074 ***	0.043 *	0.116 ***	0.103 ***
	(0.023)	(0.020)	(0.021)	(0.023)	(0.023)
Parental Education: College or Above	0.340 **	0.097	0.035	0.507 ***	0.340 **
	(0.124)	(0.103)	(0.111)	(0.109)	(0.124)
Parental Expectation on Children's Education	0.386 ***	0.139 ***	0.128 ***	0.245 ***	0.386 ***
	(0.040)	(0.025)	(0.026)	(0.024)	(0.040)
Number of Friends: 2-Year College Plan	-0.578 ***	-0.183 ***	-0.058	-0.040	-0.578 ***
	(0.048)	(0.044)	(0.041)	(0.041)	(0.048)
Number of Friends: 4-Year College Plan	0.554 ***	0.459 ***	0.266 ***	0.353 ***	0.554 ***
	(0.052)	(0.043)	(0.042)	(0.042)	(0.052)
High School GPA	1.032 ***	0.655 ***	0.683 ***	0.891 ***	1.032 ***
	(0.089)	(0.084)	(0.088)	(0.093)	(0.089)
Math Course: Total Units	0.467 ***	0.303 ***	0.163 **	0.434 ***	0.467 ***
	(0.097)	(0.074)	(0.061)	(0.049)	(0.097)
School Location: Non-Urban	-0.106	-0.013	0.170	-0.089	-0.106
	(0.160)	(0.138)	(0.113)	(0.121)	(0.160)
School Population: Racial Minority Students	-0.003	-0.002	-0.005 *	0.003	-0.003
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
School Population: Free/Reduced-Price Lunch	0.000	0.003	0.003	-0.005 +	0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
School Population: AP Students	0.001	0.009	0.001	0.004	0.001
	(0.007)	(0.007)	(0.005)	(0.006)	(0.007)
Intercept	-9.545 ***	-5.286 ***	-5.354 ***	-6.899 ***	-9.545 ***
	(0.519)	(0.387)	(0.327)	(0.367)	(0.519)
N	11170	11170	11170	11170	11170

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

The tables show that after controlling the factors of student habitus and capital and school contexts, all the coefficients for the category of EL students were still negative, and EL students had the smallest log odds of positive college-going achievements among the three student groups; for EP students, the majority of the coefficients were also negative for the most recent cohort (Class of 2013). For the measurement of statistical significance, two coefficients for the category of EL students were statistically significant at the significance level of $\alpha = 0.05$: college enrollment from the Class of 1992, and college search from the Class of 2004. At the significance level of $\alpha = 0.1$, there were four more outcomes that are statistically significant: four-year college enrollment from the Class of 1992, four-year college enrollment from the Class of 2004, and college aspiration and four-year college enrollment from the Class of 2013. Similar to the previous set of models, all the selected factors of student habitus and capital were significantly associated with students' college access outcomes; in terms of the school contexts, students' academic achievements (i.e., high school cumulative GPA and math course-taking patterns) were significantly and positively associated with students' college access outcomes, and some factors of school population characteristics (i.e., percentages of racial minority students and students who received free or reduced-price lunch) were also statistically significant for the outcomes. These results restate that in addition to students' linguistic status, differences in student habitus and capital and the school contexts can largely shape one's college access outcomes.

As for the diachronic changes in EL students' college access, at the significance level of $\alpha = 0.1$, after the variables of student habitus and capital and school contexts are controlled, the results that are comparable across the cohorts are similar to those from the previous models: treating NE students of the same cohort as a reference, while EL students were less likely to

aspire to college, EL students were more likely to have college search activities and enroll in colleges (including four-year colleges) from the 1990s to the 2010s.

Nested Models (Level Four): Controlling Habitus and Capital, School Contexts, and State Contexts

The last set of nested models includes student linguistic status as the explanatory variable, and adds the variables of state contexts in addition to those of student habitus and capital and school contexts. Therefore, this set of models considers the contextualized individual, family, school, and state backgrounds of the three student groups. Findings from the estimated models are provided in Tables 13 to 15, which represent outcomes at the five college access stages from the Classes of 2013, 2004, and 1992.

Table 13

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2013 (Level Four)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.425 +	-0.269	-0.419	-0.135	-0.222	-0.419
	(0.240)	(0.235)	(0.266)	(0.252)	(0.238)	(0.266)
EP	0.020	0.120	-0.032	-0.133	-0.246	-0.032
	(0.155)	(0.165)	(0.147)	(0.140)	(0.159)	(0.147)
Latinx	-0.124	0.015	0.084	0.139	0.397 **	0.084
	(0.141)	(0.148)	(0.127)	(0.124)	(0.149)	(0.127)
Other Racial Minority	-0.039	0.380 ***	0.303 **	0.046	0.105	0.303 **
	(0.100)	(0.110)	(0.097)	(0.081)	(0.099)	(0.097)
Female	0.262 **	0.738 ***	-0.014	0.242 ***	0.213 *	-0.014
	(0.084)	(0.088)	(0.076)	(0.073)	(0.085)	(0.076)
Family Income	0.017	0.006	0.054 ***	0.039 **	0.028	0.054 ***
	(0.017)	(0.018)	(0.014)	(0.013)	(0.019)	(0.014)
Parental Education: College or Above	0.257 **	0.187 *	0.426 ***	-0.042	0.518 ***	0.426 ***
	(0.090)	(0.093)	(0.079)	(0.082)	(0.084)	(0.079)
Parental Expectation on Children's Education	0.040 ***	0.032 **	0.069 ***	0.042 ***	0.044 ***	0.069 ***
	(0.011)	(0.012)	(0.010)	(0.010)	(0.011)	(0.010)
Number of Friends: 2-Year College Plan	0.012	0.014	-0.236 ***	-0.070 **	-0.082 *	-0.236 ***
	(0.031)	(0.033)	(0.028)	(0.025)	(0.032)	(0.028)
Number of Friends: 4-Year College Plan	0.302 ***	0.221 ***	0.260 ***	0.148 ***	0.190 ***	0.260 ***
	(0.026)	(0.031)	(0.025)	(0.024)	(0.029)	(0.025)
High School GPA	0.647 ***	0.334 ***	1.470 ***	0.722 ***	1.098 ***	1.470 ***
	(0.063)	(0.068)	(0.072)	(0.064)	(0.072)	(0.072)
Math Course: Highest Level	0.114 ***	0.105 ***	0.184 ***	0.089 ***	0.156 ***	0.184 ***
	(0.018)	(0.018)	(0.015)	(0.015)	(0.018)	(0.015)
School Location: Non-Urban	0.114	0.149	-0.006	-0.129	-0.107	-0.006
	(0.097)	(0.105)	(0.087)	(0.085)	(0.104)	(0.087)

School Population: White Students	-0.007 **	-0.002	-0.005 *	-0.000	-0.009 ***	-0.005 *
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
School Population: Free/Reduced-Price Lunch	-0.008 **	-0.006 *	-0.010 ***	0.000	-0.014 ***	-0.010 ***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
School Population: AP Students	-0.003	0.008 +	0.000	0.001	-0.002	0.000
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)
State Geographic Region: Midwest	0.261 +	-0.112	-0.233 +	-0.123	-0.296 +	-0.233 +
	(0.158)	(0.154)	(0.129)	(0.128)	(0.154)	(0.129)
State Geographic Region: South	0.339 *	-0.222	-0.141	-0.499 ***	-0.487 **	-0.141
	(0.160)	(0.152)	(0.130)	(0.132)	(0.149)	(0.130)
State Geographic Region: West	0.139	-0.347 *	-0.813 ***	-0.292 *	-0.340 *	-0.813 ***
	(0.171)	(0.168)	(0.146)	(0.143)	(0.168)	(0.146)
State: New Immigrant Destination	0.085	0.272 *	0.040	0.112	-0.084	0.040
	(0.122)	(0.128)	(0.113)	(0.104)	(0.122)	(0.113)
State: Other	0.148	0.088	0.158	-0.086	-0.164	0.158
	(0.120)	(0.114)	(0.107)	(0.101)	(0.119)	(0.107)
Intercept	-2.388 ***	-1.224 ***	-6.400 ***	-3.843 ***	-2.428 ***	-6.400 ***
	(0.342)	(0.326)	(0.310)	(0.298)	(0.344)	(0.310)
N	21900	21900	21900	21900	21900	21900

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 14

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 2004 (Level Four)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
EL	-0.285 +	-0.341 *	-0.037	-0.035	-0.384 +
	(0.161)	(0.161)	(0.155)	(0.147)	(0.207)
EP	-0.000	-0.003	0.234 *	0.283 **	-0.217 +
	(0.121)	(0.107)	(0.113)	(0.108)	(0.117)
Latinx	-0.124	-0.007	0.142	-0.047	0.055
	(0.129)	(0.114)	(0.117)	(0.113)	(0.119)

Other Racial Minority	0.055	0.305 ***	0.431 ***	0.126	0.438 ***
	(0.105)	(0.089)	(0.092)	(0.089)	(0.088)
Female	0.179 *	0.627 ***	0.254 ***	0.187 **	-0.093
	(0.071)	(0.059)	(0.064)	(0.061)	(0.061)
Family Income	0.045 **	0.029 *	0.068 ***	0.087 ***	0.100 ***
	(0.016)	(0.014)	(0.014)	(0.014)	(0.016)
Parental Education: College or Above	0.121	0.143 *	0.467 ***	0.450 ***	0.380 ***
	(0.080)	(0.069)	(0.069)	(0.067)	(0.075)
Parental Expectation on Children's Education	0.181 ***	0.248 ***	0.134 ***	0.148 ***	0.161 ***
	(0.027)	(0.025)	(0.024)	(0.024)	(0.027)
Number of Friends: 2-Year College Plan	0.132 ***	0.051	0.007	-0.039	-0.382 ***
	(0.036)	(0.032)	(0.035)	(0.033)	(0.034)
Number of Friends: 4-Year College Plan	0.332 ***	0.240 ***	0.281 ***	0.318 ***	0.522 ***
	(0.035)	(0.030)	(0.032)	(0.031)	(0.034)
High School GPA	0.520 ***	0.278 ***	0.915 ***	1.036 ***	1.200 ***
	(0.058)	(0.052)	(0.054)	(0.054)	(0.058)
Math Course: Highest Level	0.345 ***	0.207 ***	0.350 ***	0.408 ***	0.460 ***
	(0.030)	(0.025)	(0.028)	(0.027)	(0.026)
School Location: Non-Urban	-0.049	0.036	0.006	0.004	-0.374 ***
	(0.090)	(0.078)	(0.078)	(0.075)	(0.075)
School Population: Racial Minority Students	-0.001	0.003 +	0.004 *	0.006 ***	0.005 **
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
School Population: Free/Reduced-Price Lunch	-0.001	-0.002	-0.006 ***	-0.009 ***	-0.009 ***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
School Population: AP Students	0.002	0.002	0.001	0.002	0.001
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
State Geographic Region: Midwest	-0.248 *	0.046	-0.026	-0.057	-0.433 ***
	(0.123)	(0.099)	(0.105)	(0.102)	(0.094)
State Geographic Region: South	-0.355 **	-0.023	-0.393 ***	-0.393 ***	-0.531 ***
	(0.126)	(0.101)	(0.108)	(0.106)	(0.102)
State Geographic Region: West	-0.176	0.003	-0.378 **	-0.197 +	-0.745 ***
	(0.129)	(0.107)	(0.115)	(0.112)	(0.105)
State: New Immigrant Destination	0.070	0.112	-0.082	-0.028	0.250 **

	(0.117)	(0.096)	(0.100)	(0.095)	(0.094)
State: Other	-0.127	0.018	-0.237 **	-0.157 *	0.200 **
	(0.094)	(0.079)	(0.082)	(0.079)	(0.074)
Intercept	-3.664 ***	-3.552 ***	-5.043 ***	-6.228 ***	-8.468 ***
	(0.290)	(0.236)	(0.265)	(0.265)	(0.304)
N	14800	14800	14800	14800	14800

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 15

Estimated Models of the Effect of Linguistic Status on College Access Outcomes for the Class of 1992 (Level Four)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
EL	-0.070	-0.172	-0.126	-0.719 *	-0.580
	(0.343)	(0.389)	(0.345)	(0.302)	(0.366)
EP	-0.148	0.293	0.303 *	0.561 **	-0.077
	(0.224)	(0.224)	(0.152)	(0.190)	(0.212)
Latinx	0.229	-0.198	-0.220	-0.168	0.148
	(0.230)	(0.181)	(0.162)	(0.165)	(0.220)
Other Racial Minority	0.072	-0.018	-0.330 *	-0.208	0.388 *
	(0.186)	(0.153)	(0.141)	(0.144)	(0.170)
Female	0.091	0.353 ***	0.245 **	0.240 **	0.039
	(0.101)	(0.090)	(0.086)	(0.089)	(0.108)
Family Income	0.118 ***	0.070 ***	0.040 +	0.115 ***	0.102 ***
	(0.025)	(0.020)	(0.021)	(0.023)	(0.023)
Parental Education: College or Above	0.204	0.200 +	0.125	0.555 ***	0.455 ***
	(0.124)	(0.106)	(0.107)	(0.109)	(0.128)
Parental Expectation on Children's Education	0.242 ***	0.139 ***	0.131 ***	0.244 ***	0.390 ***
	(0.028)	(0.026)	(0.027)	(0.024)	(0.041)
Number of Friends: 2-Year College Plan	-0.100 +	-0.150 **	-0.026	-0.025	-0.538 ***
	(0.051)	(0.047)	(0.041)	(0.042)	(0.049)
Number of Friends: 4-Year College Plan	0.448 ***	0.443 ***	0.244 ***	0.342 ***	0.533 ***

	(0.051)	(0.044)	(0.042)	(0.042)	(0.052)
High School GPA	0.677 ***	0.791 ***	0.766 ***	0.954 ***	1.207 ***
	(0.093)	(0.099)	(0.093)	(0.096)	(0.101)
Math Course: Total Units	0.391 ***	0.279 ***	0.154 **	0.417 ***	0.436 ***
	(0.059)	(0.075)	(0.059)	(0.050)	(0.096)
School Location: Non-Urban	-0.146	0.052	0.191 +	-0.050	-0.081
	(0.133)	(0.137)	(0.112)	(0.121)	(0.163)
School Population: Racial Minority Students	0.004	0.002	-0.000	0.004 +	0.001
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
School Population: Free/Reduced-Price Lunch	-0.008 **	0.003	0.003	-0.005 +	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
School Population: AP Students	0.002	0.010	0.003	0.004	0.002
	(0.006)	(0.007)	(0.005)	(0.006)	(0.007)
State Geographic Region: Midwest	-0.027	-0.480 ***	0.147	-0.236 +	-0.474 ***
	(0.149)	(0.120)	(0.130)	(0.138)	(0.140)
State Geographic Region: South	0.066	-0.966 ***	-0.536 ***	-0.396 **	-0.887 ***
	(0.146)	(0.134)	(0.134)	(0.132)	(0.148)
State Geographic Region: West	-0.115	-1.257 ***	-0.857 ***	-0.609 ***	-1.347 ***
	(0.179)	(0.158)	(0.130)	(0.156)	(0.154)
Intercept	-5.495 ***	-5.062 ***	-5.438 ***	-6.775 ***	-9.486 ***
	(0.418)	(0.420)	(0.341)	(0.374)	(0.535)
N	11170	11170	11170	11170	11170

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

The tables show that after controlling the factors of student habitus and capital, school contexts, and state contexts, all the coefficients for the category of EL students were still negative, and EL students had the smallest log odds of positive college-going achievements among the three student groups. The coefficients for the category of EP students were negative for the later stages of college access for the most recent cohort (Class of 2013). For the measurement of statistical significance, two coefficients for the category of EL students were statistically significant at the significance level of $\alpha = 0.05$: college enrollment from the Class of 1992, and college search from the Class of 2004. At the significance level of $\alpha = 0.1$, three more outcomes were statistically significant: college aspiration and four-year enrollment from the Class of 2004, and college aspiration from the Class of 2013. In these estimated models, all the selected factors of student habitus, capital, and academic records were still significantly associated with students' college access outcomes, and two factors of school population characteristics (i.e., percentages of racial minority students and students who received free or reduced-price lunch) were also statistically significant for the outcomes. At the level of state contexts, the state geographic locations and immigration contexts were associated with students' college access outcomes: students from the Northeastern states were significantly and positively associated with college-going outcomes for most of the stages for all three student cohorts, and students from the non-immigrant destinations were significantly and negatively associated with the later college access stages for students from the Class of 2004.

At the significance level of $\alpha = 0.1$, after the variables of student habitus and capital, school contexts, and state contexts are controlled, the results that are comparable across the cohorts show that: EL students were less likely to have college aspirations from the 1990s to the

2010s; however, they were more likely to have college search activities, enrollment in college (including four-year colleges) in the most recent decade than in the past.

Synthesis

The results show that within the shifting demographic and policy landscapes, the percentages of college-bound EL students as a group have increased over the past three decades, especially at the final access stage, college enrollment. Despite this progress, the college-going achievement gaps between EL students and non-EL students have remained wide in multiple college access stages. However, if we take into consideration the impacting factors from students' non-linguistic college-going environments, findings show that linguistic status was not the sole decisive factor that differentiates EL and non-EL students; the factors of individual habitus and capital, school contexts, and state contexts also shaped students' college-going outcomes, although being an EL student was still a statistically significant factor for some stages and was always negatively associated with college access outcomes. Therefore, when we address the achievement gaps between EL and non-EL students, we should also understand the differences in the individual, family, school, and state resources held by students of different linguistic statuses.

Furthermore, the increase rate in EL college access from the 1990s to the 2000s is more evident than that from the 2000s to the 2010s; EL college access outcomes retrogressed slightly at some of the early college access stages (e.g., college search and application) from the 2000s to the 2010s. These results are evident even after the impacting factors from the individual, family, school, and state backgrounds are controlled. Finally, combined with the descriptive statistics from the previous section, findings show that although a higher percentage of EL students from the Class of 2013 enrolled in college, a smaller proportion of these EL enrolled in four-year,

selective, and non-profit colleges than those from the Class of 2004. Therefore, these results also reveal changes faced by EL students and their educators.

Findings for Research Question Three:

EL Students' Learning Contexts and College-Going Outcomes

This section presents findings for the third research question regarding the associations between EL students' learning contexts and their college-going outcomes. To answer this question, I used the GLMs with the logit link to conduct statistical modeling with the three data sets. The primary focus of the analysis is on EL students; meanwhile, I also provide findings from the analysis of the other two student groups (EP and NE students) as references to understand how EL students' outcomes stand within the larger populations.

Class of 2013 (HSLS:09)

This section reports the findings for the Class of 2013. The data source of the results for this section is HSLS:09 Second Follow-up Restricted-use Data File (2016). GLMs with the logit link were built for the EL students of the high school Class of 2013 at each of the five college access stages. The same set of models were also built for the EP and NE students as references.

EL Students. Table 16 reports the six estimated models at each college access stage outcomes for EL students from the Class of 2013: college aspiration, college search, college application, admission into the first college a student applied for, college enrollment, and four-year college enrollment.

Table 16

Estimated Model of Learning Contexts on EL students' College Access Outcomes (Class of 2013)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
Latinx	-0.752	1.022	-1.553	-0.602	0.743	-1.391 *
	(0.639)	(0.680)	(0.958)	(0.660)	(0.624)	(0.665)
Other Racial Minority	-0.223	0.298	-0.645	-0.097	-0.247	-0.723
	(0.671)	(0.672)	(1.001)	(0.702)	(0.651)	(0.660)
Female	-0.254	0.207	-0.348	0.317	0.382	-0.182
	(0.420)	(0.430)	(0.596)	(0.531)	(0.422)	(0.522)
Family Income	0.032	0.199 +	-0.218 +	-0.000	-0.047	0.109
	(0.101)	(0.109)	(0.122)	(0.106)	(0.101)	(0.098)
Parental Education: College or Above	0.556	1.090 *	1.534 *	0.602	1.127 *	0.982 +
	(0.460)	(0.526)	(0.691)	(0.586)	(0.495)	(0.504)
Parental Expectation on Children's Education	0.049	0.028	-0.113	-0.059	-0.090 +	0.167 **
	(0.051)	(0.053)	(0.070)	(0.068)	(0.054)	(0.059)
Number of Friends: 2-Year College Plan	0.150	0.206	0.197	0.053	-0.185	-0.271 +
	(0.144)	(0.158)	(0.169)	(0.138)	(0.136)	(0.160)
Number of Friends: 4-Year College Plan	0.272 *	0.394 **	0.341 +	0.321 *	0.239 +	0.237
	(0.121)	(0.141)	(0.193)	(0.151)	(0.134)	(0.160)
High School GPA	0.004	0.659 *	1.913 ***	0.908 **	1.295 ***	1.498 ***
	(0.301)	(0.335)	(0.466)	(0.346)	(0.385)	(0.405)
Math Course: Highest Level	0.270 **	0.021	0.065	0.211 **	0.099	0.151
	(0.091)	(0.095)	(0.131)	(0.080)	(0.103)	(0.092)
School Location: Non-Urban	-0.494	0.717	0.171	0.230	0.502	-0.641
	(0.460)	(0.531)	(0.584)	(0.610)	(0.480)	(0.569)
School Population: White Students	-0.000	0.013	-0.025	-0.000	-0.015	-0.028 *
	(0.011)	(0.012)	(0.016)	(0.013)	(0.011)	(0.014)
School Population: Free/Reduced-Price Lunch	-0.002	-0.008	-0.025	0.007	-0.023	-0.025
	(0.014)	(0.016)	(0.019)	(0.017)	(0.014)	(0.018)
School Population: AP Students	0.006	0.019	-0.040	0.006	-0.006	-0.038
	(0.022)	(0.023)	(0.028)	(0.023)	(0.019)	(0.026)

State Geographic Region: Midwest	0.628	1.165	-0.830	-1.016	-1.298 +	-0.093
	(0.741)	(1.123)	(0.972)	(0.885)	(0.724)	(0.801)
State Geographic Region: South	0.853	-1.259	-1.304	-0.949	-2.042 **	-0.486
	(0.726)	(0.825)	(0.996)	(0.817)	(0.694)	(0.764)
State Geographic Region: West	0.457	0.133	-2.233 *	-0.255	-0.991	-0.265
	(0.633)	(0.718)	(1.005)	(0.739)	(0.650)	(0.600)
State: New Immigrant Destination	-0.285	1.020	-0.926	0.722	-0.185	0.580
	(0.652)	(0.773)	(1.064)	(0.967)	(0.718)	(0.854)
State: Other	0.903 +	-0.328	-1.069	0.039	-0.604	-1.017
	(0.537)	(0.598)	(0.662)	(0.650)	(0.515)	(0.644)
Intercept	-3.118 +	-4.224 *	3.026	-5.742 **	-0.410	-3.427 +
	(1.883)	(1.996)	(2.840)	(2.201)	(1.869)	(2.082)
N	670	670	670	670	670	670

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Based on the point estimates for the coefficients of the variables, the models show that students' college-going activities and outcomes were positively associated with the following variables for most of the college access stages (i.e., the logarithm of the odds ratios are positive): parents' highest level of education (with college education or above), number of friends who planned to attend four-year colleges, high school cumulative GPA, the highest level of math courses, and non-urban school. In contrast, students' college-going activities and outcomes were negatively associated with the following variables for most of the college access stages: Latinx and other racial minority students, percentage of White students at the high school that a student attended, percentage of students who received free or reduced-price lunch at the high school that a student attended, state geographic regions of the Midwest, South, or West, and states that are non-immigrant destinations. More detailed analyses of the statistically significant factors that impact EL students' college access at each stage are reported in the following content.

First, the variables that were statistically significant for whether an EL student from the Class of 2013 had college aspirations include: number of friends who planned to attend four-year colleges, and the highest level of the math course a student took. More specifically, if all other characteristics and contexts were equal[4], EL students were more likely to have college aspirations if (1) they had more friends who planned to attend four-year colleges; (2) they took higher levels of math courses.

Second, the variables that were statistically significant for whether an EL student from the Class of 2013 had college search activities include: parents' highest level of education, number of friends who planned to attend four-year colleges, and high school cumulative GPA.

[4] It is very important to acknowledge that the condition that "all other characteristics and contexts are equal" is only assumed in the statistical inference for comparison. This idealized condition, however, is often altered by the real contexts, including the issues of inequity in society. Thus the statistical inference is vulnerable to the real conditions.

More specifically, if all other characteristics and contexts were equal, EL students were more likely to have college search activities if: (1) their parents had college education or above; (2) they had more friends who planned to attend four-year colleges; (3) they had higher high school cumulative GPA.

Third, the variables that were statistically significant for whether an EL student from the Class of 2013 applied for college include: parents' highest level of education, high school cumulative GPA, and state geographic region. More specifically, if all other characteristics and contexts were equal, EL students were more likely to apply for college if: (1) their parents had higher levels of education; (2) they had higher high school cumulative GPAs; In contrast, EL students were less likely to apply for college if they studied in the West.

Fourth, the variables that were statistically significant for whether an EL student from the Class of 2013 was admitted into the first college they applied to are: number of friends who planned to attend four-year colleges, high school cumulative GPA, and the highest level of the math course a student took. More specifically, if all other characteristics and contexts were equal, EL students were more likely to be admitted into the first college they applied to if (1) they had more friends who planned to attend four-year colleges; (2) they had higher cumulative GPAs; (3) they took higher levels of math courses.

Fifth, the variables that were statistically significant for whether an EL student from the Class of 2013 enrolled in college include: parents' highest level of education, high school cumulative GPA, and state geographic region. More specifically, if all other characteristics and contexts were equal, EL students were more likely to enroll in college if: (1) their parents had college education or above; (2) they had higher cumulative GPAs. In contrast, EL students were less likely to enroll in college if they studied in the South.

Finally, In terms of the four-year college enrollment, the variables that were statistically significant for whether an EL student from the Class of 2013 enrolled in a four-year college include: race and ethnicity, parental expectations on their children's education, and high school cumulative GPA, and percentage of White students at the school they attended. More specifically, if all other characteristics and contexts were equal, EL students were more likely to enroll in four-year colleges if: (1) their parents had higher levels of education; (2) they had higher cumulative GPAs. In contrast, EL students were less likely to enroll in four-year colleges if (2) they are Latinx students; (2) they attended high schools with higher percentages of White students.

Synthesis. The results show several patterns about the learning contexts and EL students' college-going outcomes from the high school Class of 2013. First of all, factors from all levels of the contexts (e.g., individual, family, school, and state contexts) impacted EL students' college access at certain stages. Meanwhile, different factors of the learning contexts played different roles at the different college access stages during the high school Class of 2013 EL students' college-going activities. The majority of the influential factors, however, feature students' habitus, capital, and their academic records. At the stage of college aspiration, students' social capital and academic records were significantly and positively associated with EL students' college-going aspirations. At the stages of college search, application, and admission (in terms of the admission status to the first college students applied to), the learning contexts of individual and family backgrounds were significantly and positively associated with EL students' college-going activities. Students with more cultural and/or social capital (i.e., higher levels of parental education or more friends who planned to attend college) and higher levels of academic records (i.e., higher high school cumulative GPAs and/or higher levels of math courses) were more likely

to have college search activities and apply to college. Additionally, EL students who studied in the West were less likely to apply for college compared to those who studied in the other geographic regions. Finally, similar to the college application stage, the association between EL students' college enrollment outcomes and the learning contexts of individual, family, and school backgrounds were also statistically significant. More EL students enrolled in college if they had higher levels of cultural capital and academic records. EL students who studied in the South, however, were less likely to enroll in college. More specially, for the four-year college enrollment, in addition to EL students' cultural capital and academic record, race and ethnicity and school demographic composition also impacted the outcomes: EL students who are Latinx and who studied at high schools were less likely to enroll in four-year colleges.

Furthermore, one important finding is that for EL students from the Class of 2013, if all other given factors were considered, the factor of economic capital (i.e., family income) was not a statistically significant factor for any stages. Also, the factors of school demographic and socio-cultural contexts (e.g., school urbanicity and school populations of students who received free/reduced-price lunch) and state immigration contexts were not statistically significant factors for any stages. Aligning with the past studies that emphasize the larger effects of individual and family resources on academic outcomes than those of school, district, and state contexts (e.g., see Coleman, 1968; Jencks & Phillips, 2000), the results from this study also demonstrate that students' individual and family backgrounds (i.e., cultural and social capitals and academic records) seem to be able to partly compensate for the educational achievement gaps between schools and states of different contexts.

EP and NE students. To provide references for EL students' college access, Tables 17 and 18 report how different factors impacted the college-going outcomes of EP and NE students

from the Class of 2013. Overall, the two tables show that EP students' social capital and academic records, and their school and state contexts were associated with most of their college-going outcomes. In addition to these factors, NE students' race and ethnicity, gender, and their economic and social capitals were also statistically significant factors that impacted the college access results.

Table 17

Estimated Model of Learning Contexts on EP students' College Access Outcomes (Class of 2013)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
Latinx	-0.303	-0.755 +	-0.987 +	0.099	-0.759 +	-0.156
	(0.365)	(0.445)	(0.583)	(0.317)	(0.392)	(0.299)
Other Racial Minority	-0.684 +	0.031	-0.310	-0.006	-0.579	-0.026
	(0.409)	(0.471)	(0.648)	(0.325)	(0.434)	(0.337)
Female	-0.026	0.627 *	-0.107	0.531 *	-0.231	-0.137
	(0.226)	(0.250)	(0.320)	(0.234)	(0.230)	(0.233)
Family Income	-0.020	-0.021	-0.027	0.058	-0.065	0.037
	(0.051)	(0.070)	(0.095)	(0.050)	(0.064)	(0.049)
Parental Education: College or Above	-0.130	-0.358	-0.339	-0.298	-0.089	0.270
	(0.247)	(0.293)	(0.352)	(0.245)	(0.245)	(0.245)
Parental Expectation on Children's Education	0.050 +	0.001	0.011	0.056 *	0.013	0.092 ***
	(0.029)	(0.032)	(0.039)	(0.026)	(0.029)	(0.025)
Number of Friends: 2-Year College Plan	0.010	0.001	-0.054	0.009	-0.150	-0.164 *
	(0.085)	(0.091)	(0.122)	(0.078)	(0.101)	(0.070)
Number of Friends: 4-Year College Plan	0.308 ***	0.321 ***	0.329 **	0.029	0.225 *	0.191 **
	(0.074)	(0.091)	(0.107)	(0.079)	(0.096)	(0.073)
High School GPA	0.867 ***	0.540 **	1.655 ***	0.445 *	1.435 ***	1.767 ***
	(0.175)	(0.195)	(0.305)	(0.186)	(0.196)	(0.213)
Math Course: Highest Level	0.021	0.027	0.137	0.156 ***	0.083	0.073 +
	(0.053)	(0.053)	(0.084)	(0.047)	(0.051)	(0.042)
School Location: Non-Urban	0.475 *	0.303	-0.192	-0.164	-0.251	0.060
	(0.228)	(0.275)	(0.329)	(0.226)	(0.254)	(0.209)
School Population: White Students	-0.021 **	-0.007	-0.001	0.004	-0.007	-0.014 *
	(0.007)	(0.007)	(0.009)	(0.006)	(0.007)	(0.005)
School Population: Free/Reduced-Price Lunch	-0.020 **	-0.011	-0.003	-0.000	-0.014 +	-0.009
	(0.008)	(0.007)	(0.010)	(0.006)	(0.008)	(0.006)
School Population: AP Students	-0.003	0.017 +	-0.002	0.000	-0.003	-0.002
	(0.010)	(0.010)	(0.013)	(0.007)	(0.010)	(0.008)

State Geographic Region: Midwest	-0.405	-0.353	-1.144 *	0.172	-0.897 *	-1.025 **
	(0.328)	(0.437)	(0.534)	(0.367)	(0.376)	(0.334)
State Geographic Region: South	-0.087	-0.428	-1.767 **	-0.153	-1.292 ***	-0.575 +
	(0.325)	(0.450)	(0.555)	(0.348)	(0.385)	(0.319)
State Geographic Region: West	-0.656 +	-0.874 *	-1.322 *	-0.013	-1.167 **	-1.683 ***
	(0.347)	(0.440)	(0.539)	(0.370)	(0.378)	(0.348)
State: New Immigrant Destination	0.478	0.649	-0.459	-0.021	-0.569 +	0.122
	(0.305)	(0.418)	(0.462)	(0.296)	(0.309)	(0.316)
State: Other	0.776 **	0.305	-0.703 +	0.042	-0.495 +	0.383
	(0.283)	(0.318)	(0.414)	(0.286)	(0.288)	(0.293)
Intercept	-0.302	0.431	-0.520	-4.172 ***	-0.160	-5.234 ***
	(1.055)	(1.013)	(1.391)	(0.838)	(0.955)	(0.941)
N	3170	3170	3170	3170	3170	3170

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 18

Estimated Model of Learning Contexts on NE students' College Access Outcomes (Class of 2013)

	Aspiration	*Search*	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
Latinx	-0.168	0.006	0.331	0.149	0.512 **	0.071
	(0.182)	(0.182)	(0.222)	(0.148)	(0.196)	(0.146)
Other Racial Minority	0.010	0.343 **	0.316 *	0.066	0.100	0.411 ***
	(0.105)	(0.115)	(0.142)	(0.085)	(0.105)	(0.101)
Female	0.352 ***	0.773 ***	0.363 **	0.173 *	0.286 **	0.018
	(0.091)	(0.094)	(0.115)	(0.073)	(0.092)	(0.077)
Family Income	0.018	0.007	0.062 *	0.039 **	0.044 *	0.051 ***
	(0.018)	(0.019)	(0.024)	(0.013)	(0.019)	(0.015)
Parental Education: College or Above	0.291 **	0.216 *	0.388 ***	-0.017	0.555 ***	0.446 ***
	(0.097)	(0.098)	(0.114)	(0.084)	(0.090)	(0.084)
Parental Expectation on Children's Education	0.035 **	0.038 **	0.053 ***	0.043 ***	0.060 ***	0.062 ***
	(0.012)	(0.013)	(0.015)	(0.010)	(0.012)	(0.011)

Number of Friends: 2-Year College Plan	0.005	0.006	-0.044	-0.088 **	-0.058 +	-0.243 ***
	(0.033)	(0.036)	(0.040)	(0.027)	(0.034)	(0.031)
Number of Friends: 4-Year College Plan	0.311 ***	0.197 ***	0.251 ***	0.167 ***	0.180 ***	0.275 ***
	(0.029)	(0.033)	(0.038)	(0.025)	(0.030)	(0.027)
High School GPA	0.652 ***	0.281 ***	0.990 ***	0.794 ***	1.051 ***	1.421 ***
	(0.069)	(0.073)	(0.092)	(0.065)	(0.078)	(0.073)
Math Course: Highest Level	0.126 ***	0.126 ***	0.159 ***	0.071 ***	0.170 ***	0.213 ***
	(0.018)	(0.019)	(0.027)	(0.015)	(0.020)	(0.016)
School Location: Non-Urban	0.083	0.087	-0.140	-0.124	-0.133	-0.010
	(0.110)	(0.119)	(0.147)	(0.089)	(0.115)	(0.095)
School Population: White Students	-0.006 *	-0.002	-0.012 ***	-0.001	-0.009 ***	-0.003
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
School Population: Free/Reduced-Price Lunch	-0.006 *	-0.004	-0.010 **	-0.000	-0.013 ***	-0.011 ***
	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)	(0.002)
School Population: AP Students	-0.003	0.005	0.001	0.001	-0.001	0.003
	(0.004)	(0.005)	(0.006)	(0.003)	(0.005)	(0.004)
State Geographic Region: Midwest	0.386 *	-0.097	0.135	-0.185	-0.172	-0.058
	(0.185)	(0.166)	(0.185)	(0.131)	(0.171)	(0.129)
State Geographic Region: South	0.409 *	-0.157	-0.079	-0.579 ***	-0.299 +	0.004
	(0.190)	(0.164)	(0.188)	(0.140)	(0.167)	(0.134)
State Geographic Region: West	0.336	-0.237	-0.101	-0.381 **	-0.193	-0.579 ***
	(0.209)	(0.187)	(0.214)	(0.142)	(0.196)	(0.140)
State: New Immigrant Destination	-0.014	0.234 +	-0.230	0.135	-0.011	-0.027
	(0.144)	(0.139)	(0.181)	(0.110)	(0.138)	(0.117)
State: Other	-0.042	0.088	-0.323 +	-0.092	-0.032	0.088
	(0.143)	(0.127)	(0.165)	(0.100)	(0.138)	(0.105)
Intercept	-2.659 ***	-1.245 ***	-1.767 ***	-3.785 ***	-2.910 ***	-6.814 ***
	(0.354)	(0.353)	(0.426)	(0.323)	(0.371)	(0.336)
N	18060	18060	18060	18060	18060	18060

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

The tables show that at the first stage, the factors of social capital and academic records, school contexts, and state contexts impacted EP students' college aspirations. In addition to these abovementioned factors, NE students' college aspirations were also significantly associated with their gender and cultural capital. Second, at the stage of college search, EP students' search activities were significantly and positively associated with their gender, social capital, and academic records, but those who studied in the South were less likely to search for college information. In comparison, for NE students, the statistically significant factors exclusively featured their individual habitus, capital, and academic efforts. At the third stage, the factors that were associated with EP students' college application outcomes with statistical significance include: their social capital, high school cumulative GPA, and state geographic region. Compared to their non-NE peers, NE students' college application outcomes were differentiated by the factors of race and ethnicity, gender, economic, cultural, and social capitals, and school contexts. Fourth, EP students' college admission results were associated with their individual habitus and capital; in addition to factors at the individual and family level, the state geographic region of NE students was also a statistically significant factor. Finally, at the stage of college enrollment, for EP and NE students, the variables that were statistically significant for whether they enrolled in college were similar to the stage of college application. The factors that impacted EP and NE students' four-year college enrollment outcomes include those for their overall college enrollment outcomes. In addition to those, EP students' cultural capital (i.e., parental expectations on children's education) and their school demographic population (i.e., school population of White students) were also associated with their four-year college enrollment outcomes; and the factor of state geographic regions where NE students studied was associated with their four-year college enrollment results.

Class of 2004 (ELS:2002)

This section reports the findings for the Class of 2004. The data source of the results for the Class of 2004 is ELS:2002 Second Follow-up Restricted-use Data File (2006). GLMs with the logit link were built for the EL students of the high school Class of 2004 at each of the five college access stages. In order to provide references for the analyses, models were also built for the EP and NE students.

EL Students. Table 19 reports the five estimated models at each college access stage outcomes for EL students from the Class of 2004: college aspiration, college search, college application, college enrollment, and four-year college enrollment.

Table 19

Estimated Model of Learning Contexts on EL students' College Access Outcomes (Class of 2004)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
Latinx	-0.631	-0.670	-1.059 *	-0.653	-0.972 +
	(0.515)	(0.496)	(0.490)	(0.438)	(0.555)
Other Racial Minority	-0.736	-0.452	-0.549	-0.121	-0.886
	(0.528)	(0.516)	(0.521)	(0.445)	(0.573)
Female	0.266	0.538 +	0.107	-0.139	-0.294
	(0.303)	(0.301)	(0.283)	(0.270)	(0.363)
Family Income	0.011	-0.053	0.102 +	0.075	0.117 +
	(0.059)	(0.060)	(0.054)	(0.054)	(0.062)
Parental Education: College or Above	-0.206	0.116	0.823 **	0.661 *	0.587
	(0.321)	(0.321)	(0.306)	(0.286)	(0.390)
Parental Expectation on Children's Education	0.170	0.220 +	0.126	0.172 +	0.237 +
	(0.110)	(0.126)	(0.104)	(0.102)	(0.132)
Number of Friends: 2-Year College Plan	0.081	-0.076	-0.123	-0.131	-0.310 +
	(0.150)	(0.148)	(0.145)	(0.140)	(0.178)
Number of Friends: 4-Year College Plan	0.256 +	0.304 *	0.349 *	0.205	0.285 +
	(0.142)	(0.136)	(0.138)	(0.133)	(0.165)
High School GPA	1.037 ***	0.314	0.910 ***	1.361 ***	1.225 **
	(0.256)	(0.254)	(0.225)	(0.257)	(0.417)
Math Course: Highest Level	0.185	0.239 +	0.345 **	0.427 ***	0.545 ***
	(0.131)	(0.126)	(0.121)	(0.124)	(0.149)
School Location: Non-Urban	0.320	-0.013	0.071	0.439	0.056
	(0.324)	(0.315)	(0.327)	(0.299)	(0.393)
School Population: Racial Minority Students	-0.011	0.003	0.006	0.001	0.008
	(0.008)	(0.008)	(0.008)	(0.007)	(0.009)
School Population: Free/Reduced-Price Lunch	0.013	0.002	0.002	0.003	-0.016
	(0.010)	(0.009)	(0.009)	(0.008)	(0.012)
School Population: AP Students	0.011	-0.007	-0.009	-0.006	-0.004
	(0.018)	(0.014)	(0.016)	(0.015)	(0.013)

State Geographic Region: Midwest	-1.296 +	-0.835	-0.667	-0.206	-0.158
	(0.674)	(0.616)	(0.603)	(0.639)	(0.691)
State Geographic Region: South	-1.325 *	-0.375	-1.265 *	-0.780	-0.770
	(0.628)	(0.556)	(0.551)	(0.563)	(0.652)
State Geographic Region: West	-0.860	-0.814	-0.422	-0.112	-1.039
	(0.602)	(0.520)	(0.551)	(0.567)	(0.671)
State: New Immigrant Destination	0.262	0.058	0.264	-1.251 *	-0.984
	(0.610)	(0.646)	(0.690)	(0.582)	(0.682)
State: Other	-0.296	-0.148	-0.467	-0.555 +	-0.394
	(0.375)	(0.371)	(0.342)	(0.337)	(0.396)
Intercept	-2.600 +	-1.938	-4.105 ***	-6.047 ***	-8.196 ***
	(1.338)	(1.184)	(1.138)	(1.293)	(2.027)
N	650	650	650	650	650

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Based on the point estimates for the coefficients of the variables, the models show that students' college-going activities and outcomes were positively associated with the following variables for most of the college access stages: family income, parents' highest level of education (with college education or above), parental expectation on children's education, number of friends who planned to attend four-year colleges, high school cumulative GPA, the highest level of math courses, non-urban school, percentage of racial minority students at the high school that a student attended, percentage of students who received free or reduced-price lunch at the high school that a student attended. In contrast, students' college-going activities and outcomes were negatively associated with the following variables for most of the college access stages: Latinx and other racial minority students, number of friends who planned to attend two-year colleges, state geographic regions of the Midwest, South, or West, and states that are non-immigrant destinations. More specific analyses of the statistically significant factors that impact EL students' college access at each stage are reported in the following content.

First, the variables that were statistically significant for whether an EL student from the Class of 2004 had college aspirations include: high school cumulative GPA, and state geographic region. More specifically, if all other characteristics and contexts were equal, EL students were more likely to have college aspirations if they had higher cumulative GPAs. In contrast, they were less likely to have college aspirations if they studied in the South.

Second, the variables that were statistically significant for whether an EL student from the Class of 2004 had college search activities include: number of friends who planned to attend four-year colleges. More specifically, if all other characteristics and contexts were equal, EL students were more likely to have college search activities if they had more friends who planned to attend four-year colleges.

Third, the variables that were statistically significant for whether an EL student from the Class of 2004 applied for college include: race and ethnicity, parents' highest level of education, number of friends who planned to attend four-year colleges, high school cumulative GPA, the highest level of the math course that a student took, and state geographic region. More specifically, if all other characteristics and contexts were equal, EL students were more likely to apply for college if: (1) their parents had college education or above; (2) had more friends who planned to attend four-year colleges; (3) they had higher cumulative GPAs; (4) they took higher levels of math courses at high school. In contrast, they were less likely to apply for college if: (1) they are Latinx students; (2) if they studied in the South.

Fourth, the variables that were statistically significant for whether an EL student from the Class of 2004 enrolled in college include: parents' highest level of education, high school cumulative GPA, the highest level of the math course a student took, and state immigration context. More specifically, if all other characteristics and contexts were equal, EL students were more likely to enroll in college if: (1) their parents had college education or above; (2) they had higher cumulative GPAs; (3) they took higher levels of math courses. They were less likely to enroll in college if they studied in the states that are new immigration destinations.

Finally, the variables that were statistically significant for whether an EL student from the Class of 2004 enrolled in a four-year college include: high school cumulative GPA, and the highest level of the math course a student took. These factors are mostly similar to those that impacted their overall college enrollment, but the negative impact of studying in new immigrant destinations is not statistically significant for their four-year college enrollment outcomes. More specifically, if all other characteristics and contexts were equal, EL students were more likely to

enroll in four-year colleges if: (1) they had higher cumulative GPAs; (2) they took higher levels of math courses.

Synthesis. Similar to the findings from the results for the high school Class of 2013, different factors of the learning contexts played different roles at the different college access stages during the high school Class of 2004 EL students' college-going activities. The majority of the factors with statistical significance were students' cultural capital, social capital, and academic records as well as the state contexts. The specific significant factors at each stage, however, were slightly different between the Class of 2004 and the Class of 2013. At the stage of college aspiration, EL students' academic records (high school GPA) were positively associated with their college aspirations, but those who studied in the South were less likely to aspire for college than those who studied in other geographic regions. At the stage of college search, EL students' social capital was a statistically significant factor for the outcome. The stage of college application witnessed multi-faceted factors that were statistically significant for EL students: their race and ethnicity (i.e., Latinx students were less likely to apply for college), cultural capital, social capital, academic records, and state geographic region (i.e., EL students who studied in the South were less likely to apply for college). Finally, EL students' cultural capital and academic records were positively associated with their college enrollment, and their academic records were especially important for their four-year college enrollment. Different from the Class of 2013, EL students of the Class of 2004 who studied in the states of new immigrant destinations were less likely to attend college.

Similar to EL students from the Class of 2013, the factors of school demographic and socio-cultural contexts (e.g., school urbanicity and school populations of students who received

free/reduced-price lunch) were not statistically significant factors for any stages for EL students from the Class of 2004.

EP and NE students. Tables 20 and 21 report how different factors impacted the college-going outcomes of EP and NE students from the Class of 2004. Overall, the two tables suggest that, similar to the Class of 2013, EP students' social capital and academic records, and their state contexts were significantly associated with most of their college-going outcomes. In comparison, NE students' race and ethnicity, gender, their economic, cultural and social capitals, academic records, and high school contexts were statistically significant factors that impacted most of their college access results.

Table 20

Estimated Model of Learning Contexts on EP students' College Access Outcomes (Class of 2004)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
Latinx	-0.082	-0.048	-0.178	-0.301	-0.175
	(0.426)	(0.375)	(0.380)	(0.351)	(0.365)
Other Racial Minority	-0.146	0.256	-0.326	-0.102	0.209
	(0.403)	(0.377)	(0.404)	(0.348)	(0.355)
Female	0.347	0.511 *	0.246	0.263	-0.257
	(0.217)	(0.205)	(0.201)	(0.203)	(0.203)
Family Income	-0.005	0.009	0.055	0.041	0.056
	(0.045)	(0.041)	(0.044)	(0.041)	(0.042)
Parental Education: College or Above	0.095	0.151	0.044	0.224	0.433 *
	(0.238)	(0.214)	(0.212)	(0.197)	(0.210)
Parental Expectation on Children's Education	0.106	0.171 *	0.099	0.183 *	0.061
	(0.074)	(0.073)	(0.070)	(0.071)	(0.087)
Number of Friends: 2-Year College Plan	0.241 *	0.023	0.170	0.010	-0.197 +
	(0.105)	(0.115)	(0.104)	(0.104)	(0.100)
Number of Friends: 4-Year College Plan	0.376 ***	0.245 *	0.120	0.050	0.217 *
	(0.088)	(0.099)	(0.111)	(0.097)	(0.105)
High School GPA	0.355 *	0.310 +	0.911 ***	1.014 ***	1.420 ***
	(0.163)	(0.178)	(0.173)	(0.179)	(0.194)
Math Course: Highest Level	0.378 ***	0.249 **	0.449 ***	0.497 ***	0.400 ***
	(0.097)	(0.083)	(0.097)	(0.090)	(0.082)
School Location: Non-Urban	-0.160	-0.296	0.085	0.058	-0.394 +
	(0.235)	(0.204)	(0.215)	(0.200)	(0.208)
School Population: Racial Minority Students	-0.001	-0.002	0.006	0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
School Population: Free/Reduced-Price Lunch	-0.003	0.000	-0.004	-0.007 +	-0.000
	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)
School Population: AP Students	0.006	0.002	0.002	0.006	0.002
	(0.010)	(0.011)	(0.010)	(0.011)	(0.008)

State Geographic Region: Midwest	-0.390	-0.384	-0.747 +	-0.947 *	-0.286
	(0.413)	(0.375)	(0.401)	(0.409)	(0.370)
State Geographic Region: South	-0.488	-0.145	-1.113 **	-0.944 **	0.115
	(0.392)	(0.321)	(0.390)	(0.347)	(0.363)
State Geographic Region: West	-0.287	0.084	-0.865 *	-0.672 *	-0.667 *
	(0.384)	(0.313)	(0.356)	(0.322)	(0.317)
State: New Immigrant Destination	-0.218	0.320	-0.107	-0.085	0.232
	(0.391)	(0.382)	(0.370)	(0.347)	(0.383)
State: Other	-0.008	-0.178	-0.103	0.037	-0.349
	(0.296)	(0.265)	(0.266)	(0.286)	(0.275)
Intercept	-2.947 ***	-2.622 **	-4.085 ***	-4.644 ***	-7.428 ***
	(0.877)	(0.803)	(0.827)	(0.800)	(0.940)
N	2070	2070	2070	2070	2070

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 21

Estimated Model of Learning Contexts on NE students' College Access Outcomes (Class of 2004)

	Aspiration	*Search*	*Application*	*Enrollment*	*Enrollment(4Y)*
Latinx	-0.166	0.034	0.173	0.029	0.022
	(0.180)	(0.150)	(0.149)	(0.157)	(0.188)
Other Racial Minority	0.113	0.336 **	0.542 ***	0.124	0.569 ***
	(0.129)	(0.108)	(0.114)	(0.108)	(0.120)
Female	0.161 +	0.648 ***	0.258 **	0.203 **	-0.069
	(0.093)	(0.079)	(0.084)	(0.078)	(0.073)
Family Income	0.057 *	0.041 *	0.068 ***	0.097 ***	0.104 ***
	(0.023)	(0.018)	(0.018)	(0.018)	(0.024)
Parental Education: College or Above	0.157	0.147 +	0.525 ***	0.487 ***	0.376 ***
	(0.103)	(0.083)	(0.087)	(0.087)	(0.106)
Parental Expectation on Children's Education	0.195 ***	0.267 ***	0.141 ***	0.140 ***	0.172 ***
	(0.035)	(0.028)	(0.029)	(0.032)	(0.036)

Number of Friends: 2-Year College Plan	0.115 **	0.063	-0.013	-0.039	-0.403 ***
	(0.044)	(0.042)	(0.041)	(0.042)	(0.042)
Number of Friends: 4-Year College Plan	0.332 ***	0.236 ***	0.299 ***	0.367 ***	0.575 ***
	(0.046)	(0.036)	(0.040)	(0.041)	(0.042)
High School GPA	0.513 ***	0.273 ***	0.935 ***	1.025 ***	1.205 ***
	(0.075)	(0.061)	(0.071)	(0.074)	(0.076)
Math Course: Highest Level	0.351 ***	0.196 ***	0.339 ***	0.400 ***	0.474 ***
	(0.040)	(0.029)	(0.035)	(0.033)	(0.032)
School Location: Non-Urban	-0.009	0.111	0.012	-0.002	-0.394 ***
	(0.125)	(0.100)	(0.099)	(0.098)	(0.102)
School Population: Racial Minority Students	-0.001	0.004 +	0.004 +	0.007 *	0.005 *
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)
School Population: Free/Reduced-Price Lunch	-0.002	-0.003 +	-0.007 **	-0.010 ***	-0.011 ***
	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)
School Population: AP Students	0.002	0.003	0.001	0.002	0.001
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
State Geographic Region: Midwest	-0.180	0.135	0.065	0.045	-0.449 ***
	(0.161)	(0.126)	(0.144)	(0.149)	(0.127)
State Geographic Region: South	-0.278	-0.001	-0.287 *	-0.306 +	-0.609 ***
	(0.186)	(0.128)	(0.144)	(0.168)	(0.144)
State Geographic Region: West	-0.145	0.011	-0.349 *	-0.164	-0.709 ***
	(0.190)	(0.141)	(0.167)	(0.176)	(0.158)
State: New Immigrant Destination	0.055	0.123	-0.110	-0.019	0.335 *
	(0.173)	(0.118)	(0.137)	(0.154)	(0.132)
State: Other	-0.136	0.053	-0.236 +	-0.162	0.268 *
	(0.127)	(0.093)	(0.122)	(0.125)	(0.110)
Intercept	-3.891 ***	-3.856 ***	-5.161 ***	-6.449 ***	-8.789 ***
	(0.353)	(0.308)	(0.341)	(0.342)	(0.486)
N	12080	12080	12080	12080	12080

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 20 and 21 report that at the first stage, both EP and NE students' college aspirations were significantly and positively associated with their social capital (i.e., number of students with either two-year or four-year college-going plans) and academic records (i.e., high school cumulative GPAs and the highest levels of math courses); in addition, NE students' economic capital (i.e., family income) was also a statistically significant factor for their college aspirations. Second, at the stage of college search, both EP and NE students' college search activities were significantly and positively associated with their gender, cultural and social capitals, and their academic records; in addition, NE students' college aspirations were also significantly and positively associated with their economic capital as well as being non-Latinx racial minority students. At the third stage, EP students were more likely to apply for college when they had better academic records, but were less likely to apply for college if they studied in the South or the West. For NE students, in addition to the academic records and state geographic regions, their race and ethnicity, gender, their economic and symbolic capitals, the diversity of school population, and the state contexts also impacted their college application decisions. Finally, at the college enrollment stage, while similar factors were statistically significant for EP students (cultural capital and academic records, and state contexts), other factors were also associated with NE students' enrollment outcomes. These additional factors include their gender, economic and social capital, and school contexts. As for the four-year college enrollment outcomes, almost all these factors were statistically significant for those of NE students (except for gender and school population of AP students). For the NE students from the Class of 2004, if all other given factors were equal, non-Latinx racial minority students were more likely to perform well than White and Latinx NE students at the stage of four-year college enrollment (as well as the two stages of college search and college application); NE students who studied in the

Northeast and in the states that are not established immigrant destinations were also more likely to enroll in four-year colleges.

Class of 1992 (NELS:88)

This section reports the findings for the Class of 1992. The data source of the results for the Class of 1992 is NELS:88 Third Follow-up Restricted-use Data File (1994). GLMs with the logit link were built for each of the five college access stages for the EL students from the high school Class of 1992. Models were also built for the EP and NE students so that the impacts of the variables on the college access outcomes for these two student groups are also available for analysis.

EL Students. Table 22 reports the five estimated models at each college access stage outcomes for EL students from the Class of 2004: college aspiration, college application, admission to the college that a student was most likely to attend, college enrollment, and four-year college enrollment.

Table 22

Estimated Model of Learning Contexts on EL students' College Access Outcomes (Class of 1992)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
Latinx	0.090	0.101	-0.298	-1.117 +	-1.317
	(0.876)	(0.695)	(0.684)	(0.621)	(0.855)
Other Racial Minority	1.596	0.479	-0.512	-0.385	0.262
	(0.975)	(0.788)	(0.767)	(0.624)	(0.852)
Female	-0.277	0.303	0.736	0.508	-0.249
	(0.752)	(0.502)	(0.539)	(0.529)	(0.599)
Family Income	0.062	0.057	0.092	-0.009	0.302 *
	(0.114)	(0.113)	(0.129)	(0.101)	(0.146)
Parental Education: College or Above	0.831	0.447	0.196	0.006	-0.184
	(0.847)	(0.720)	(0.673)	(0.610)	(0.739)
Parental Expectation on Children's Education	0.246	0.104	0.125	0.305 *	0.441 *
	(0.203)	(0.153)	(0.188)	(0.152)	(0.188)
Number of Friends: 2-Year College Plan	-0.173	-0.068	-0.181	0.018	-0.193
	(0.379)	(0.262)	(0.268)	(0.288)	(0.324)
Number of Friends: 4-Year College Plan	0.570 +	0.357	0.199	0.316	0.580 +
	(0.338)	(0.260)	(0.260)	(0.248)	(0.328)
High School GPA	0.351	0.899 *	0.485	0.978 *	1.661 **
	(0.683)	(0.441)	(0.455)	(0.433)	(0.588)
Math Course: Total Units	0.434	0.411 +	0.351	0.599 **	0.628 +
	(0.291)	(0.248)	(0.283)	(0.226)	(0.351)
School Location: Non-Urban	-0.286	-0.094	0.161	-0.635	0.065
	(0.832)	(0.556)	(0.702)	(0.750)	(0.740)
School Population: Racial Minority Students	-0.005	-0.001	0.000	0.003	0.002
	(0.015)	(0.013)	(0.014)	(0.011)	(0.016)
School Population: Free/Reduced-Price Lunch	-0.011	0.011	0.006	-0.005	0.014
	(0.015)	(0.014)	(0.018)	(0.013)	(0.017)
School Population: AP Students	-0.016	0.042	-0.007	0.035	-0.029
	(0.060)	(0.050)	(0.053)	(0.053)	(0.060)

State Geographic Region: Midwest	0.377	-0.376	-0.271	0.544	-0.139
	(1.414)	(1.226)	(1.209)	(1.146)	(1.496)
State Geographic Region: South	-0.172	-1.035	-1.405	-0.506	-0.180
	(1.107)	(0.810)	(0.919)	(0.931)	(1.019)
State Geographic Region: West	0.446	-1.278	-0.455	-0.040	-0.653
	(1.106)	(0.943)	(0.833)	(1.001)	(1.037)
Intercept	-4.403	-6.071 *	-5.546 *	-6.775 **	-15.166 ***
	(2.935)	(2.458)	(2.519)	(2.171)	(3.909)
Nobs	270	270	270	270	270

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Based on the point estimates for the coefficients of the variables, the models show that students' college-going activities and outcomes were positively associated with the following variables for most of the college access stages: family income, parents' highest level of education (with college education or above), parental expectation on children's education, number of friends who planned to attend four-year colleges, high school cumulative GPA, the highest level of math courses. In contrast, students' college-going activities and outcomes were negatively associated with the following variables for most of the college access stages: number of friends who planned to attend two-year colleges, state geographic regions of the South or West. More specific analyses of the factors with statistical significance that impact EL students' college access at each stage are reported in the following content.

First, the table reports no variables that were statistically significant for whether an EL student from the Class of 1992 had college aspirations or was admitted to the college that they were most likely to attend.

Second, the variable that was statistically significant for whether an EL student from the Class of 1992 applied for college is: high school cumulative GPA. More specifically, if all other characteristics and contexts were equal, EL students were more likely to apply for college if: they had higher high school cumulative GPAs.

Third, the variables that were statistically significant for whether an EL student from the Class of 1992 enrolled in college include: parental expectation on children's education, high school cumulative GPA, and units of math courses that a student took. More specifically, if all other characteristics and contexts were equal, EL students were more likely to enroll in college if: (1) their parents had higher levels of educational expectations for them; (2) they had higher high school cumulative GPAs; (3) they took more units of math courses.

For the four-year college enrollment, the variables that were statistically significant for whether an EL student from the Class of 1992 enrolled in a four-year college include: family income, parental expectation on children's education, and high school cumulative GPA. More specifically, if all other characteristics and contexts were equal, EL students were more likely to enroll in four-year colleges if: (1) they came from families with higher incomes; (2) their parents had higher levels of educational expectations for them; (3) they had higher high school cumulative GPAs.

Synthesis. Compared to HSLS:09 and ELS:2002, NELS:88 has a substantially smaller sample size of EL students. Meanwhile, the analysis of this data set is also limited by the absence of information about the state immigration contexts. Therefore, findings for this cohort may not be as comparable as those for the other two cohorts. In spite of this limitation, some patterns for the associations between the learning contexts and the college access outcomes of the Class of 1992 parallel those for the Classes of 2013 and 2004. First, except for the stages of college aspiration and college admission (where no statistically significant factors are identified), factors from the individual and family contextual levels were the sole factors that were associated with EL students' college access outcomes. Parents' highest educational levels and EL students' academic records were positively associated with their college-going outcomes. Different from the other two cohorts, EL students' economic capital (i.e., family income) was positively associated with their four-year college enrollment, but their social capital and state geographic region were not statistically significant factors for any of the college access stages. Finally, similar to EL students from the other two cohorts, the factors of school demographic and socio-cultural contexts (e.g., school urbanicity and school populations of students who received

free/reduced-price lunch) were not statistically significant factors for any stages for EL students from the Class of 1992.

EP and NE students. Tables 23 and 24 report how different factors impacted the college-going outcomes of EP and NE students from the Class of 1992. Overall, EP students' cultural and social capital, their academic records, and their state contexts were associated with most of their college-going outcomes. In comparison, NE students' race and ethnicity, gender, their economic, cultural, and social capitals, academic records, and state contexts were statistically significant factors that impacted most of their college access results.

Table 23

Estimated Model of Learning Contexts on EP students' College Access Outcomes (Class of 1992)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
Latinx	0.741	-0.339	-0.131	0.389	0.172
	(0.464)	(0.472)	(0.396)	(0.392)	(0.468)
Other Racial Minority	0.042	0.499	0.225	1.116 **	0.593
	(0.467)	(0.500)	(0.351)	(0.414)	(0.435)
Female	0.007	0.768 **	0.187	0.070	0.144
	(0.307)	(0.266)	(0.255)	(0.294)	(0.308)
Family Income	0.045	0.036	-0.009	0.129	-0.007
	(0.088)	(0.066)	(0.051)	(0.091)	(0.058)
Parental Education: College or Above	-0.124	-0.110	-0.306	-0.189	0.031
	(0.414)	(0.341)	(0.300)	(0.359)	(0.348)
Parental Expectation on Children's Education	0.304 **	0.147 +	0.122	0.195 *	0.369 **
	(0.092)	(0.088)	(0.082)	(0.087)	(0.113)
Number of Friends: 2-Year College Plan	0.133	0.057	-0.075	-0.067	-0.379 **
	(0.154)	(0.151)	(0.114)	(0.143)	(0.125)
Number of Friends: 4-Year College Plan	0.298 *	0.297 *	0.258 +	0.273 *	0.402 *
	(0.141)	(0.143)	(0.144)	(0.132)	(0.171)
High School GPA	0.631 +	0.858 ***	0.853 ***	0.847 **	1.492 ***
	(0.344)	(0.256)	(0.250)	(0.299)	(0.251)
Math Course: Total Units	0.464 **	0.059	-0.103	0.447 **	0.269
	(0.162)	(0.180)	(0.137)	(0.143)	(0.192)
School Location: Non-Urban	-0.275	-0.090	0.078	-0.014	-0.007
	(0.371)	(0.283)	(0.273)	(0.324)	(0.326)
School Population: Racial Minority Students	0.001	-0.001	-0.000	0.007	-0.005
	(0.008)	(0.006)	(0.006)	(0.007)	(0.007)
School Population: Free/Reduced-Price Lunch	-0.009	0.001	-0.003	-0.002	0.008
	(0.008)	(0.007)	(0.007)	(0.007)	(0.009)
School Population: AP Students	-0.007	0.012	-0.007	0.016	0.007
	(0.019)	(0.016)	(0.013)	(0.023)	(0.019)

State Geographic Region: Midwest	-0.224	-1.266 **	-0.336	-0.968 *	-0.379
	(0.476)	(0.458)	(0.486)	(0.489)	(0.565)
State Geographic Region: South	-0.630	-1.745 ***	-0.906 *	-1.284 **	-1.051 *
	(0.442)	(0.435)	(0.413)	(0.476)	(0.477)
State Geographic Region: West	-0.937 *	-1.695 **	-0.888 *	-1.215 *	-1.945 ***
	(0.466)	(0.531)	(0.435)	(0.502)	(0.540)
Intercept	-4.947 **	-3.340 *	-3.394 **	-5.400 ***	-8.138 ***
	(1.490)	(1.296)	(1.051)	(1.406)	(1.376)
N	1210	1210	1210	1210	1210

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 24

Estimated Model of Learning Contexts on NE students' College Access Outcomes (Class of 1992)

	Aspiration	*Application*	*Admission*	*Enrollment*	*Enrollment(4Y)*
Latinx	0.194	-0.039	-0.160	-0.055	0.280
	(0.264)	(0.180)	(0.183)	(0.190)	(0.257)
Other Racial Minority	0.052	-0.101	-0.361 *	-0.225	0.376 *
	(0.200)	(0.159)	(0.156)	(0.154)	(0.182)
Female	0.138	0.316 ***	0.240 **	0.253 **	0.020
	(0.105)	(0.094)	(0.092)	(0.093)	(0.115)
Family Income	0.131 ***	0.074 ***	0.044 +	0.123 ***	0.110 ***
	(0.025)	(0.021)	(0.023)	(0.023)	(0.024)
Parental Education: College or Above	0.212 +	0.231 *	0.188	0.655 ***	0.528 ***
	(0.119)	(0.100)	(0.117)	(0.115)	(0.135)
Parental Expectation on Children's Education	0.237 ***	0.144 ***	0.133 ***	0.250 ***	0.395 ***
	(0.027)	(0.026)	(0.028)	(0.025)	(0.044)
Number of Friends: 2-Year College Plan	-0.126 *	-0.165 ***	-0.009	-0.018	-0.565 ***
	(0.052)	(0.046)	(0.044)	(0.044)	(0.053)
Number of Friends: 4-Year College Plan	0.471 ***	0.464 ***	0.248 ***	0.354 ***	0.558 ***
	(0.053)	(0.045)	(0.043)	(0.045)	(0.052)

High School GPA	0.701 ***	0.792 ***	0.767 ***	0.954 ***	1.190 ***
	(0.094)	(0.101)	(0.100)	(0.103)	(0.109)
Math Course: Total Units	0.378 ***	0.297 ***	0.176 **	0.411 ***	0.453 ***
	(0.064)	(0.080)	(0.065)	(0.054)	(0.104)
School Location: Non-Urban	-0.107	0.077	0.204 +	-0.028	-0.084
	(0.146)	(0.154)	(0.123)	(0.128)	(0.182)
School Population: Racial Minority Students	0.005	0.003	-0.001	0.004	0.002
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
School Population: Free/Reduced-Price Lunch	-0.009 **	0.003	0.003	-0.006 +	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
School Population: AP Students	0.004	0.010	0.004	0.003	0.002
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)
State Geographic Region: Midwest	-0.017	-0.439 ***	0.178	-0.221	-0.467 **
	(0.154)	(0.124)	(0.137)	(0.143)	(0.144)
State Geographic Region: South	0.116	-0.929 ***	-0.502 ***	-0.345 *	-0.894 ***
	(0.153)	(0.139)	(0.143)	(0.137)	(0.156)
State Geographic Region: West	-0.031	-1.297 ***	-0.920 ***	-0.651 ***	-1.299 ***
	(0.193)	(0.142)	(0.138)	(0.162)	(0.160)
Intercept	-5.704 ***	-5.277 ***	-5.706 ***	-6.996 ***	-9.690 ***
	(0.415)	(0.422)	(0.364)	(0.391)	(0.560)
N	9690	9690	9690	9690	9690

*Note: + p<0.1; * p<0.05; ** p<0.01; *** p<0.001*

Table 23 and 24 show that at the first stage, EP students' college aspirations were significantly and positively associated with their cultural capital (i.e., parental expectations on their education), social capital (i.e., number of friends who aspired to attend four-year colleges), and their academic records (i.e., the total units of math courses they took); their college aspirations were also negatively associated with the state geographic location of the West. For NE students, their college aspirations were significantly and positively associated with their economic capital (i.e., family income), social capital in terms of the number of friends who aspired to attend four-year colleges, and their academic records (i.e., high school cumulative GPAs and total units of math courses); their college aspirations, however, were negatively associated with the number of friends who planned to attend two-year colleges and the percentage of students who received free/reduced-price lunch at their high schools. At the stage of college application, the statistically significant factors for EP students include: gender, social capital, academic records, and state geographic regions. In addition to these factors, NE students' college application outcomes were also associated with economic and cultural capitals. Next, EP students' college admission outcomes were significantly associated with academic records and state geographic regions; other than these two factors, NE students' college admission outcomes were also significantly associated with race and ethnicity, cultural and social capitals. At the final college access stage, EP students' college enrollment outcomes were significantly associated with their race and ethnicity, cultural and social capitals, academic records, and state geographic regions; similar factors were statistically significant for their four-year college enrollment outcomes except for race and ethnicity. In contrast, NE students' college enrollment outcomes were significantly associated with their gender, economic, cultural, and social capitals, academic records, and state geographic region; similar factors were statistically significant for their four-

year college enrollment outcomes except that the factor of race and ethnicity replaced the factor of gender.

CHAPTER 6

DISCUSSION

This is the first study that uses multiple nationally representative data sets to investigate EL students' college access experiences at the national level. The study broadens the synchronic and diachronic inquiry scopes of studying EL students' high school-to-college transition experiences. The findings from the study also contribute to the current understanding of EL students' K-12 learning experiences, which is primarily based on works such as qualitative inquiries in local school and district settings (e.g., Harklau, 2013; Kanno, 2018) and quantitative analysis of surveys with immigrant-background multilingual students in selected research sites (e.g., Longitudinal Immigrant Student Adaptation Study, or "L.I.S.A.," in Boston and San Francisco areas in the 1990s, see Suárez-Orozco et al., 2008; and Children of Immigrants Longitudinal Study, or "CILS", in Miami/Ft. Lauderdale and San Diego areas in the 1990s, see Portes & Rumbaut, 2001). The results demonstrate that although EL students' college access outcomes have improved over the past three decades, major challenges still exist. Compared to non-EL peers, EL students enrolled in colleges (especially four-year and selective colleges) at far lower rates. This chapter discusses the conclusions and novel findings for the three research questions proposed in the study.

College Access: A Comparison between EL and non-EL Students

The first research question asked whether college-going outcomes and learning environments among students with different linguistic statuses are different. The findings support the following hypotheses proposed by the study: compared to non-EL students, EL students have lower

postsecondary school enrollment rates and more challenging learning environments; EL students are more likely to have fewer resources and support in college access compared to their peers who are proficient in English. Meanwhile, the findings also provide some new evidence about the trends in EL students' college access outcomes and learning environments.

College Access Outcomes

The descriptive statistics show that the college-going rates among all three student groups (EL, EP, and NE students) have increased over the past three decades. Overall, EP students' performance levels were closer to NE students, with most of their college access outcomes slightly lower than those of NE students. However, a huge college-going achievement gap existed between EL students and non-EL (i.e., EP and NE) students: EL students' college access performance levels were consistently the lowest among the three student groups at each of the five milestone stages. First of all, the percentages of EL students without college aspirations and college search activities were always the highest among the three student groups. For example, the percentages of EL students who did not have college search activities in the 2000s and 2010s (35.7% and 29.7%, respectively) were much higher than the proportion of NE students (22.8% and 17.5%, respectively). Students' educational aspirations are influenced by their habitus, and their aspirations would further impact their learning plans and outcomes at high schools (Bohon et al., 2006). Qualitative studies also demonstrate that EL students are often unconfident about their learning abilities due to their habitus and capital (e.g., limited English proficiency, racial minority backgrounds, limited financial resources), therefore preventing themselves from aspiring for advanced high school courses and dreaming of going to college (e.g., see Kanno & Kangas, 2014). The lack of college aspirations and college search activities, as the new evidence from the study shows, would largely restrict students' expectations and knowledge, such as

college types, application processes, and financial information (Bohon et al., 2006). Consequently, these EL students were less likely to have suitable plans and practices for investment in their human capital and to achieve educational and career goals that match their expectations and qualifications.

Associated with the lowest levels of EL students' college aspirations and search activities were the highest percentages of EL students without college applications and college admissions among the three student groups. For example, despite the increasing college application rates of all three student groups, the proportion of EL students who did not apply to college applications (20.9%) was still approximately twice the proportion of EP students (11.8%) and much higher than that of NE students (14.2%) from the most recent cohort in the 2010s. The past research has shown that EL students are easily discouraged from applying to college due to obstacles such as the overwhelming units of ESL courses that prevent them from taking advanced academic courses, limited financial resources as well limited knowledge of financial aid opportunities, and lack of college-going culture, especially minority students' college-going culture at high schools where EL students attend (Callahan, 2005; Callahan et al., 2010; Kim & Díaz, 2013). Therefore, the results about their low application and admission rates echo the negative consequences of these challenges, and call for schools and educators to particularly promote college-going culture among these underrepresented, minority students.

Given these three student groups' different performance levels at the earlier college access stages, the final stage of college access, college enrollment, further reflected the trifurcated outcomes (especially the gaps between EL and non-EL students). One important finding is that although EL students' overall college enrollment rate still lagged behind those of NS and EP students, the gap has narrowed. However, this study provides the new finding that the

increase in EL students' college enrollment rates was largely attributed to their disproportionately large proportions of enrollment in private for-profit postsecondary institutions and two-year or less-than-two-year institutions.

More specifically, the proportion of EL students who attended private for-profit colleges increased very fast. This fact demonstrates that although private for-profit colleges increased dramatically over the past several decades (Cellini, 2021), the impact was far more profound on underrepresented students such as EL students than traditional college-goers. Also, the proportion of students who attended four-year college (especially selective ones) decreased from 2004 to 2013. Research in higher education emphasizes that students who attended community colleges were less likely to obtain a bachelor's degree compared to their peers who attended four-year colleges (Bowen et al., 2009), which would create the educational inequity between EL and non-EL students. This long-lasting, dismaying evidence corresponds to the findings from the past research, which suggests that EL students, even though they were academically qualified and high-achieving, were still more likely to enroll in colleges that they are over-prepared for, such as community colleges and other non-selective colleges (Callahan & Humphries, 2016).

College-going Environments

As the previous subsection demonstrates, Despite the implementation of successive education bills and policies intended to improve EL outcomes over the decades, the gap between EL students' and non-EL students' college-going environments has remained wide. These outcomes were accompanied by the different college-going contexts of EL and non-EL students at multiple levels.

First of all, the family socioeconomic status and parental educational levels of EL students remained the lowest among the three student groups. EL students' average family

incomes were lower than those of EP and NE students; as for parental educational levels, the percentages of both EL and EP students' parents who did not have college education were much higher than those of NE students. The literature documented that language minority students were more likely to come from families with lower incomes and have parents with lower educational levels in the past (e.g., see Núñez et al., 2016; Rodriguez & Cruz, 2009). The gaps between the three student groups, however, have remained mostly unchanged in the past three decades. Furthermore, EL students' had less social capital for college access activities: compared to EP and NE students, they had fewer friends who had four-year college-going plans. High school students' social capital, such as their college-going friends' peer relations and resources can largely influence their decisions and efforts on college completion, and this was especially evident for minority students with limited college knowledge and educational resources (e.g., see Chen et al., 2018; Cherng et al., 2013). These gaps can bring extra obstacles for EL students to achieve higher educational attainment, especially given the fact that these underrepresented EL students' and their families' cultural and social capitals, represented by their multilingual, multicultural, and multifaceted skills and resources, were less likely to be acknowledged and viewed as assets by the dominant social fields wherein they are situated (e.g., communities, schools, other public spaces in society) (Paris & Alim, 2017).

Second, compared to NE students, EL and EP students consistently attended schools with significantly higher percentages of racial minority students, students who received free or reduced-price lunch, and EL students. Also, a large and increasing percentage of EL students attended high schools in the urban areas. These gaps also remained wide over the past three decades. Rodriguez and Cruz (2009) demonstrate that the schooling conditions and challenges of EL students are similar to those of low-income students and students of color. The de facto

school segregation would contribute to the inequity in education among student groups with different linguistic statuses (Schneider et al., 2006; Valdés, 2001). For example, Engberg and Wolniak's (2010) study suggests that high school contexts, particularly the roles such as socioeconomics, academic preparation, and college-linking networks, can influence students' college-going outcomes. Typically, Gándara and Orfield's (2012) work also demonstrates that school segregation exists between EL and non-EL students, which has significant negative consequences for the EL student group.

Furthermore, EL students also lagged behind in terms of their academic achievements. Their cumulative GPAs were consistently the lowest among the three student groups, and they had the lowest average levels of math courses completed during high school. These longitudinally bleak statistics echo scholars' call for reforms for more effective language and academic programs at high schools that can effectively enhance both linguistic and academic performance of EL students (Bailey & Santos, 2009). Therefore, boosting EL students' academic achievement through acknowledging their habitus and cultural capital, strengthening their social capital, as well as connecting high school teaching and learning activities with their multilingual backgrounds through asset-based, culturally sustaining pedagogies are especially needed to prepare them for college.

Additionally, the study also considers the state-level contexts: the majority of EL and EP students studied in the West and South as well as in the states that are established immigrant destinations for the past three decades. Compared to EL and EP students, NE students lived across the states more evenly in terms of state geographical locations and immigration contexts. These facts consolidate the past literature's depictions that EL students tend to concentrate in some typical states (e.g., see Rodriguez & Cruz, 2009); they also provide implications for

educators and policymakers that the educational and immigration policies in the Western and Southern states, as well as the established immigrant destinations, can have substantive impact on the major group of EL and other immigrant-background minority students as well as their K-12 and postsecondary education.

Diachronic Changes in EL Students' College Access

The second research question examines how EL students' college access outcomes have evolved over the past three decades, especially compared to their non-EL peers. The results show that within the shifting demographic and policy landscapes, the percentages of college-bound EL students have increased over time, which aligns with the hypothesis that EL students exhibit more robust college access achievements in the new decade than those in previous decades. In general, these improvements align with the increased focus on ESL and bilingual education at the K-12 level. Since the passage of the *Bilingual Education Act* in the late 1960s, many educational acts and policies have been issued to improve the quality of ESL and bilingual education programs and make them accountable for student progress. For example, the Supreme Court's decision on the *Castañeda v. Pickard* case (1981) requires that all bilingual education programs should be based upon sound educational theories, have effective implementation with educational resources, and have proof that they are helping students overcome language barriers (Hakuta, 2011). The Supreme Court's decision on the *Plyler v. Doe* case (1982) also prevents all students, regardless of their immigration and documentation status, from being denied a free K-12 education in the U.S. These acts have helped immigrant-background EL students, a substantial proportion of whom are undocumented students, to access K-12 education and receive ESL and bilingual services designed to help them improve their language proficiency and prepare them for educational achievement.

However, despite considerable efforts and progress, EL students still face challenges in their college access. In fact, EL students consistently lagged behind their EP and NE peers in college access outcomes; meanwhile, progress in EL college access outcomes slowed down from the 1990s to the 2010s: the increase in EL students' college enrollment rates was more evident from the 1990s to the 2000s than that from the 2000s to the 2010s. Moreover, although a higher percentage of EL students from the Class of 2013 enrolled in college, findings also show that a significantly larger proportion of these EL students enrolled in private for-profit colleges, less-than-four-year, and non-selective colleges than those from the Class of 2004. These results could possibly be attributed to the shifting demographic and policy changes over the past decades. First, the immigrant-background population in the U.S. has increased consistently and significantly over the past decades. For example, the percentage of the foreign-born U.S. population doubled from the 1980s to the 2000s (from 6.2% in the 1980s to 7.9% in the 1990s, and then from 11.1% in the 2000s to 13.7% in the 2010s) (Budiman, 2020). The growing immigrant-background population has required schools and educators to develop bilingual programs and implement language scaffolding services in varying ways at the state- and local-levels, which has led to complicated micro-level contexts and varied educational outcomes across different states and districts (Callahan et al., 2020).

Second, immigration policies became increasingly restrictive in the late 1990s (especially for undocumented students), and these policies could have a lasting impact on immigrant-background students (including EL students) in the long term. The passage of the *Immigration Reform and Control Act* in 1986 (*IRCA-86*) granted many previously undocumented immigrants citizenship, which likely motivated these immigrants, many of whom would have been EL students, to pursue higher education compared to those who did not gain citizenship (Cortes,

2013). The passage of the *Illegal Immigration Reform and Immigrant Responsibility Act* in 1996 (*IIRIRA-96*) began an era of increasing restrictions on undocumented students' educational and career opportunities, including disqualifying these students for in-state tuition at public universities in the states where they resided (Kim & Díaz, 2013).

Third, findings from this study also suggest that linguistic status was not the sole factor that can determine the college-going outcomes of students with linguistically and culturally diverse backgrounds; students' individual habitus and resources at different levels from families, schools, and broader social contexts also had substantive impacts in shaping their academic outcomes, including those of EL students. However, research also suggests that the changes in educational legislation at the federal level, namely the passage of the *No Child Left Behind Act* (NCLB) in 2011 impacted EL students' K-12 educational outcomes. Under NCLB, the term "English language acquisition" replaced the widely-used term "bilingual education" in K-12 education, reflecting a language ideology that prioritizes English-only instruction at the federal policy level (García et al., 2008); moreover, the emphasis on high-stakes English-only standardized assessment and accountability in content subject teaching and learning also clashed with the goals of bilingual education for EL students to develop multilingual academic skills and overcome language barriers (Menken, 2008). Research has thus demonstrated that under NCLB the quality of the ESL and bilingual programs declined, and EL students were less likely to graduate from high school and enroll in college (e.g., see Callahan et al., under review; Darling-Hammond, 2006; Menken, 2008).

Learning Contexts and College Outcomes

The third research question examines how the learning contexts (individual habitus and capital, school, and state) within which EL students live are associated with their college

experience outcomes. The results uphold the hypothesis that EL students' college access outcomes at the five stages are influenced by factors at the individual and family, school, and state levels. Findings also demonstrate that although the specific impacting factors varied across the different cohorts, there were some prominent patterns about the learning contexts and EL students' college-going outcomes in the past three decades. The following sections discuss four aspects of the conclusions: individual habitus and capital, school contexts, state contexts, and a comparison of impacting factors among different student groups.

Individual Habitus and Capital

EL students' habitus and capital, which interact with their individual and family backgrounds and resources, played vital roles in their college-going activities. Their habitus and demographic backgrounds influenced their choices of pursuing higher education. Also, the levels of economic and school-valued cultural and social capitals held by EL students were always positively associated with their college access outcomes. Many factors from this contextual level were particularly important for EL students' college search, application, and enrollment stages.

First, being a racial minority EL student was always negatively associated with college access outcomes. The impact from the factor of race and ethnicity stood out with statistical significance at the stages of college application and enrollment. For example, in the most recent cohort, if all other given factors and contexts were equal, Latinx EL students were less likely to enroll in four-year colleges compared to their White EL peers as well as non-EL students. This fact corresponds to Flores and Rosa's call to bring race into consideration in language education (e.g., see Flores & Rosa, 2019; Rosa & Flores, 2017). They argue that race and language have been co-naturalized both in the historical and contemporary contexts. Researchers also found that many immigrant-background, racial minority students have been conventionally perceived as

"overachievers" that are associated with myths such as the "immigrant advantage" for first-generation immigrants and "model minority" for Asian students; however, these "advantages" did not exist for these minority students who are EL students (e.g., see Callahan et al., 2010; Kanno & Cromley, 2015). Racial minority students who do not speak the dominant language of the society are particularly at disadvantaged positions in institutional settings such as schools and communities, where their multilingual and multicultural capitals are often unrecognized by the field. As a result, these students' teachers and peers tend to have low expectations for their educational attainment, leading to their minimal instruction and scaffolding for their school learning (Callahan & Gándara, 2014). EL students' college enrollment rates would not be improved if many of them even do not have motivations to apply for college and to build up their human capital.

Second, compared to NE students, the impact of gender difference on EL students' college access was less evident. For NE students, if all other given factors and contexts were equal, female NE students were more likely to have better performances than male NE students in the majority of college access stages over the past three decades, including the college enrollment rates. In spite of this finding, it is also very important to acknowledge that the condition that "all other given factors and contexts are equal" is only assumed in the statistical inference for comparison. This idealized condition, however, is often altered or compromised by the real contexts, reflecting issues such as social inequality and inequity. Thus the statistical inference is vulnerable to real conditions. This trend about the gender difference, however, did not exist evidently in EL students' college access with statistical significance. Also, little literature has studied the gender differences in college access within the group of EL students at the national level. Given the inferences from NE students, it may still worth the examination of

gender differences in EL students' college access as this research agenda further develops in the future.

Third, EL students' capital was identified by this study as one of the most consistently influential factors that impacted their college-going experiences from college aspiration to college enrollment outcomes. Overall, this study shows that EL students' economic and cultural capitals from their families were positively associated with their college-going outcomes. Particularly, parents' educational levels was a statistically significant factor that has become more and more important for children's college access in multiple stages from the 1990s to 2010s. Also, parents' expectations for children's education was a statistically significant factor for EL students' college enrollment outcomes (especially enrollment four-year colleges) in the 1990s and 2010s. EL students whose parents did not go to college were particularly at disadvantaged positions in college access. Studies have also shown that parents' socioeconomic status, including their educational levels and social class, can largely reflect their educational expectations, involvement in education, and ways of interactions with children and their schools. Immigrant-background, minority families with higher levels of income and parental education are more likely to be involved in children's education (Hamann & Harklau, 2010; Knight et al., 2004; Mullen, 2009). They communicate frequently with schools, spend time helping children's schoolwork at home, and seek external academic support from community learning centers, after-school programs, and other resources to help their children gain more opportunities to succeed in school and enroll in college (Louie, 2004; Perna, 2004). These impacts, as identified by the previous literature, were also evident in the findings from this study.

Moreover, although relatively less discussed in the literature, the number of EL students' college-going friends was also identified by this research study as an important factor in their

college-going efforts. Two patterns were visible regarding the influence of this factor on EL students' access to college. First, the number of friends who planned to attend four-year colleges has become increasingly influential in EL students' own college-going plans with positive associations from the 1990s to the 2010s: this factor was not a statistically significant factor in the 1990s, and then became a statistically significant factor for two stages in the 2000s (college search and application) and for three stages in the 2010s (college aspirations, college search activities, and college admissions). Second, for EL students, if all other given factors and contexts were equal, the number of their friends who planned to attend two-year colleges, although not a statistically significant factor, was negatively associated with most of their college-going outcomes in the 1990s and 2000s. However, this factor was positively associated with EL students' college-going outcomes at the first four stages in the 2010s. The different associations could be linked back to the findings from the descriptive statistics, which show that for the past three decades, only a small proportion of EL students attended four-year colleges. This is especially the case for the Class of 2013: while 61.6% of EL students enrolled in college, only 20.56% attended four-year colleges. This result shows that EL students' social capital with their college-going friends boosts their access to college education; meanwhile, in addition to developing the overall college-going culture at high schools, a concurrent promotion of four-year college-going paths can further benefit these underrepresented students.

School Contexts

The second aspect of the learning context features EL students' high school contexts. Research has documented how high schools can shape EL students' trajectories into college and career in different ways (e.g., see Santos et al., 2018). First, EL students' academic achievements at schools largely shaped their college-going outcomes. These factors were prominent in almost

all the five access stages across the past three decades. To begin with, like non-EL students, EL students' high school GPA was one of the most important indicators of their college access outcomes. Their high school cumulative GPA was a statistically significant factor with positive associations with multiple college access stages, which has impacted more and more stages from the 1990s to the 2010s. In addition to EL students' cumulative GPA, their math course-taking pattern was also a robust predictor of their success in college admission and enrollment from the 1990s to the 2010s. Research on college access and choice suggests the essential role of math courses as an indicator of college qualifications for the traditional, mainstream college-aspirant students (e.g., see Berkner & Chavez, 1997; Callahan et al., 2016), and evidence from this study confirms this conclusion: this was a strong predictor for NE students at all college access stages for all three high school cohorts; furthermore, this study also shows that the math course-taking pattern was a vital predictor for not only non-EL students but EL students as well. EL students' high school math course-taking pattern was always a positive factor with their college access outcomes, and was also statistically significant for multiple stages for all three cohorts.

Compared to the academic records as well as the college-going friends that EL students have from high schools, findings from this study show that the broader school contexts, including the school demographic compositions and socioeconomic and educational resources, were not statistically significant factors that directly impact EL students' college access outcomes after other specified factors were controlled. Nevertheless, the examination of coefficients for these school contextual factors show that the percentage of racial minority students at high schools was a positive factor for most of the stages for the three cohorts, while the percentage of students who received free and reduced-price lunch was a negative factor for most of the stages for the most recent cohort. Halpern-Manners and his colleagues (2009)

suggest that the socioeconomic, cultural, and educational resources of a school are often associated with the characteristics of its student populations, including their socioeconomic, racial and ethnic, and linguistic backgrounds. Nevertheless, literature has shown that EL students were more likely to attend understaffed high schools with limited resources and certified teachers (Gándara et al., 2003; Santos et al., 2018). Findings from the descriptive statistics also show that overall, EL students have always been overrepresented in urban high schools as well as high schools with higher percentages of EL students and students who received free or reduced-price lunch over the past three decades. Ensuring equitable and equal resources for EL students at the school level is an important agenda to assist their college access.

State Contexts

The last aspect of the learning contexts that this study emphasizes is at the state level. The majority of the literature focuses on EL students' K-12 education at the individual or school levels. In contrast, much less research (especially nationally representative, large-scale quantitative studies) takes EL students' state contexts into consideration (Gándara & Orfield, 2012). As researchers are increasingly emphasizing the investigation of the impact of changing demographic and educational contexts at the state level (e.g., see Callahan et al., under review; Terrazas, 2011), this study also provides some new evidence based on the analysis of the data. First, the influence of the state geographic locations of high schools on EL students' college access was evident. Findings show that the coefficients of the state geographic regions that indicate the Midwest, South, and West were negative for most of the college access stages across the three cohorts. Furthermore, this factor was statistically significant for multiple stages from the Classes of 2004 and 2013. For the Class of 2004, if all other given factors and contexts were equal, studying in the South was a statistically significant factor that was negatively associated

with EL students' college aspirations and college applications; and studying in the West was a statistically significant factor that was negatively associated with EL students' college enrollment outcomes. For the EL students from the Class of 2013, if all other given factors and contexts were equal, studying in the West was a statistically significant factor that was negatively associated with EL students' college applications, and studying in the South was a statistically significant factor that was negatively associated with EL students' college enrollment outcomes. This is especially concerning since the results from the descriptive statistics suggest that majority of EL and EP students studied in the South and West. The findings also show that immigrant-background, non-native English-speaking students (both EL and EP students) who studied in the northeastern states were more likely to attend college. In-depth comparative studies about the causes of EL students' achievement gaps across different geographic regions would provide insights on how targeted educational efforts and scaffolding could support college-going EL students in the states where these learners are more likely to be underachieved.

Findings also suggest that if all other given factors and contexts were equal, EL students who studied in the established immigrant destinations were positively associated with their college-going outcomes in the 2000s and 2010s. The associations, however, were not statistically significant except for the stage of college enrollment from the Class of 2004: EL students who studied in the new immigrant destinations were negatively associated with their college enrollment outcomes. This conclusion also aligns with the past literature that compares established immigrant destinations and new or non-immigrant destinations (e.g., see Dondero & Muller, 2012; Fischer, 2010; Hamann & Harklau, 2010). For example, Fischer's (2010) study reported that immigrant-background students who studied in the new immigrant destinations

were more likely to drop out of schools. Also, Dondero and Muller's research (2012) concluded that despite the fact that high schools in new immigrant destinations had relatively higher levels of educational resources, high schools in established immigrant destinations provided more qualified linguistic support for EL students, which was essential for EL students to develop their language proficiency as well academic skills so as to be college-bound.

Impacting Factors: A Comparison between EL and Non-EL Students

Compared to other factors, the impact of cultural and social capital and academic records on EL students' college access outcomes were more evident. Factors such as parental educational levels, number of friends who aspired to attend four-year colleges, and high school cumulative GPA and math course-taking patterns were always statistically significant and had positive associations with their college-going. In comparison, the factors that impacted non-EL students' college access outcomes with statistical significance were more comprehensive. Meanwhile, the nested models from the previous section report that the linguistic status of being an EL students can significantly impact their college-going outcomes at certain stages, even after the control factors at different levels are taken into account. It is possible that EL students had somewhat different college-going experiences than non-EL students. To this end, the classical college choice and college access models, which have primarily focused on the mainstream native English-speaking college-going students (Bergerson, 2009; Callahan et al., under review), may not fully capture the factors and contexts that impact other underrepresented minority students, including EL students. This difference is especially important since educators, administrators, and researchers have been developing predictive analytics in understanding students' potentials in college access and attainment and providing advice (e.g., see Hannon, 2014; Hoffman & Lowitzki, 2005; Naumann et al., 2003). Therefore, reconceptualizing EL students and other

underrepresented student groups' college access patterns and contexts would be helpful to educate college-aspirant and college-bound students from these minority groups.

Synthesis

In all, the study suggests that although EL students' college-going performance has improved over the past decades, a major achievement gap still exists between EL and non-EL students. EL students have faced challenges during their access to college, and these factors have played different roles at different college access stages from college aspirations to college enrollments. The next chapter focuses on the limitations and implications of this study.

CHAPTER 7

LIMITATIONS AND IMPLICATIONS

Based on statistical analyses, the study provides novel findings on EL students' college access outcomes and their learning contexts within a shifting national and historical backdrop of policy and demographic changes. The following sections discuss the limitations and implications of the study.

Limitations

Some limitations must be noted in the current study. For one, there is a limited representation of EL students in the three data sets. When the NCES conducted these three longitudinal nationally representative surveys, they excluded students who were deemed ineligible to participate in the studies. These excluded students include EL students who were believed to have levels of English proficiency too low to be able to complete the surveys. Therefore, EL students who participated in this study were likely to have higher than average levels of English proficiency and academic skills (and thus be more college-aspirant/bound). In other words, findings from this study may present a more positive picture than the national reality. We, therefore, need more and better data and studies that fully reflect the learning contexts and college access outcomes of EL students at the national level.

The second limitation is associated with the EL student sample size in each data set. As I noted in the chapter of Research Methods, compared to the NE and EP student groups, the sample sizes of EL students are not large in any of the three data sets. These limited sample sizes have restricted the research design in some ways. For example, I had to regroup categorical

variables that had unbalanced and limited sizes within their categories, since the model would not have converged if they were not re-coded. Among these, one prominent variable is race and ethnicity. Non-Latinx racial minority EL students, including Asian, Black, Native American, Pacific Islander, and multiracial EL students were grouped as one category in the GLMs to avoid quasi-complete separation and to make the statistical models converge. A larger sample size that allows a more statistically robust analysis of race and ethnicity would further contribute to this field. While this analysis has significant strengths when providing a portrait of overall national trends, a limitation is that it cannot fully address the myriad of particularistic contextual factors affecting EL students' access at an individual and local level. For example, at the state level, the current study only considers the broad geographic location and the state immigration contexts. A specification of these geographic and/or socioeconomic contexts or the addition of more categories would cause quasi-complete separation in the statistical inferences and threaten the statistical robustness and power of the models.

Moreover, EL students are a heterogeneous group with diverse racial, linguistic, and cultural backgrounds and identities (Kanno & Harklau, 2012; Núñez et al., 2016). They have varying linguistic statuses prior to high school: some of them are newcomers who have been recently classified as EL students, some are long-term EL students who have been classified as EL students since elementary or middle school, while others are current EP students who were former EL students but have been reclassified out of the EL status (Huang et al., 2016; Linquanti & Cook, 2013). Documentation status and access to college in-state tuition and financial aid also differ: some EL students are U.S. citizens or permanent residents, while others are undocumented students. Factors such as these can impact their college pathways, but they are not addressed in broad national databases. Future studies providing more fine-grained analyses of

how these widely varying groups of EL students access college would be valuable to understand heterogeneous pathways (Rodriguez & Cruz, 2009).

Finally, while this study analyzes the associations between EL students' learning contexts and their college access outcomes at different stages, it is also important to note that the statistical methods used in the study do not imply causal inference. Therefore, findings from this study cannot provide rigorous evidence of how these learning contexts caused EL students' different college access outcomes, or vice versa. In order to study the causality between the contexts and outcomes, quantitative methods of causal inferences and data sets that support such inquiries are needed to extend the agenda.

Implications

Current work on EL students' college access is still scant (Núñez et al., 2016). This study contributes to the field by examining how various individual, familial, academic, and broader social factors impact college-bound EL students' learning experiences at different stages of college access. It investigates how their college access outcomes have changed over time. This study also provides implications for research, practice, and policy on teaching and learning with EL students.

Research

This study examines EL students' access using an integrated theoretical framework based on key concepts from the Beckerian theory of human capital, Bourdieusian theory of practice, and college access models. It also proposes an integrated model of EL students' college access experiences, and pushes forward transdisciplinary inquiries on college access, language education, and the social context of education. Further research in this vein can support the

examination of EL students' K-12 learning activities and college access, and provide implications for targeted educational practice to mentor, advise, and advocate for EL students.

This study links the three most recent nationally representative data sets from the NCES secondary longitudinal studies program to understand the historical and national trends in EL students' college access. NCES hosts multiple longitudinal studies that can support research to examine EL and other underrepresented students' multifaceted learning outcomes across K-12 and postsecondary education. Studies of these data sets are important in providing information for educators on issues regarding effective practices in assisting underrepresented students' learning experiences and enhancing equity and inclusion in education. As I write, NCES has initiated a new secondary school longitudinal study (NCES, 2021). Titled as the High School and Beyond Longitudinal Study of 2022 (HS&B:22), this study will collect information from the 9th-grade students as well as their parents, teachers, counselors, and administrators beginning in Fall 2022. New data sets in the future can extend the scope of the national and historical analysis of EL students' study.

Moreover, given the limited sample size of EL students in national-level data sets, working with other data sets that provide larger samples can allow more innovative and robust quantitative analysis. For example, research studies have used school-, district-, and state-level data sets about EL students, which provide larger sample sizes and more targeted information to understand EL students' language learning, academic study, and college access experiences (e.g., see Huang et al., 2016). Some studies have also adopted econometric methods to obtain causal inferences between students' EL status/classification and their K-12 learning patterns and educational outcomes (e.g., see Johnson, 2019, 2020).

In addition to quantitative research designs, more qualitative studies are also needed to explore the micro-level teaching and learning activities of EL students, teachers, counselors, administrators, as well as language education policymakers. Studies that can examine how different educational practices and policies can support or impede EL students' college predispositions, college search, and college application activities are particularly needed to address the college preparation experiences of this heterogeneous group as well as the experiences of EL educators across different state and local contexts. Furthermore, mixed methods designs that connect macro-level analysis of EL students' educational trajectories and micro-level study of their individual experiences can deepen our understanding of their needs and goals.

Practice

This study also has implications for educational practice with EL students, particularly at the high school level. This research suggests a need for dialog with various educational stakeholders, including teachers, counselors, and school administrators, on how to better facilitate and mentor college-bound EL students with the long-term goal of bridging the gap between research and practice and providing more effective research-based guidance for educators and learners in the field of education for EL students.

Schools and Districts. This study shows that although there is a wide gap in college-going between EL and non-EL students, a significant proportion of EL students still attended college in the recent decades. Additionally, high school plays a significant role in both EL and non-EL students' college access experiences at multiple stages, which directly impact important factors such as EL students' academic records, course-taking patterns, and number of friends with two-year and four-year college aspirations. This suggests that schools and districts need to

not only develop college-going cultures, but also specifically make these cultures relevant and responsive to underrepresented students such as EL students (i.e., to heighten the awareness that underrepresented students are college-bound too and may need additional targeted scaffolding). These practices could support EL students' college-going preparatory activities at early stages, such as the college aspiration and search stages.

Second, since the findings demonstrate that students' academic records (e.g., their high school GPAs and math course-taking patterns) are vital in almost all their college access stages from college aspirations to college enrollments, schools and districts also need to ensure that these underrepresented students have access to advanced academic content courses such as honors and AP courses. They should also provide targeted scaffoldings so that students and their families have comprehensive and accurate information about the college application and enrollment processes through flexible approaches such as specialized workshops and meetings.

Teachers and Counselors. Through their interactions with EL students, educators can shape EL students' academic dispositions, identities, and educational goals through multifaceted factors identified in this study and beyond (e.g., college aspirations, social capital, and academic records). Therefore, this study suggests multiple ways that teachers and counselors might address the needs of EL students in their K-12 study and college access. First of all, the widespread tracking system at K-12 schools means that underrepresented students have limited access and information (Callahan et al., 2010; Callahan et al., 2016), and students must often rely on educators' recommendations in order to be able to take advanced courses (Harklau, 2007); these courses, however, can largely determine EL students' high school cumulative GPAs as well as highest levels of content courses, which would further shape EL students' college access as shown in the findings. Consequently, educators need to provide more individualized academic

advising and provide more transparent tracking options for EL students. As EL students usually have limited college knowledge (especially those whose parents did not go to college), it would be helpful for counselors to offer targeted suggestions for them at different stages, especially on college search activities and college applications for racial minority EL students.

The study also demonstrates that having a peer group with college-going plans (especially aspirations to attend four-year colleges) is highly consequential for one's own decisions on college access. However, research studies show that it is common for schools to segregate EL students within ESL programs and to separate them from their non-EL peers (Motha, 2014), limiting their school-valued social capital. Educators should promote the communication and collaboration between EL and non-EL students through curricular and extracurricular activities. Linguistic and cultural exchanges among students with multilingual backgrounds can not only promote the college-going culture within the community, but also benefit both EL and non-EL students to enhance the overall educational equity and justice.

Furthermore, since this study suggests that students' cultural capital and their family support are also crucial for their college-going journeys, teachers and counselors need to work not only with EL students but also with their families, especially those who are from diverse backgrounds with limited knowledge about college education in the U.S. Educators should adopt culturally sustaining pedagogies that embrace students' and families' own culture during their communications, and connect the college knowledge with their identities and backgrounds (Paris & Alim, 2017). They should acknowledge students' multicultural and multilingual backgrounds as assets, and communicate with students and parents early in their high school years about college admission and preparation.

Policy

Given EL students' limited access to college compared to their non-EL peers, this study also emphasizes implications for language education and K-12 education policy. Compared to EL students, EP students achieved higher educational attainment at most of their college access stages. This suggests that schools and districts should implement more research-based ESL and bilingual programs that emphasize both language learning and academic progress, and provide more opportunities for EL students to become fully multilingual and multicultural college-bound students, both inside and outside ESL/bilingual programs.

Second, an important finding from the study is that although the percentages of EL students who enrolled in college have increased over the past three decades, the percentages of those who enrolled in private for-profit and less than four-year colleges have also increased massively. Research has shown that minoritized students enrolled in these postsecondary institutions, especially those who are high-achieving and overprepared, are less likely to graduate with a bachelor's degree and have high postsecondary educational attainment (e.g., see Almon, 2014; Callahan, 2005; Kanno & Cromley, 2015), thus widening the achievement gap between EL and non-EL students. Therefore, districts and colleges should provide transparent and accurate information for underrepresented students, such as EL students, and make sure they have full access to the information as well as resources regarding college choice and college access. Colleges should also be encouraged to proactively reach out to special programs for underrepresented students, including ESL programs, to promote college-going culture and information for these students as well as educators who work with them.

Finally, this study suggests a need to further establish and promote high school-college bridge programs and pathways that specifically target underrepresented students such as EL

students and first-generation college students. These efforts address the needs of ensuring diversity, equity, and inclusion, and can contribute to justice in education.

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APPENDIX A

NCES DATA SET SOURCES AND INFORMATION FOR THE CORE VARIABLES

Table 25

Data Sources and Information for the College Access Stage Outcomes (HSLS:09)

Variable	**Source**	**Level/Range**
Stage 1: College aspiration		
College aspiration	Derived from X2STUEDEXPCT	1 Below college[5] 2 College or above[6]
Stage 2: College search		
College search activities	S2CLGSEARCH	0 No 1 Yes
Stage 3: College application		
Ever applied to college	X4EVRAPPCLG	0 No 1 Yes
Stage 4: College admission		
Whether admitted to the first college applied	Derived from S3APPSTATUS1	0 Other[7] 1 Accepted
Stage 5: College enrollment		
College enrollment	X4EVRATNDCLG	0 No

[5] This level includes the following five categories: less than high school completion; complete HS diploma/GED/alternative HS Credential; start, but not complete certificate/diploma from school providing occ training; complete certificate/diploma from school providing occupational training; don't know.
[6] This level includes the following eight categories: start, but not complete Associate's degree; complete Associate's degree; start, but not complete Bachelor's degree; complete Bachelor's degree; start, but not complete Master's degree; complete Master's degree; start, but not complete Ph.D./M.D./law degree/high level professional degree; complete Ph.D./M.D./law degree/other high level professional degree.
[7] This level includes the following three categories: wait-listed; rejected; no application.

		1 Yes
Enrollment in four-year colleges	Derived from X4PS1LEVEL	0 No 1 Yes
Enrollment in private for-profit colleges	Derived from X4PS1CTRL	0 No 1 Yes
Enrollment in selective colleges	Derived from X4PS1SELECT	0 No 1 Yes[8]

Table 26

Data Sources and Information for the College-Going Contexts (HSLS:09)

Variable	**Source**	**Level/Range**
Habitus and capital		
Race and ethnicity	Derived from X2RACE	1 White 2 Latinx 3 non-Latinx minority[9]
Gender	X2SEX	1 Male 2 Female
Linguistic status	Derived from X2DUALLANG, X3ELLSTATUS, and high school transcript	1 NE students 2 EL students 3 EP students
Family income	X2FAMINCOME	1 Annual family income <= $15,000; 2 Annual family income > $15,000 and <= $35,000 3 Annual family income > $35,000 and <= $55,000 4 Annual family income > $55,000 and <= $75,000 5 Annual family income > $75,000 and <= $95,000

[8] The original variable consists of six levels: (1) highly selective, 4-year institution; (2) moderately selective, 4-year institution; (3) inclusive, 4-year institution; (4) selectivity not classified, 4-year institution; (5) selectivity not classified, 2-year institution; and (6) selectivity not classified, less than 2-year institution. This study considers a postsecondary institution selective one if it is a (1) highly selective 4-year institution or (2) moderately selective 4-year institution.

[9] This level includes the following categories: American Indian/Alaska Native; Asian; Black/African-American; More than one race; Native Hawaiian/Pacific Islander.

		6 Annual family income > $95,000 and <= $115,000 7 Annual family income > $115,000 and <= $135,000 8 Annual family income > $135,000 and <= $155,000 9 Annual family income > $155,000 and <=$175,000 10 Annual family income > $175,000 and <= $195,000 11 Annual family income > $195,000 and <= $215,000 12 Annual family income > $215,000 and <= $235,000 13 Annual family income > $235,000
Parental education	Derived from X2PAREDU	1 Below college education[10] 2 College education or above[11]
Parental expectations on children's education	Derived from X2PAREDEXPCT	0 Don't know 1 Less than high school completion 2 Complete HS diploma/GED/alternative HS credential 3 Start, but not complete certificate/diploma from school providing occupational training 4 Complete certificate/diploma from school providing occupational training 5 Start, but not complete Associate's degree 6 Complete Associate's degree 7 Start, but not complete Bachelor's degree 8 Complete Bachelor's degree 9 Start, but not complete Master's degree 10 Complete Master's degree 11 Start, but not complete Ph.D./M.D./law degree/high level professional degree 12 Complete Ph.D./M.D./law degree/other high level professional degree
Number of friends planning to attend two-year colleges	Derived from S2FR2YPUB	0 Don't know 1 None of them 2 Less than half

[10] This level includes the following categories: less than high school; high school diploma or GED or alternative HS credential; certificate/diploma from school providing occupational training.
[11] This level includes the following categories: Associate's degree; Bachelor's degree; Master's degree; Ph.D/M.D/Law/other high lvl prof degree.

		3 About half 4 More than half 5 All of them
Number of friends planning to attend four-year colleges	Derived from S2FR4Y	0 Don't know 1 None of them 2 Less than half 3 About half 4 More than half 5 All of them
School context		
High school cumulative GPA	X3TGPATOT	Range: 0 to 4
Highest level of math courses	X3THIMATH	0 No math 1 Basic math 2 Other math 3 Pre-algebra 4 Algebra I 5 Geometry 6 Algebra II 7 Trigonometry 8 Other advanced math 9 Probability and statistics 10 Other AP/IB math 11 Precalculus 12 Calculus 13 AP/IB Calculus
School type	Derived from X1CONTROL	1 Public 2 Private[12]
School location	Derived from X1LOCALE	1 Urban 2 Non-Urban[13]
School population: White students	A1WHITESTU	Range: 0 to 100

[12] This level includes the following categories: Catholic; other private.
[13] This level includes the following categories: suburb; town; rural.

School population: students with Free/reduced-price lunch	A1FREELUNCH	Range: 0 to 100
School population: AP students	A1AP	Range: 0 to 100
School population: EL students	A2ELL	Range: 0 to 100
State context		
State geographic region		1 Northeast 2 Midwest 3 South 4 West
State immigration context	Derived from X1STATE	1 Established immigrant destinations 2 New immigrant destinations 3 Other states

Table 27

Data Sources and Information for the College Access Stage Outcomes (ELS:2002)

Variable	**Source**	**Level/Range**
Stage 1: College aspiration		
College aspiration	Derived from F1STEXP	1 Below college[14] 2 College or above[15]
Stage 2: College search		
College search activities	Derived from BYS59K	0 No 1 Yes
Stage 3: College application		
Ever applied to college	F2EVRAPP	0 No

[14] This level includes the following categories: less than high school graduation; GED or other equivalency only; high school graduation only; don't know.
[15] This level includes the following categories: attend or complete 2-year college/school; attend college, 4-year degree incomplete; graduate from college; obtain Master's degree or equivalent; obtain PhD, MD, or other advanced degree.

		1 Yes
Stage 4: College admission		
College admission	NA	
Stage 5: College enrollment		
College enrollment	F2EVRATT	0 No 1 Yes
Enrollment in four-year colleges	Derived from F2PS1LVL	0 No 1 Yes
Enrollment private for-profit colleges	Derived from F2PS1CTR	0 No 1 Yes
Enrollment in selective colleges	Derived from F2PS1SLC	0 No 1 Yes[16]

Table 28

Data Sources and Information for the College-Going Contexts (ELS:2002)

Variable	**Source**	**Level/Range**
Habitus and capital		
Race and ethnicity	Derived from F1RACE_R	1 White 2 Latinx 3 Non-Latinx minority[17]
Gender	F1SEX	1 Male 2 Female
Linguistic status	Derived from F1STLANG and high school transcript	1 NE students 2 EL students 3 EP students

[16] The original variable consists of six levels: (1) highly selective, 4-year institution; (2) moderately selective, 4-year institution; (3) inclusive, 4-year institution; (4) selectivity not classified, 4-year institution; (5) selectivity not classified, 2-year institution; and (6) selectivity not classified, less than 2-year institution. This study considers a postsecondary institution selective one if it is a (1) highly selective 4-year institution or (2) moderately selective 4-year institution.

[17] This level includes the following categories: American Indian/Alaska Native; Asian; Black/African-American; More than one race; Native Hawaiian/Pacific Islander.

Family income	BYINCOME	1 None 2 $1,000 or less 3 $1,001-$5,000 4 $5,001-$10,000 5 $10,001-$15,000 6 $15,001-$20,000 7 $20,001-$25,000 8 $25,001-$35,000 9 $35,001-$50,000 10 $50,001-$75,000 11 $75,001-$100,000 12 $100,001-$200,000 13 $200,001 or more
Parental education	Derived from F1PARED	1 Below college education[18] 2 College education or above[19]
Parental expectations on children's education	BYPARASP	1 Less than high school graduation 2 High school graduation or GED only 3 Attend or complete 2-year college/school 4 Attend college, 4-year degree incomplete 5 Graduate from college 6 Obtain Master's degree or equivalent 7 Obtain PhD, MD, or other advanced degree
Number of friends planning to attend two-year colleges	Derived from F1S65C	0 Don't know 1 None 2 A few 3 Some 4 Most 5 All
Number of friends planning to attend four-year colleges	Derived from F1S65D	0 Don't know 1 None

[18] This level includes the following categories: did not finish high school; Graduated from high school or GED.
[19] This level includes the following categories: attended 2-year school, no degree; graduated from 2-year school; attended college, no 4-year degree; graduated from college; completed Master's degree or equivalent; completed PhD, MD, other advanced degree.

		2 A few 3 Some 4 Most 5 All
School context		
High school cumulative GPA	F1RGP	Range: 0 to 4
Highest level of math courses	F1RMAPIP	1 No math 2 Non-academic 3 Low academic 4 Middle academic 5 Middle academic II 6 Advanced I 7 Advanced II/Pre-calculus 8 Advanced III/Calculus
School type	Derived from BYSCTRL	1 Public 2 Private[20]
School location	Derived from BYURBAN	1 Urban 2 Non-Urban[21]
School population: Racial minority students	CP02PMIN	Range: 0 to 100
School population: students with Free/reduced-price lunch	BYA21	Range: 0 to 100
School population: AP students	F1A22F	Range: 0 to 100
School population: EL students	BYA20	Range: 0 to 100
State context		
State geographic region	BYREGION	1 Northeast 2 Midwest 3 South

[20] This level includes the following categories: Catholic; other private.
[21] This level includes the following categories: suburb; rural.

		4 West
State immigration context	Derived from BYSTATE	1 Established immigrant destinations 2 New immigrant destinations 3 Other states

Table 29

Data Sources and Information for the College Access Stage Outcomes (NELS:88)

Variable	**Source**	**Level/Range**
Stage 1: College aspiration		
College aspiration	Derived from F1S49	1 Below college[22] 2 College or above[23]
Stage 2: College search		
College search activities	NA	
Stage 3: College application		
Ever applied to college	Derived from F2S60A	0 No 1 Yes
Stage 4: College admission		
Whether admitted to the college that you are most likely to attend	Derived F2S60B1A	0 Other[24] 1 Accepted
Stage 5: College enrollment		
College enrollment	Derived from NUMINST	0 No 1 Yes
Enrollment in four-year colleges	Derived from PSEFIRTY	0 No 1 Yes
Enrollment private for-profit	Derived from	0 No

[22] This level includes the following categories: less than high school graduation; high school graduation only; < 2 years trade school; 2+ years trade school.
[23] This level includes the following categories: < 2 years of college; 2/more years of college; finish college; Master's degree; Ph.D., M.D..
[24] This level includes the following three categories: no; don't know; no application.

colleges	PSEFIRTY	1 Yes
Enrollment in selective colleges	NA	

Table 30

Data Sources and Information for the College-Going Contexts (NELS:88)

Variable	**Source**	**Level/Range**
Habitus and capital		
Race and ethnicity	Derived from F3RACE	1 White 2 Latinx 3 Non-Latinx minority[25]
Gender	F3SEX	1 Male 2 Female
Linguistic status	Derived from F2S107 and high school transcript	1 NE students 2 EL students 3 EP students
Family income	F2P74	1 None 2 Less than $1,000 3 $1,001 - $2,999 4 $3,000 - $4,999 5 $5,000 - $7,499 6 $7,500 - $9,999 7 $10,000 - $14,999 8 $15,000-$19,999 9 $20,000-$24,999 10 $25,000-$34,999 11 $35,000-$49,999 12 $50,000-$74,999

[25] This level includes the following categories: Asian/Pacific Islander; Black; Native American; Other.

		13 $75,000-$99,999 14 $100,000-199,999 15 $200,000 or more
Parental education	Derived from F2PARED	1 Below college education[26] 2 College education or above[27]
Parental expectations on children's education	F2P61	1 Less than high school graduation 2 High school graduation 3 < 2 years votech/bus 4 2 years votech/bus 6 <2 years college[28] 7 2 years college 8 Finish college 9 Master's degree 10 PhD/MD/other professional
Number of friends planning to attend two-year colleges	F2S69D	1 None of them 2 A few of them 3 Some of them 4 Most of them 5 All of them
Number of friends planning to attend four-year colleges	F2S69E	1 None of them 2 A few of them 3 Some of them 4 Most of them 5 All of them
School context		
High school cumulative GPA	Derived from high school transcript	Range: 0 to 4
Total units of math courses	F2RMAT_C	Range: 0 to 10
School type	Derived from G10CTRL1	1 Public 2 Private[29]

[26] This level includes the following categories: did not finish high school; high school Graduation or GED; don't know.
[27] This level includes the following categories: high school, some college; college graduation; M.A. or equal; PhD., M.D., other.
[28] The original variable does not use the number "5" to notate a level.

School location	Derived from G10URBAN	1 Urban 2 Non-Urban[30]
School population: Racial minority students	G8MINOR	Range: 0 to 100
School population: students with free/reduced-price lunch	F1C30A	Range: 0 to 100
School population: AP students	F1C30I	Range: 0 to 100
School population: EL students	F1C30G	Range: 0 to 100
State context		
State geographic region	Derived from G10REGON	1 Northeast 2 Midwest 3 South 4 West
State immigration context	NA	

[29] This level includes the following categories: Catholic; private, other religion; private, non-religion; private, not ascertained.
[30] This level includes the following categories: suburb; rural-outside MSA.

APPENDIX B

DESCRIPTIVE TABLE (WEIGHTED)

Table 31

Weighted Means or Percentages of EL, EP, and NE Students (SDs in Parenthesis): College-going Activities and Environments

Variable	Categorical Level	Class of 2013			Class of 2004			Class of 1992		
		EL	EP	NE	EL	EP	NE	EL	EP	NE
College access stages										
College Aspiration	Below college	0.437 (0.047)	0.267 (0.021)	0.253 (0.007)	0.279 (0.026)	0.199 (0.013)	0.148 (0.004)	0.375 (0.065)	0.255 (0.037)	0.197 (0.006)
	College or above	0.563 (0.047)	0.733 (0.021)	0.747 (0.007)	0.721 (0.026)	0.801 (0.013)	0.852 (0.004)	0.625 (0.065)	0.745 (0.037)	0.803 (0.006)
College Search	No	0.297 (0.046)	0.179 (0.018)	0.175 (0.006)	0.361 (0.031)	0.258 (0.015)	0.228 (0.006)			
	Yes	0.703 (0.046)	0.821 (0.018)	0.825 (0.006)	0.639 (0.031)	0.742 (0.015)	0.772 (0.006)			NA
College Application	No	0.209 (0.040)	0.118 (0.013)	0.142 (0.006)	0.337 (0.027)	0.243 (0.014)	0.214 (0.005)	0.653 (0.067)	0.421 (0.038)	0.379 (0.009)
	Yes	0.791 (0.040)	0.882 (0.013)	0.858 (0.006)	0.663 (0.027)	0.757 (0.014)	0.786 (0.005)	0.347 (0.067)	0.579 (0.038)	0.621 (0.009)
College Admission	Accepted	0.264 (0.043)	0.350 (0.024)	0.376 (0.007)				0.165 (0.043)	0.324 (0.028)	0.367 (0.009)
	Other	0.736 (0.043)	0.650 (0.024)	0.624 (0.007)			NA	0.835 (0.043)	0.676 (0.028)	0.633 (0.009)
College Enrollment	No	0.384 (0.045)	0.270 (0.020)	0.266 (0.007)	0.436 (0.028)	0.320 (0.015)	0.276 (0.005)	0.649 (0.048)	0.288 (0.036)	0.274 (0.008)

	Yes	0.616 (0.045)	0.730 (0.020)	0.734 (0.007)	0.564 (0.028)	0.680 (0.015)	0.724 (0.005)	0.351 (0.048)	0.712 (0.036)	0.726 (0.008)
Enrollment (Four-year college)	No	0.794 (0.033)	0.622 (0.023)	0.553 (0.007)	0.782 (0.025)	0.689 (0.013)	0.566 (0.006)	0.867 (0.027)	0.656 (0.029)	0.583 (0.009)
	Yes	0.206 (0.033)	0.378 (0.023)	0.470 (0.007)	0.218 (0.025)	0.311 (0.013)	0.434 (0.006)	0.133 (0.027)	0.344 (0.029)	0.417 (0.009)
Enrollment (Private for-profit college)	No	0.868 (0.038)	0.956 (0.010)	0.967 (0.002)	0.962 (0.010)	0.952 (0.007)	0.960 (0.002)	0.961 (0.015)	0.954 (0.012)	0.966 (0.005)
	Yes	0.132 (0.038)	0.044 (0.010)	0.033 (0.002)	0.038 (0.010)	0.048 (0.007)	0.040 (0.002)	0.039 (0.015)	0.046 (0.012)	0.034 (0.005)
Enrollment (Selective college)	No	0.893 (0.023)	0.721 (0.023)	0.667 (0.007)	0.828 (0.023)	0.784 (0.011)	0.652 (0.005)			
	Yes	0.107 (0.023)	0.279 (0.023)	0.333 (0.007)	0.172 (0.023)	0.216 (0.011)	0.348 (0.005)			NA
Habitus and capital										
Race & ethnicity	White	0.148 (0.024)	0.090 (0.009)	0.615 (0.008)	0.220 (0.026)	0.126 (0.011)	0.686 (0.005)	0.137 (0.028)	0.198 (0.037)	0.767 (0.008)
	Latinx	0.639 (0.040)	0.697 (0.018)	0.113 (0.006)	0.543 (0.028)	0.575 (0.015)	0.087 (0.003)	0.544 (0.062)	0.565 (0.034)	0.054 (0.004)
	Non-Latinx minority	0.214 (0.033)	0.213 (0.016)	0.272 (0.008)	0.238 (0.021)	0.299 (0.012)	0.227 (0.005)	0.318 (0.061)	0.237 (0.021)	0.179 (0.007)
Gender	Male	0.495 (0.047)	0.468 (0.024)	0.510 (0.008)	0.494 (0.028)	0.499 (0.015)	0.494 (0.006)	0.542 (0.061)	0.509 (0.033)	0.501 (0.009)
	Female	0.505 (0.047)	0.532 (0.024)	0.490 (0.008)	0.506 (0.028)	0.501 (0.015)	0.506 (0.006)	0.458 (0.061)	0.491 (0.033)	0.499 (0.009)
Family Income		2.799 (0.169)	3.431 (0.094)	4.445 (0.040)	7.463 (0.156)	8.059 (0.072)	9.195 (0.026)	7.808 (0.463)	9.021 (0.211)	10.346 (0.050)
Parental education	Below College	0.688 (0.041)	0.650 (0.020)	0.428 (0.008)	0.494 (0.028)	0.439 (0.015)	0.246 (0.005)	0.575 (0.085)	0.516 (0.036)	0.270 (0.009)
	College or above	0.312 (0.041)	0.350 (0.020)	0.572 (0.008)	0.506 (0.028)	0.561 (0.015)	0.754 (0.005)	0.425 (0.085)	0.484 (0.036)	0.730 (0.009)

Parental expectations on children's education		6.040 (0.374)	6.948 (0.185)	7.064 (0.059)	5.223 (0.079)	5.469 (0.043)	5.304 (0.015)	7.441 (0.347)	7.985 (0.196)	7.853 (0.039)
Number of friends planning to attend two-year colleges	Don't know	0.192 (0.039)	0.221 (0.021)	0.224 (0.006)	0.006 (0.005)	0.005 (0.002)	0.004 (0.001)			/
	None	0.090 (0.024)	0.119 (0.017)	0.159 (0.005)	0.175 (0.023)	0.146 (0.012)	0.151 (0.004)	0.094 (0.032)	0.207 (0.036)	0.184 (0.008)
	Less than half/A few	0.291 (0.043)	0.255 (0.023)	0.285 (0.007)	0.292 (0.026)	0.285 (0.014)	0.317 (0.006)	0.335 (0.069)	0.297 (0.031)	0.306 (0.009)
	About half/Some	0.250 (0.044)	0.201 (0.020)	0.189 (0.006)	0.323 (0.027)	0.342 (0.015)	0.361 (0.006)	0.324 (0.074)	0.306 (0.030)	0.348 (0.010)
	More than half/Most	0.126 (0.032)	0.152 (0.017)	0.107 (0.005)	0.172 (0.022)	0.193 (0.013)	0.149 (0.004)	0.204 (0.062)	0.162 (0.021)	0.141 (0.006)
	All	0.052 (0.018)	0.051 (0.009)	0.037 (0.003)	0.032 (0.011)	0.028 (0.006)	0.018 (0.002)	0.042 (0.033)	0.028 (0.008)	0.021 (0.003)
Number of friends planning to attend four-year colleges	Don't know	0.218 (0.041)	0.150 (0.017)	0.161 (0.006)	0.003 (0.004)	0.007 (0.003)	0.004 (0.001)			/
	None	0.025 (0.012)	0.034 (0.007)	0.034 (0.003)	0.103 (0.018)	0.112 (0.011)	0.072 (0.003)	0.127 (0.049)	0.089 (0.019)	0.065 (0.005)
	Less than half/A few	0.199 (0.041)	0.135 (0.018)	0.133 (0.006)	0.270 (0.026)	0.227 (0.014)	0.163 (0.005)	0.343 (0.073)	0.228 (0.041)	0.173 (0.007)
	About half/Some	0.171 (0.035)	0.198 (0.021)	0.187 (0.006)	0.265 (0.027)	0.246 (0.014)	0.241 (0.005)	0.343 (0.073)	0.228 (0.041)	0.173 (0.007)
	More than half/Most	0.277 (0.043)	0.327 (0.024)	0.327 (0.007)	0.263 (0.026)	0.324 (0.014)	0.427 (0.006)	0.252 (0.066)	0.353 (0.029)	0.43 (0.010)
	All	0.110 (0.027)	0.156 (0.017)	0.158 (0.005)	0.095 (0.018)	0.085 (0.008)	0.092 (0.003)	0.039 (0.020)	0.136 (0.023)	0.121 (0.007)
School context										
GPA		2.378 (0.071)	2.646 (0.030)	2.721 (0.013)	2.368 (0.048)	2.501 (0.026)	2.713 (0.009)	2.378 (0.046)	2.552 (0.054)	2.643 (0.011)
Highest level of math courses		7.176 (0.243)	8.363 (0.126)	8.103 (0.046)	4.660 (0.083)	5.193 (0.050)	5.384 (0.019)			/

Total math Unit				/			/	2.443 (0.101)	3.009 (0.119)	3.108 (0.023)
School type	Public	0.997 (0.001)	0.957 (0.005)	0.923 (0.002)	0.985 (0.005)	0.951 (0.004)	0.915 (0.002)	0.984 (0.030)	0.919 (0.017)	0.894 (0.008)
	Private	0.003 (0.001)	0.043 (0.005)	0.077 (0.002)	0.015 (0.005)	0.049 (0.004)	0.085 (0.002)	0.016 (0.030)	0.081 (0.017)	0.106 (0.008)
School location	Urban	0.560 (0.046)	0.463 (0.024)	0.282 (0.008)	0.424 (0.028)	0.424 (0.015)	0.270 (0.005)	0.254 (0.072)	0.447 (0.033)	0.275 (0.009)
	Non-urban	0.440 (0.046)	0.537 (0.024)	0.718 (0.008)	0.576 (0.028)	0.576 (0.015)	0.730 (0.005)	0.746 (0.072)	0.553 (0.033)	0.725 (0.009)
School population: Racial minority students		0.607 (0.025)	0.621 (0.012)	0.354 (0.006)	0.557 (0.018)	0.578 (0.009)	0.302 (0.003)	0.569 (0.050)	0.543 (0.028)	0.223 (0.006)
School population: students with Free/reduced-price lunch		0.550 (0.026)	0.494 (0.012)	0.369 (0.004)	0.335 (0.015)	0.365 (0.009)	0.237 (0.003)	0.398 (0.037)	0.327 (0.021)	0.186 (0.004)
School population: AP students		0.173 (0.015)	0.185 (0.007)	0.156 (0.002)	0.146 (0.008)	0.148 (0.004)	0.145 (0.002)	0.070 (0.028)	0.084 (0.011)	0.084 (0.003)
School population: EL students		0.153 (0.016)	0.122 (0.008)	0.051 (0.002)	0.126 (0.007)	0.118 (0.004)	0.036 (0.001)	0.083 (0.023)	0.082 (0.011)	0.029 (0.001)
State context										
State geographic region	Northeast	0.122 (0.025)	0.170 (0.023)	0.175 (0.007)	0.127 (0.018)	0.123 (0.009)	0.180 (0.005)	0.118 (0.040)	0.151 (0.020)	0.206 (0.008)
	Midwest	0.107 (0.020)	0.109 (0.008)	0.249 (0.006)	0.154 (0.021)	0.154 (0.011)	0.262 (0.005)	0.079 (0.050)	0.114 (0.017)	0.266 (0.009)
	South	0.337 (0.043)	0.313 (0.019)	0.389 (0.007)	0.259 (0.023)	0.272 (0.013)	0.358 (0.005)	0.269 (0.062)	0.297 (0.029)	0.364 (0.009)
	West	0.435 (0.048)	0.408 (0.024)	0.187 (0.006)	0.461 (0.028)	0.451 (0.015)	0.200 (0.005)	0.533 (0.072)	0.438 (0.035)	0.164 (0.006)
State immigration contexts	EID	0.529 (0.046)	0.674 (0.023)	0.365 (0.008)	0.605 (0.028)	0.642 (0.015)	0.340 (0.006)			
	NID	0.106 (0.019)	0.066 (0.006)	0.228 (0.006)	0.079 (0.014)	0.084 (0.008)	0.220 (0.005)			NA

	Other	0.365 (0.043)	0.260 (0.023)	0.407 (0.007)	0.315 (0.027)	0.273 (0.014)	0.440 (0.006)	