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College Aspirations, Preparation, and Enrollment of First-Generation College Students: The Role of College Counseling Support

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Approval of the Dissertation Committee

This dissertation has been duly read, reviewed, and critiqued by the Committee listed below, which hereby approves the manuscript of Jamilla Jamison as fulfilling the scope and quality requirement for meriting the degree of Doctor of Philosophy in Education.

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Abstract

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It is well documented that college degree attainment can impact lifetime earnings and social mobility. However, research shows that first-generation college students (FGCs) are less likely than their peers to enroll in college after high school. The influence of a college counselor at the high school level as an influential other may positively influence college-going rates for first-generation students and help to close educational attainment gaps between FGCs and non-FGCs. While previous research has examined lower college aspirations, academic preparation, and enrollment rates of FGCs, previous literature has yet to address the role of college counseling support on the four-year college aspirations, academic preparation, and enrollment selectivity levels for FGC students. This dissertation utilizes three separate, but connected studies to examine the college counseling support variables that impact three phases of college choice: 1) 9th and 11th grade college aspirations; 2) college academic preparation; and 3) four-year college enrollment selecitivity levels. The studies are guided by a three-phase college choice theoretical framework that incorporates the impact of college counseling support at each phase.

The three quantitative studies in this dissertation utilize nationally representative, longitudinal data from the National Center for Education Statistics' High School Longitudinal Study of 2009 which surveyed more than 21,000 9th-grade students in 2009. Additional surveys

were administered to students in 2012, 2013 and 2016 as well as to parents, counselors, teachers and school administrators. The studies in this dissertation used independent, dependent, and control variables that span multiple surveys. Linear probability models, linear regressions, and multinomial logistic regressions were used to analyze disparaities in college aspirations, preparation, and enrollment levels among FGCs and non-FGCs. The three studies are the first to use nationally representative data to show that while FGCs are less likely to have access to college counseling support at their high schools. However, the results also found that those FGCs who had access to meaningful college counseling support saw increased college aspirations, academic preparation, and enrollment levels at highly selective four-year institutions.

This dissertation has important policy and practice implications in that it demonstrates the need for prioritization of funding for high school counseling departments by school and district administrators as well as by state legislators. The results of the studies could inform high school college counseling practices and encourage counseling departments to implement comprehensive college counseling curricula that begins in 9th grade and guides students through all three stages of the college choice framework guiding this dissertation.

Dedication

To my husband, Cameron, who has supported me at every turn through this winding doctoral journey. And to Callan, the light of my life, for whom I work tirelessly every day and who makes each day worth living.

Finally, to my brother, Marcus, who gave me the strength to keep going even when the road was rough.

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Finally, I'd like to thank the multitudes of family, friends, and colleagues who cheered me on, prepared and delivered meals, held me accountable, reviewed my writing, cared for my child, and listened with rapt attention as I discussed my topic at length. Completing my dissertation would not have been possible if not for each of your sincere love, grace, and care.

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CHAPTER 1

Introduction

A college degree is an important factor in social mobility and lifetime earnings. Not only does a college degree impact immediate career outcomes, the type of college a student attends impacts both lifetime earnings and socioeconomic status (Mueller, 1998; Zhang, 2005). Data from the Social Security Administration (SSA) indicates that the difference in lifetime earnings for high school graduates versus bachelor's degree earners is approximately $840,000 for men and $587,000 for women when accounting for key variables (Tamborini et al., 2015). A college degree also has overall wellness, health, and civic engagement benefits. College graduates tend to be more satisfied with their employment, exhibit increased exercise habits, engage in political issues, and become active community members (Baum et al., 2013).

Populations who are underrepresented in college such as African American, Latinx, and low-income students historically have lower aspirations to attend college while in high school (Hirschman, 2016). Lower college aspirations for these groups can lead to lack of preparation to enroll in four-year institutions, and lack of knowledge about the college application and financial aid processes. Students from these underserved populations are also likely to be the first in their families to attend college. First-generation college (FGC) students face critical barriers and challenges in college preparation and transition. According to the National Center for Education Statistics (NCES), only 72% of FGC students enrolled in postsecondary education, compared with 93% of their non-FGC peers whose parents earned bachelor's degrees (B.A.) (Cataldi et al., 2018). Lower college attendance rates of FGCs can be explained by various personal, family, and school factors such as lack of college aspirations, under-preparedness for four-year institutions, and lack of guidance through the college search and enrollment processes. There has

been a lack of empirical research that identifies intervenable factors at the secondary school level that may improve the college enrollment outcomes of FGCs over time. Specifically, there is a gap in research directed at understanding how *high school counselors* can support FGCs' college aspirations, preparation, and enrollment levels.

The three interrelated studies in this dissertation contribute to the literature by developing and empirically testing a conceptual framework that aims to understand whether and to what extent college counseling support in high school shape postsecondary aspirations, preparation, and enrollment of FGC students. This dissertation has wider practical and policy implications at the school, district, and state education levels. Results of the studies detailed in this dissertation could inform prioritization and funding of college counseling resources among U.S. high schools that serve FGC students. The studies could have budgetary implications in guidance and college counseling departments nationwide with result suggesting that increasing funding for college counseling resources and hiring more counseling staff could positively influence postsecondary outcomes. Additionally, the dissertation results provide a framework for recommended college preparatory curricular offerings at high schools and encourage state and district education offices to implement college preparatory curricula for all high schools regardless of college-generation and socioeconomic makeup of the student body.

Relevant Literature

Students begin the path to college long before they submit college applications. Students enter high school with pre-determined ideas of their postsecondary options and many students formalize postsecondary education plans by 10th grade. Those who aspire to attend college at the start of high school are more likely to achieve academically and seek out peers with similar postsecondary aspirations resulting in higher college enrollment outcomes (Domina et al., 2011).

Research has found that student demographic factors such as family income and parental education level influence the college aspirations of high school students (McDonough, 1997; Perna, 2000; Wilbur & Roscigno, 2016). Though overall college aspirations among high school students have increased over the past few decades, FGC students remain less likely to have positive aspirations for attending college upon entering high school (Terenzini et al., 2018). These lower aspirations contribute to gaps in academic achievement and college enrollment outcomes which impact overall income and lifetime earnings gaps.

Barriers to College Enrollment for First-Generation College Students

Increasing college aspirations might be the first step in encouraging students to prioritize high school coursework and learning, but there has been much research to show that FGCs are less likely to enroll in courses that prepares them for the academic rigor of four-year colleges (Cataldi et al, 2018; Warburton et al., 2001). In a literature review about curricular differentiation along educational pathways, Kurlaender & Hibel (2018) note that access to college preparatory courses in high school exposes students to more rigorous topics which makes the transition to college-level coursework easier; introduces a college-going culture to the school and peer group; and can show college admission officers that the student is ready for an academically rigorous curriculum. A first obstacle FGCs encounter is lack of college preparatory or advanced courses offered at the high schools they attend (McDonough, 1997; Perna, 2000). FGCs are more likely to attend schools in low-income communities that offer remedial coursework. For those who do attend schools that offer college preparatory courses, they are less likely than their non-FGC peers to enroll (Warburton et al., 2001). This disparity in enrollment between FGCs and non-FGCs could be attributed to lack of guidance in course selection as well as lack of self-efficacy in believing they can successfully complete college preparatory coursework. Support from an

intermediary at the high school level in course selection and academic preparation might encourage FGCs to enroll and maintain success in academically rigorous high school coursework.

Though some FGCs may aspire to attend college and enroll in a high school curriculum that prepares them for a four-year institution, they may also lack the parental guidance and support that their non-FGC peers have in completing the complex and nuanced college admission and enrollment processes. Research by Smith et al. (2013) found that FGCs are more likely to undermatch in their college selection compared to their non-FGC counterparts. Undermatching occurs when a student's academic achievement permits them to enroll at a postsecondary institution that is more selective than their chosen institution. Lack of knowledge about the variety of college options – including type, location, and financial aid offered – may limit the types of colleges that FGCs consider applying to. Additionally, the complexity of the college admission process may impact the admission rates of FGCs. Research has shown that the complexity of the college admission process ultimately means that students from underrepresented backgrounds fail to complete the application and financial aid processes or they complete them in a haphazard manner that does not result in admission (Avery & Kane, 2004; Klasik, 2011). FGC students need additional support and guidance through the college search, admission, and enrollment processes to be sure that they are well-informed about college options and how to successfully navigate the admission and financial aid processes.

College Counseling Support

Each of these steps in the college-going process for FGCs – college aspirations, preparedness, and enrollment – could benefit from the introduction of an intermediary at the high school level who could step in to encourage students and provide resources to prepare for

postsecondary education opportunities. A vast amount of research has been conducted that emphasizes the key role that high school counselors have on the college outcomes of their students (Engberg & Wolniak, 2010; Farmer-Hinton, 2008; Griffin & Allen, 2006; Holland & Farmer-Hinton, 2009; Hurwitz & Howell, 2014; McDonough, 1997; Stanton-Salazar, 1997). Counselors are able to encourage a college-going culture for the students at their high schools. While providing students with access to resources is essential to guiding students through the college application process, a college-going culture within the school community is necessary for students to be motivated to access the resources offered. A college counseling curriculum is most successful when counselors begin working with students on their college search processes in the ninth grade (McDonough, 1997). Research by Eccles, Vida, and Barber (2004) underscores the importance of creating a college-going culture within communities early in order to boost college enrollment. However, with high counselor-to-student caseloads and low budgets for counseling at U.S. high schools, specifically for college counseling, many students are not receiving the guidance they need through the college selection process by their counseling departments.

Counselors today are tasked with scheduling classes, mental health counseling, adjudicating disciplinary incidents, standardized test administration, and college and career readiness. Juggling so many different responsibilities can be overwhelming, confusing, and time-consuming for counselors. The increasing list of responsibilities ultimately impacts counselors' abilities to adequately prepare students for the college application process (Belasco, 2013; McKillip, Rawls, & Barry, 2012). Hiring more counseling staff and increasing college counseling resources positively impacts college-going rates of all students (Hurwitz & Howell, 2014). A lower student-to-counselor ratio allows students more opportunities for one-on-one support during the college search and application process and students from low-income backgrounds who visit counselors for college planning are more likely to enroll in college (Belasco, 2013). As counselors see increased demands for

their time and expertise, less time is being devoted to college counseling within the high school settling, but this is especially true in disadvantaged communities and schools (Belasco, 2013). These communities are where first-generation college students often need the most support and guidance.

While overall the literature shows that counselors positively influence college-going rates of high school students, there are some challenges that researchers have identified. As mentioned previously, counselors not only guide students through the college application process, they also counsel students on the types of courses they need to take during high school to be academically prepared for four-year institutions. Counselors and teachers are often the most influential factors in high school course selection. In the U.S. public education system, a student's ability to enroll in college prep coursework is directly related to tracking in schools and high school counselors usually determine which "track" a student will be placed into (Griffin & Allen, 2006). Archbald et al (2009) defines tracking as using "prior academic achievement" (p. 67) to determine current educational coursework and states that about 80% of U.S. high schools use some form of tracking. Unfortunately, biases in course tracking among high school counselors may be causing students from underrepresented populations to be tracked into less advanced curricula which limits their preparation for college coursework (Chambers, 2009; Oakes & Guiton, 1995).

Counselors' perceptions of students' abilities and how those perceptions translate into tracking is essential to understanding whether all students truly have equal opportunity for academic success. Once students are placed into a specific course track, it can be challenging to move into a more rigorous track. Teachers are often reluctant to move students from lower to more advanced coursers (Oakes & Guiton, 1995). Therefore, a student who did not apply herself in middle school, but decides to commit to academics in high school, still may not be able to

access a more rigorous curriculum due to early tracking. Ultimately, students begin to fall further behind, and it becomes increasingly difficult to catch up.

There is also some research to show that variations in counselor background, compared to backgrounds of their students, may produce fewer positive results. There is data to suggest that students see more positive college-going outcomes when consulting with counselors from similar racial or ethnic backgrounds (Bryan et al., 2011). Counselors from similar backgrounds are able to better identify with their students and perhaps make more meaningful insights and suggestions about how to increase college aspirations, course enrollment, and highly selective college applications. On the other hand, counselors with less in common may be less likely to positively engage with their students or high beliefs that the students can excel academically at a more selective institution. This lack of confidence in students by counselors ultimately leads to FGCs not building their own self-efficacy to excel in school and apply to highly selective institutions.

Despite these challenges, Xing & Rojewski (2020) found that support from school counselors was especially beneficial for FGCs. FGC students overwhelmingly tend to be low-income; Hispanic, and/or African American; and attend high schools where counseling offices have larger caseloads, more competing demands for time, and lower budgets which leaves students without support they need to navigate the daunting college search and application process (Belasco, 2013; Klasik, 2011; McKillip et al., 2012; Roderick et al., 2011). Xing & Rojewski's research suggests that first-generation students are most likely to benefit from a college counseling curriculum offered at their high schools. However, based on previous findings (Bryant & Nicolas, 2011) we can also hypothesize that non-FGCs are more likely to take advantage of college counseling support during high school due to their higher levels of social and cultural capital. Schools offering college counseling support benefit all students, but

can only benefit those students who access the resources. If FGCs are not accessing college counseling support at the same rates as their non-FGC peers, we're not likely to see improvement in achievement gaps between FGCs and non-FGCs. While previous studies have examined the impact of counseling on college enrollment outcomes, there has been less specific research on the impact of college counseling for FGC student college aspirations, preparedness, and enrollment outcomes.

Social and Cultural Capitals

Non-FGCs are at a significant advantage in the college search and application process because parents can provide their students with the knowledge, resources, and skills to navigate it. Beattie (2018) notes that cultural capital theory, a key sociological theory guiding FGC research, posits that parents with a college education can pass their knowledge and resources down to their children to ensure they receive the necessary educational and networking opportunities to be successful. Students' cultural capital forms their *habitus* which are preferences, perspectives, tastes, and styles that each student brings with them that will either assist or hinder their success (Beattie, 2018; Bourdieu, 1986; McDonough, 1997).

Several prominent educational researchers also reference Bourdieu's (1986) theory of *social capital* in the discussion of FGC college access (Belasco, 2013; Engberg & Wolniak, 2010; Glass, 2022; Holland & Farmer-Hinton, 2009; Robinson & Roksa, 2016). Social capital are the resources one acquires through networks and relationships. Lucas' (2001) theory of effectively maintained inequality argues that socioeconomically advantaged parents use higher social capital and resources at their disposal to ensure advanced educational opportunities for their children. These resources often come in the form of access to schools that offer a college-going culture, college prep coursework, lower student-to-teacher ratios, academic support and

test preparation resources, and opportunities to meet with guidance and college counselors (Klopfenstein, 2004; McDonough, 1997; Moore & Slate, 2008). Non-FGC students often gain social capital from family members while FGCs must seek out social capital from other sources.

Sewell and Hauser (1980) propose through their Wisconsin social-psychological model of status attainment that the ability to rely on social capital from high school staff as *influential others* allows FGCs to improve academic achievement and postsecondary outcomes (Oymac & Hudson, 2018; Robinson & Roksa, 2016; Wilbur & Roscigno, 2016). Stanton-Salazar (1997) refers to these influential others as *institutional agents* who able to use their networks of resources to advance the postsecondary outcomes of students who might otherwise lack the social capital necessary to navigate the college search and application process.

College Pathway Models

College pathways of high school students have been theorized by many scholars (Hirschman, 2016; Hossler & Gallagher, 1987; Perna, 2006; Toutkoushian & Paulsen, 2016). Most college pathways models and frameworks are based on a combination of sociological and economic theories. From sociological perspectives, college aspirations, preparation, and enrollment are influenced by a variety of social and cultural factors, including family income, parent education level, learning opportunities, and influential others who can assist in the college transition process (Belasco, 2013; Bryan et al., 2011; Engberg & Wolniak, 2010; Glass, 2022; Robinson & Roksa, 2016; Wilbur & Roscigno, 2016). From an economics theoretical lens, human capital theory views postsecondary education as an investment, as one forgoes immediate economic returns and incurs costs to earn more in the long-term (Jez, 2014) . Entering high school with the understanding of the economic realities of their families, FGCs may be more

likely to have lower college aspirations. Additionally, FGCs may not be fully aware of how various colleges can impact economic returns on a college degree.

The Hossler & Gallagher Three-Phase College Choice framework (1987) is a prominent conceptual model for investigating the pathway to postsecondary education. The Hossler & Gallagher framework outlines a process by which students move through three distinct stages of college choice - predisposition, search, and choice - as they navigate their postsecondary plans. In the predisposition phase, students determine whether they desire to attend college after high school. The broadness of this phase introduces an important gap in understanding student college choice in that it does not differentiate between students' desires to attend college and whether they have the self-efficacy to believe they will attend college after high school. Students' belief in their ability to be admitted to and enroll in postsecondary education is an essential step in students' college search and preparation process. The second and third phases of the Hossler & Gallagher (1987) framework are college search and college choice, respectively. During the search phase, students gather information about colleges they hope to attend and subsequently move into the choice phase where students ultimately select their college destination. While the Hossler & Gallagher framework is useful for understanding multiple key stages of college transitions among high school students, it has several key limitations. The last two phases of the Hossler & Gallagher framework ignore significant contextual factors related to the college choice process. First, though a student might desire to attend a specific institution after researching, they may not have the academic preparation to be admissible to their most sought-after institutions. Additionally, many students lack the social and cultural capital needed to navigate complicated college admission processes.

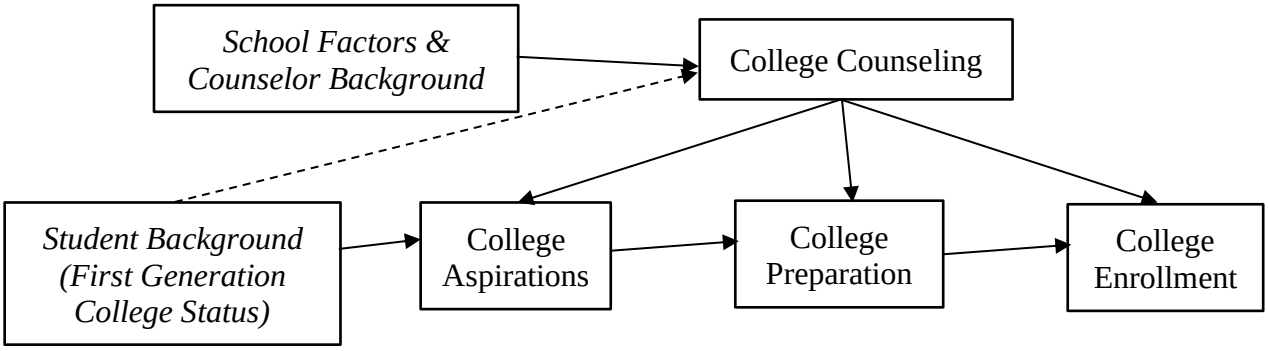
Hirschman's College Pathways Model (2016) outlines a more comprehensive framework for the college search and enrollment process that considers additional stages of development experienced by high school students. Hirschman's model outlines five steps to college access and success: (1) college aspirations, (2) college expectations, (3) college preparation, (4) college enrollment, and (5) college completion. Hirschman's model acknowledges the essential step of college preparation and the need for students to have access to college prep coursework in order to be fully prepared for postsecondary education. Though Hirschman's model includes additional stages of development left out of the Hossler & Gallagher model, it does not consider the importance *of institutional others* in influencing college enrollment outcomes. Additionally, though both models touch on key stages in the development of college choice, both are broad frameworks that are meant to help us understand college pathways of all students. Neither framework acknowledges that college pathways may look different among different demographic groups and specifically for FGCs.

A Framework for Counseling Support in First-Generation Students' College Pathways

Building on and extending the existing relevant literature, this dissertation proposes a new framework for understanding the college pathways of FGC students that includes college aspirations, preparation, and enrollment as stages of development, and also highlights the role that high school counselors play in the formation of these stages (Figure 1). Research by Choy et al. (2000) suggests that college enrollment outcomes can be positively impacted by "encouraging students to aspire to a college degree and helping them prepare academically" (p. 51). Their research also suggests that counselors can assist in guiding FGCs through the high school course selection and college application processes. Considering this, the proposed conceptual framework focuses on three phases of development in the college pathway.

Figure 1

College Counseling Support on College Pathway of FGC Students: A Conceptual Framework



College aspirations, defined as the desire to attend college after high school (Hirschman, 2016), are largely shaped by family background and heavily influence students' college enrollment outcomes. This framework considers that students' demographic backgrounds and habitus impact their postsecondary aspirations upon entering high school. FGCs may enter high school with lower college aspirations than their non-FGC peers. However, college counselors can serve as influential others to increase the college aspirations of FGCs through encouragement, college advising, and implementing a college-going culture at the school level.

College aspirations shape high school course-taking decisions and academic preparation. If counselors can work to increase the college aspirations of FGCs, those students may have increased desire to enroll in a college preparatory curriculum. However, FGCs may still lack knowledge about course options at their high schools. Specifically, they may not be aware of the types of academically rigorous courses four-year colleges and universities require students to take during high school that will prepare them for academic success. College counselors can assist at this stage of the framework by clarifying course options and college requirements for

FGCs; guiding students to enroll in academically rigorous, college preparatory coursework; and ensuring academic success.

Both aspirations and preparation impact ultimate college enrollment outcomes. FGCs both have to aspire to attend college and take college preparatory courses in high school in order to be eligible for admission. As explained above, college counselors can help to increase FGCs' college aspirations and preparation in early high school years by creating a college-going culture. However, counselors can also help in the college-going process in later high school years. During senior year students are busy navigating the college search, application, and enrollment processes. FGCs might lack knowledge about the variety of colleges available to them and may be misinformed about college admission requirements. This leads to increased undermatching of FGCs (Smith et al., 2013). College counselors can play a role at this stage of the framework by providing valuable college information; assisting students in the college application and financial aid processes; and ensuring that students take the necessary steps to matriculate at their chosen college after admission.

At the each of these phases of development college counselors can act as intermediaries and contribute to increasing students' social and cultural capital. However, it is important to note that the type of college counseling a student has access to is influenced by both school factors and the counselor's own background and habitus. School location, type, and student body makeup can impact the availability of college counseling personnel and resources. Students from well-resourced, suburban high schools may be more likely to have access to college counseling support. Additionally, counselors' own background factors and biases may impact the level and type of support that counselors provide their students (Chambers, 2009; Oakes & Guiton, 1995). Thus, it is important to incorporate school and counselor background factors into the framework.

This conceptual framework and its incorporation of college counseling into the college aspirations, preparation, and enrollment stages of FGCs' college pathways guides the three studies presented in this dissertation.

Purpose of the Studies and Importance

Each of the studies in this dissertation have both practice and policy implications. College counseling resources in U.S. high schools are severely underfunded and though the American School Counselor Association (2022) recommends a student-to-counselor ratio of 250-to-1, the national average is actually 415:1. Some states, such as Arizona, Illinois, and Michigan, have counselor caseloads of over 600 students. The results of these studies could shed light on the impact of school counselors on college enrollment outcomes and influence how state education departments and school districts disburse funds to counseling departments, particularly in the most vulnerable communities. Study results could also provide insight at the college level as to whether highly selective four-year institutions are truly accessible to all students regardless of family background or socioeconomic status.

Organization of the Dissertation

The first chapter of this dissertation introduces the topic and provided an overview of the relevant literature related to FGC college enrollment outcomes and the benefits and challenges of college counseling support at U.S. high schools. In Chapter 1, I introduced a theoretical framework for how FGC students navigate the college search, preparation, and enrollment phases of college choice. Chapter 1 provides an overview of the data and key variables used for the studies presented in this dissertation. The next three chapters of the dissertation detail each of the three studies and associated research questions that examine the phases of each stage of the theoretical framework. Each chapter provides a deeper examination of the literature relevant to

the study, describes specific methodology employed for analysis, presents results of the analyses, and discusses significant results. The final chapter summarizes significant results of all three studies and discusses implications for policy, practice, and future areas of research.

Overview of Dissertation Data

Data and Sample

The data used for the analyses in these studies are from the High School Longitudinal Study of 2009 (HSLS:09), conducted by the National Center for Education Statistics (NCES). The HSLS:09 is a nationally representative, longitudinal study that began surveying high school 9th-graders in fall 2009 and followed-up with three subsequent surveys in 2012, 2013, and 2016. Students were asked in detail about their postsecondary plans, high course enrollment plans and decisions, and their postsecondary outcomes. Student respondents also took math standardized assessments in both 9th and 11th grades to identify growth in their math ability. In addition to surveying student respondents, HSLS:09 collected high school transcript data and administered surveys for parents/guardians, school administrators, counselors, and teachers. These additional survey instruments provided context surrounding family background, school demographics and culture, academic offerings, and counseling support.

The HSLS:09 used a two-stage process to survey 9th-grade students in the 2009 base-year survey. The HSLS:09 first used a stratified random sampling to identify 1,890 U.S. schools of which 940 chose to participate in the study. The second stage randomly sampled 9th-grade students from school enrollment lists – 23,500 students were deemed eligible to participate. 21,440 students completed the base-year survey (2009). HSLS:09 conducted three follow-up surveys in spring of 11th-grade (2012), high school graduation year (2013), and postsecondary outcomes (2016). This dissertation uses data from the student, parent/guardian, administrator,

and counselor base-year surveys (2009); 2012, 2013, and 2016 follow-up surveys; and the 9th-grade math assessment. Additional information on survey design and procedures can be found in the Base-Year Data File Documentation (Ingels et al., 2011). This dissertation focuses only on HSLS:09 respondents who were first-time 9th graders in 2009 (Table 1), excluding students who were repeating 9th grade in 2009. Additional sample restrictions for each study will be detailed in subsequent chapters. To limit the risk of disclosure of personally identifiable information, all unweighted sample sizes have been rounded to the nearest 10.

Table 1

Selection Criteria of Analytic Sample

Selection Criteria	*N*
Number of total students available in HSLS:09	23,500
Number of students who participated in the base-year survey	21,440
Number of students who were first-time 9th graders in 2009	20,180

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Variables

Table 2 outlines the key variables used in this dissertation. Independent, dependent, and control variables for each study will be detailed in the related chapter of the dissertation. Appendix A lists and defines all key variables used in this dissertation.

Table 2

Dependent, Independent, and Control Variables

	Study 1 – College Aspirations	Study 2 – College Preparation	Study 3 – College Enrollment (Undermatching)
Dependent Variables	College Aspirations College Enrollment Status	College Prep Course Enrollment College Enrollment Status	College Enrollment Selectivity

Independent Variables	Initial College Aspirations College Counseling Support	College Prep Course Offerings College Counseling Support	College Counseling Support
Moderator	First-Generation College (FGC) Status		
Control Variables	Student Demographics (i.e., Sex, Race/Ethnicity, Socioeconomic Status), Academic Ability, Self-Efficacy, Parent's Educational Expectations, School Characteristics (i.e., School Sector, Location), Counselor Background		
Additional Control Variables		Initial College Aspirations	Initial College Aspirations College Prep Course Offerings

CHAPTER 2

Study I: Disparities in College Counseling Support, Aspirations, and Enrollment of First-Generation College Students

College enrollment and completion begins with middle and high school student college aspirations. Low college aspirations during high school are associated with being less likely to apply, enroll, and complete a bachelor's degree. Students who aspired to attend college in 10th grade were 2.58 times more likely to enroll in college initially after high school than those with lower college aspirations in early high school (Poynton & Lapan, 2017). Students' college aspirations may be influenced by various individual and school factors including family background, high school culture, and peer influence. If a student comes from a family where neither parent completed college, it is possible that attending college isn't regularly discussed in the home and, consequently, the student who is first-generation college (FGC) bound would never considers college as a postsecondary option. That same student who attends a high school in a low-income, urban, or rural community, might also lack the resources at school and peer influence to encourage him/her to consider attending college.

From the perspectives of the Wisconsin model of status attainment and social capital (Stanton-Salazar, 1997; Sewell & Hauser, 1980), FGC students would benefit from having an *influential other* to help increase their college aspirations while in high school. Research has shown that college counselors can play a role in increasing college enrollment outcomes of high school students (Adelman, 2006; Pham & Kennan, 2011; Plank & Jordan, 2001). College counselors use their connections and knowledge to introduce students to college representatives and guide students through the application and financial aid processes. Counseling departments that can focus their attention on postsecondary education preparation might see higher college

aspirations and enrollment outcomes. This study seeks to add to the literature by specifically understanding how these types of college counseling resources and supports influence the college aspirations of FGC students and postsecondary enrollment outcomes.

Prior Evidence on College Aspirations of First-Generation College Students

Students enter high school with various aspirations for postsecondary options. Based on family background (i.e., parental education level and socioeconomic status) students may be encouraged from birth to pursue postsecondary education. Researchers found that high school students generally have positive aspirations about enrolling in college though there are marked differences in gender (women more likely to aspire to college than men) and race/ethnicity (Hirschman, 2016). American Indian, Pacific Islander, and Mexican American students are less likely to aspire to college than White, Black, and Asian students.

Choy's (2001) nationally representative research from a cohort of 1992 high school graduates found that in 8th grade, 55% of FGCs aspired to attend college compared to 71% of non-FGCs. More recent research found that college aspirations of all students have increased over time (Poynton & Lapan, 2017; Schneider & Saw, 2016), however FGC college aspirations and enrollment still do not meet the same levels of their non-FGC counterparts (Redford & Mulvaney Hoyer, 2017). There could be several reasons related to family background and school context to explain why FGCs have lower college aspirations in early high school, including differences in family conversation about college and lack of encouragement at the school and from peers to go to college. FGCs do not have the same types of college-going conversations in their households as their non-FGC peers. Additionally, FGCs are less likely to attend high schools with a college-going culture.

Family Context of First-Generation College Students

Aspirations for attending college often start in the home environment. When parents begin speaking to their children earlier about postsecondary education options, students adopt an early mindset that assumes they will naturally enroll in college after high school. Students whose parents earned bachelors' degrees indicate that the idea of not going to college never occurs to them because conversations about college-going occur regularly in their homes and among their peers (McDonough, 1997). For these students, enrolling in college after high school is a normalized practice and ingrained in their postsecondary plans from an early age. By contrast, FGC students may lack everyday discussion about postsecondary education or be discouraged from pursuing college in lieu of immediately earning an income.

Coleman (1988) combines human capital theory with social capital in the context of education to posit that students and parents consider the capital invested in postsecondary education in relation to their return on investment (Klasik, 2011). FGC families might be less interested in encouraging their students to pursue postsecondary education because of immediate financial needs of the family. Some FGC families may highly value education but lack the social capital to have meaningful conversations that can guide their students on a path towards postsecondary education. This then plays into the *habitus* and postsecondary aspirations of the student when they enter high school. These students can benefit from an additional source of encouragement and guidance on their educational path that introduces the concept of four-year colleges early on. Early intervention by college counselors as *influential others* for FGC students might positively impact their college aspirations (and college enrollment outcomes) by encouraging students who might have otherwise foregone postsecondary education to consider it as an option.

College Counselor Role in Shaping College Aspirations of First-Generation College Students

College counselors highly influence the college-going culture at their high school by shaping students' college expectations and providing both individual and peer-group encouragement about the college-going process (Holland & Farmer-Hinton, 2009). For FGCs, who lack the college knowledge and conversations at home to consider postsecondary institutions, college counselors serve as *influential others* who can help to introduce college-going concepts to FGCs in the early high school years and inspire the confidence to consider four-year colleges and universities. Research to date, however, has not systematically examined the potential disparities in access to college counseling supports among FGC students who tend to come from low-income households and attend low-resourced schools.

While several empirical studies have found that college counseling resources increase college aspirations and enrollment among high school students (Adelman, 2006; McDonough, 1997; Plank & Jordan, 2001), fewer have focused specifically on the aspirations of FGCs (Pham & Keenan, 2011). Though Pham & Keenan (2011) have studied the college aspirations of FGCs, their research was conducted using a dataset that focused on the percentage FGC students at the school level instead and overall college enrollment outcomes instead of centering individual students in the research. Additionally, the Pham & Keenan (2011) sample was collected from one urban district and has limited generalizability.

Individual and Contextual Predictors of College Aspirations and Enrollment

In addition to college counseling support, there are several individual and school-level factors that influence college aspirations and enrollment of high school students. Student demographics differences have been shown to be predictors of postsecondary outcomes (Baker et

al, 2018; Engberg & Wolniak, 2001; Perna & Titus, 2005; Warburton, 2001). The research has found key differences in students by race, sex, income, and first-generation college status in terms of college aspirations, academic preparation, and enrollment. Research has shown that the most influential figure in shaping postsecondary plans is consistently the parents (Eccles et al., 2004; Engberg & Wolniak, 2001). Parents can shape postsecondary aspirations from the time of early childhood and continue to do so during high school. Parent's educational expectations are used as controls in this study because students who have parents with high college expectations are more likely to enroll in college.

Additionally, students' own perceptions that they will succeed is an important predictor of achievement and college persistence. Bandura (1997) defines self-efficacy as "a belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). For students to aspire to attend highly selective institutions, they must first believe that they are able to achieve academically. Students must believe that they can enroll in college and ultimately earn a bachelor's degree after high school. Students who are succeeding academically are more likely to want to pursue postsecondary education options. High school academic achievement is one of the strongest predictors of college academic success (Adelman, 2006; Trusty, 2004). Math ability is used as a control variable in this study because has been shown to be a particularly strong predictor of academic achievement. Researchers found that students with more advanced math courses were more likely to pursue postsecondary education (Belasco, 2013; Engberg & Wolniak, 2010; Perna, 2000).

At the school level, studies have shown differences in college enrollment outcomes by school type – public versus private (Coleman, 1981; Engberg & Wolniak, 2010). Results of these studies saw higher college enrollment rates for students who attended private schools compared

to their public-school counterparts. Additionally, whether a school is located in a rural, suburban, or urban community often impacts the type of courses and college enrollment support offered at the school. Students from suburban or urban high schools are more likely to have access to college preparatory coursework compared to students from rural areas or towns (Burns & Leu, 2019). Within school contexts, the student body composition, peer-influence, and college-going culture also inform college aspirations and enrollment.

Finally, peer influence is an important factor when considering college-going cultures in high schools. When students are surrounded by other highly motivated and high achieving students, they are more likely to achieve and pursue postsecondary opportunities (McDonough, 1997). Research has shown that there are achievement differences among racial/ethnic and socioeconomic groups (Perna, 2000; National Center for Education Statistics, 2022; Schneider & Saw, 2016) with White and Asian students having higher college-going rates than their Black, Latinx, and Native American peers. All of these factors are important predictors to consider to better understand how college counseling support relates to college aspirations of FGCs.

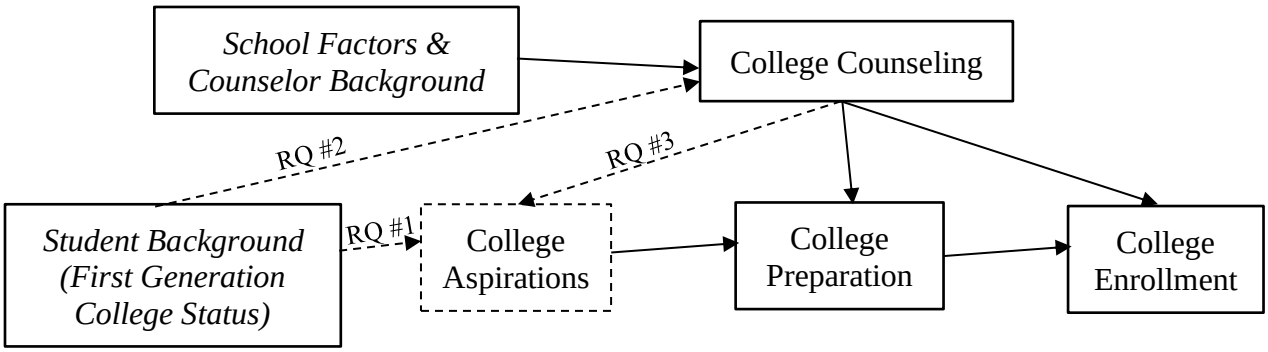
This study aims to fill the research gaps surrounding the unequal access to college counseling supports by college generation status and its impacts on FGC student college aspirations. Figure 2 illustrates how this study relates to the overall conceptual framework guiding this dissertation. The aim of this study is addressed by three specific research questions:

1) Whether and to what extent do college aspirations and enrollment of FGC students differ from their non-FGC peers over time in high school?
2) Whether and to what extent does access to various college counseling supports vary by college generation status?

3) Whether and to what extent do various college counseling resources relate to educational aspirations and college enrollment outcomes for FGC students?

Figure 2

College Counseling Support on College Pathway of FGC Students: A Conceptual Framework



Methods

Data & Sample

As outlined in Chapter 1, this study used the HSLS:09 a nationally representative, longitudinal dataset. Though over 21,000 students were surveyed for the HSLS:09, this study only focused on those students who submitted the base-year survey (2009) and were first-time 9th graders in 2009 (n = 20,180). In this study, the analytic sample was further limited to include only students who participated in the first follow-up (2012) survey whose information on college aspirations in late 11th grade is available (n = 17,730). To limit the risk of disclosure of personally identifiable information, all unweighted sample sizes have been rounded to the nearest 10.

Measures

The independent variables for this study related to students' access to college counseling resources and support. The dependent variables focused on 11th-grade college aspirations and

students' four-year college enrollment status (as of about two years after high school). Control variables for this study are student backgrounds, school factors, and counselor characteristics.

Independent Variables: College Counselling Supports

The primary independent variables for this study were the college counseling supports available to the students at their high schools. The head counselor at each school completed a base-year survey (2009) which asked about the schools' counseling resources and support.

Counselor Caseload

In the base-year counselor survey (2009), the head counselor was asked "On average, what is the caseload for a counselor in this school?" Respondents submitted free-text numeric responses. This variable was recorded as a continuous variable in the HSLS:09 dataset with values between 2-999.

Dedicated College Counselor

Counselor respondents were asked whether the school employed "…one or more counselors whose primary responsibility is…assisting students with college readiness, selection, and applications?" Response values were 1) yes and 2) no. This variable was recoded into a binary variable for all those who responded "yes."

College Prep Counseling Goal

Counselor respondents were asked to identify the goal the "school's counseling program emphasizes the most." Response values included: 1) helping students plan and prepare for their work roles after high school; 2) helping students with personal growth and development; 3) helping students plan and prepare for postsecondary schooling; and 4) helping students improve their achievement in high school. The "helping students plan and prepare for postsecondary schooling" response was recoded into a binary (yes/no) variable.

College Prep Counseling Time

Counselor respondents were asked what percentage of work hours counseling staff spent during the 2008-2009 academic year on "assisting students with college readiness, selection, and applications." Response values were: 1) 5% or less; 2) 6%-10%; 3) 11%-20%; 4) 21%-50%; and 5) More than 50%. An analysis of the responses to this question showed that 47.2% of counselors reported that their staff spend 20% or less of their time on college counseling. Responses of "21%-50%" and "More than 50%" were combined and recoded to become a new binary variable identifying schools where counselors spend more than 20% of their time on focused on college counseling.

Postsecondary Plan Required

Counselor respondents were asked if students at the high school were "required to have a career or education plan?" Response values included: 1) Yes, a combined career and education plan; 2) Yes, a career plan only; 3) Yes, an education plan; or 4) Neither a career plan nor an education plan. The combined, career, and education plan responses were recoded into a binary variable to identify schools where students were required to have either a career and/or education plan.

College-Going Resources

Counselor respondents were asked if the school facilitates the college transition of high school students by offering the following college-going resources or programs:

1) Holds or participates in college fairs
2) Consults with postsecondary school representatives about requirements and qualifications sought
3) Organizes student visits to colleges

4) Enrolls students in special programs that help them plan or prepare for college, such as Upward Bound, GEAR UP, AVID, or MESA
5) Holds information sessions for students and parents or guardians
6) Assists students with finding financial aid for college
7) Offers a counseling curriculum that leads to positive academic behaviors
8) Your school takes other steps

Respondents could check all response values that applied to their school. Affirmative responses to each of these options were recoded into binary variables to identify whether students were offered these resources at their schools.

Dependent Variables: College Aspirations and Enrollment

Two outcome variables were examined to address the research questions of this study: 11th-grade college aspirations (as of 2012) and four-year college enrollment status (as of 2016).

11th Grade College Aspirations

Students described their college aspirations in late 11th-grade. In the first follow-up study, students were asked "As things stand now, how far in school do you think you will get?" Response values allowed students to select: less than high school; high school diploma or GED; start or complete an Associate's/Bachelor's/Master's/Ph.D or professional degree; or, don't know. This variable was recoded into binary categories of low college expectations (e.g., earning less than a high school diploma, a high school diploma/GED, Associate's degree, or don't know) and high college expectations (e.g., earning a Bachelor's, Master's, Doctorate, or other advanced degree). The analyses used the generated binary "high college expectations" variable.

Four-Year College Enrollment Status

In the second follow-up survey (2016) students were asked about their postsecondary institution enrollment. Students were asked their college enrollment status (or most recent undergraduate enrollment status) as of February 2016. Each student was then assigned an institutional reference level for the most recent institution, undergraduate degree, or certificate program attended as of February 2016. Institutional reference levels were categorized as 1) 4-year; 2) 2-year; and 3) less than 2-year. Students who indicated that they did not enroll in postsecondary education were categorized as "Item legitimate skip/NA." Categories for non-response and missing values were also presented. For this analysis, a binary variable for four-year college enrollment level was created. Response values for skipped, non-responses, and missing were also recoded and excluded from the analysis.

Control Variables

Sex

Sex is a dichotomous variable. Respondents could select either male or female. A binary variable for "female" was recoded to use as a control variable with males as the reference group.

Race/Ethnicity Composite

Race/Ethnicity was asked as a three-part question with three dichotomous variables. Students were first asked in the base-year survey (2009) about Latinx heritage, followed by racial identity and, finally, Asian heritage. The composite race variable is derived from the dichotomous race variables in the students' base-year survey (2009). For this analysis, binary categories for White, Asian, Black, Hispanic, Multi Race, and Other Race were created to use as control variables with White as the reference group.

Socioeconomic status (SES)

SES is a composite variable calculated by the NCES using the student's parent(s)/guardian(s) education level, occupation, and family income. Each of these values were recorded via questions asked in the base-year parent survey (2009). SES is presented as standardized continuous variable in HSLS:09.

First-Generation College Status

This variable was recorded as the highest level of education received by either parent living in the student's home. The parent's education HSLS:09 variable is constructed from two composite variables based on each parent respondent's highest level of education. This variable was recoded into binary categories of "FGC-Yes" (e.g., less than a high school diploma, a high school diploma/GED, or Associate's degree) and "FGC-No" (e.g., Bachelor's, Master's, Doctorate, or other advanced degree) based on the highest level of education received by either parent.

9th Grade College Aspirations

Students were asked about their college aspirations in the base-year (2009) survey: "As things stand now, how far in school do you think you will get?" Response values allowed students to select: less than high school; high school diploma or GED; start or complete an Associate's/Bachelor's/Master's/Ph.D or professional degree; or, don't know. This variable was recoded into binary categories of low college expectations (e.g., earning less than a high school diploma, a high school diploma/GED, Associate's degree, or don't know) and high college expectations (e.g., earning a Bachelor's, Master's, Doctorate, or other advanced degree). The analyses used the generated binary "high college expectations" variable.

Parent's Educational Expectations

In the base-year parent survey (2009), respondents were asked "as things stand now, how far in school do you think [he/she] will actually get?" Response values allowed respondents to select: less than high school; high school diploma or GED; start or complete an Associate's/Bachelor's/Master's/Ph.D or professional degree; or don't know. This variable was recoded into binary categories of low parent educational expectations (e.g., earning less than a high school diploma, a high school diploma/GED, Associate's degree, or don't know) and high parent educational expectations (e.g., earning a Bachelor's, Master's, Doctorate, or other advanced degree). The analyses used the generated binary "high college expectations" variable.

9th Grade Academic Achievement

The Theta (ability) score estimate from the 9th-grade math assessment was used in this study to identify math achievement. The theta score was used instead of estimated number right or T-scores because the Theta is more useful for correlation analysis with demographic variables and to measure math achievement overtime with longitudinal data.

Confidence to Earn Bachelor's

Student respondents were asked in the base-year survey (2009) whether they felt they were capable of earning a Bachelor's degree. Response values included: 1) Definitely, 2) Probably, 3) Probably not, and 4) Definitely not. This response was used for the study instead of the question asking whether students are sure they will earn a bachelor's degree because it was asked of all students regardless of educational expectations. This variable was recoded to generate a new binary variable for those who believe they have the ability to complete a Bachelor's degree ("definitely" and "probably" response options).

Postsecondary Plans

In the base-year survey (2009), student respondents were asked how sure they were that they would enroll in college immediately after high school. Response values were: 1) Very sure you'll go; 2) You'll probably go; 3) You probably won't go; and 4) Very sure you won't go. For this study, the variable was recoded to generate a new binary variable for those who are very or probably sure they will go on to college after high school.

High School Characteristics

School type

School type is a dichotomous variable. Administrator respondents could confirm that the school was either public or private.

School locale

HSLS:09 categorizes the student's base-year school as city, suburban, town, or rural based on the source data used for sampling the schools (Ingels et al., 2011).

Peer Racial/Ethnic Composition

Administrator survey respondents were asked to provide percentage breakdowns of the racial and ethnic makeup of the student body. Responses options were: 1) Hispanic or Latino/Latina; 2) White, non-Hispanic; 3) Black or African American, non-Hispanic; 4) Asian or Pacific Islander; and 5) American Indian or Alaska Native. Each of these values were categorized into separate continuous variables. For this research, I wanted to better understand the peer effect for students with similar academic aspirations and achievement. Students from African American, Native American, and Hispanic background, historically, have similar levels of academic achievement. Additionally, Asian American and White students usually have similar academic achievement and postsecondary outcomes. Thus, this study controls for schools that have a larger number of Asian or White students who have higher academic aspirations and

postsecondary outcomes. A binary variable was generated that categorized whether a school had White student enrollment of more than 40%. A second binary variable was generated that categorized whether the school had Asian enrollment of more than 10%. The reasoning for differences in percentages of Asian and White students was due to the demographic makeup of most U.S. high schools. There are few schools that have more than 40% Asian students. In an effort to generate variables that were comparable in terms of numbers of students, 40% or more White student enrollment was chosen (*n*=18,030*)* or 10% or more Asian student enrollment (*n*=2,100).

Peer Socioeconomic Composition

Administrator respondents were asked what percentage of the student body receives free or reduced-price lunch. Responses to this question were recorded in HSLS:09 as a categorical variable. The percentage of the student body receiving free or reduced-price lunch serves as a proxy for the percentage of students at a school who are low-income. Students who attend schools with higher numbers of low-income peers are less likely to aspire to enroll in postsecondary education. A binary variable was generated that categorized whether a school had free or reduced-price lunch enrollment of more than 40% thereby providing insight into the proportion of low-income students (*n*=8,060).

Percentage of AP Enrolled Students

Administrator respondents were asked" "What percentage of the student body enroll in AP courses either at the high school or off-site?" Responses to this question were recorded in HSLS:09 as a continuous variable. Students whose peers are enrolled in advanced coursework are more likely to have higher postsecondary aspirations. This variable is helpful controlling for

peer-effect as students who attend schools with a high percentage of peers enrolling at four-year institutions might be encouraged to also pursue it.

Four-Year College Enrollment

Administrator respondents were asked "For the following question your answers should sum to 100%. Please round to whole numbers and answer '0' if there are no students in a category. What percentage of last year's 12th-grade class..." Responses required were: 1) went on to 4-year, bachelor's degree-granting colleges?; 2) went on to 2-year, associate's degree-granting colleges or technical institutes?; 3) entered the labor market?; 4) joined the military?; and 5) did something else? Each of these responses were coded as continuous variables. This variable was used to control for peer-effect as students with a high percentage of peers who matriculate at four-year institutions are more likely to aspire to four-year colleges.

Counselor Background

Years of Experience

The base-year counselor survey (2009) asked counselor respondents how many years of experience they had as counselors at the high school level (9-12). This data was recorded as a continuous variable in HSLS:09 and was not recoded for this study.

College Degree

Counselor respondents were asked to provide information on their highest degree earned. Response options included: 1) Associate's degree; 2) Bachelor's degree; 3) Master's degree; 4) Educational specialist diploma; 5) Ph.D., M.D., law degree, or other high level professional degree; or 6) You do not have a degree. This variable was recoded for this study into a binary variable indicting whether the respondent earned a Bachelor's degree or higher.

Characteristics of Study Samples

This study investigated the impact of college counseling support on the educational aspirations and college enrollment outcomes of FGCs. Table 3 presents the descriptive statistics for the study sample. The analytic sample included various levels of missing data by variable and Table 4 details the percentage of missing cases for each variable in the dissertation. To account for missing patterns in control variables, missing indicators were created. For each control variable with missing values, a dummy "missing" variable was created and missing values in the raw variable were recoded as zero. In the statistical analysis, coded control variables and the related missing indicators were included.

The average caseload for a high school counselor at the schools surveyed was 369 and about 52% of schools reported having a counselor dedicated to college counseling on staff. 44% of schools reported college counseling as the number one goal of the counseling department and 40% of schools reported spending more than 20% of counseling time dedicated to college preparation. The schools overwhelmingly offered college preparation resources such as college fairs (83%), hosting college rep visits (86%), and financial aid guidance (86%).

About 75% of high school students enrolled in college immediately after high school with 46% of students enrolling in four-year institutions and 29% of students enrolling in two-year colleges. The population was 51% female, 54% white, 4% Asian, 13% Black, and 21% Hispanic. 49% of students identified as first-generation college students. Key demographic differences between FGCs and non-FGCs are provided in Table 22. As 9th-graders, about 64% of the students aspired to earn at least a bachelor's degree after high school and about 59% of the students' parents expected their students to earn at least a Bachelor's degree.

The students' high school breakdowns were 33% suburban, 31% urban, and 36% rural or town. The high schools were 87% public and 7% private (with 5.6% missing). 40% of students at the high schools were receiving free or reduced lunch. On average, high school counselor respondents had 8 years of experience with an overall range of 0-45 years of experience. Additionally, 89% of counselors reported having a college degree.

Table 3

Study 1 Descriptive Statistics (n = 17,730)

	Mean	S.D.	Minimum	Maximum
College Counseling Support				
Counselor caseload	369.411	135.99	2	999
Dedicated college counselor	.520	.500	0	1
College prep counseling goal	.442	.497	0	1
College prep counseling time	.404	.491	0	1
Postsecondary plan required	.724	.447	0	1
College fairs offered	.830	.375	0	1
College representative visits	.858	.349	0	1
College visits	.612	.487	0	1
College prep program	.459	.498	0	1
Information sessions	.842	.364	0	1
Financial aid	.040	.197	0	1
Counseling curriculum	.593	.491	0	1
College transition	.331	.471	0	1
Postsecondary Outcomes				
Not in school	.258	.438	0	1
2-year college	.286	.452	0	1
4-year college	.455	.498	0	1
11th Grade Aspirations				
High School	.100	.300	0	1
Associate's degree	.163	.369	0	1
Bachelor's degree	.277	.448	0	1
Master's degree	.221	.415	0	1
Ph.D. or professional degree	.137	.344	0	1
Don't know	.102	.303	0	1
Demographics				
Female	.507	.500	0	1
White	.536	.499	0	1
Asian	.036	.187	0	1
Black	.125	.331	0	1

Hispanic	.214	.410	0	1
Multi-race	.077	.267	0	1
Other race	.011	.106	0	1
Socioeconomic status (SES)	-.023	.756	-1.815	2.881
First-generation college (FGC)	.486	.500	0	1
Non-FGC	.315	.465	0	1
FGC missing	.199	.399	0	1
Self-Efficacy				
Confidence to earn bachelor's	.905	.293	0	1
Postsecondary plans	.579	.494	0	1
9th Grade Educational Aspirations				
High school	.129	.335	0	1
Associate's degree	.066	.248	0	1
Bachelor's degree	.173	.379	0	1
Master's degree	.216	.411	0	1
Ph.D. or professional degree	.208	.406	0	1
Don't know	.209	.406	0	1
Parents' Educational Expectations				
High school	.056	.230	0	1
Associate's degree	.068	.252	0	1
Bachelor's degree	.248	.432	0	1
Master's degree	.168	.374	0	1
Ph.D. or professional degree	.175	.380	0	1
Don't know	.086	.281	0	1
High School Characteristics				
School Type				
Public	.871	.335	0	1
Private	.073	.260	0	1
School type missing	.056	.231	0	1
School Locale				
City	.311	.463	0	1
Suburban	.334	.472	0	1
Town	.116	.320	0	1
Rural	.239	.427	0	1
Student Body Composition				
More than 10% Asian	.109	.311	0	1
Less than 40% White	.255	.436	0	1
40-70% White	.227	.419	0	1
70-90% White	.206	.405	0	1
More than 90% White	.235	.424	0	1
% White Missing	.076	.266	0	1
Free/Reduced Lunch	.413	.492	0	1
AP enrollment	14.692	13.674	0	100
Four-year college enrollment	36.759	29.939	0	100
Counselor Characteristics				
Years Experience	8.053	7.534	0	45

College Degree	.893	.309	0	1

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in fall of 2009.

Table 4

Missing and Non-Response Data by Variable (n=25,210)

Variable	% Missing
Student-level	
Sex	0.23%
Race/Ethnicity	7.83%
Parent's Educational Background	32.62%
Socioeconomic Status	0.00%
Academic achievement	14.93%
Parents' educational expectations	28.71%
Confidence to earn B.A.	16.8%
Postsecondary plan	16.5%
School-level	
School type	5.58%
School location	0.00%
% Asian	8.18%
% White	8.02%
% on Free/Reduced Lunch	8.44%
AP enrollment	10.53%
Four-year college enrollment	23.16%
Counselor Background	
Years experience	15.85%
College degree	10.0%
College Counseling Support	
Counselor caseload	9.59%
Dedicated college counselor	10.12%
College prep counseling goal	9.78%
College prep counseling time	10.76%
Postsecondary plan required	9.66%
College fairs offered	9.99%
College representative visits	9.99%
College visits	9.99%
College prep programs	9.99%

Information sessions	9.99%
Financial aid	9.99%
Counseling curriculum	9.99%
College transition	9.99%
College Counseling Support	
11th-grade aspirations	18.30%
Four-year college enrollment	24.97%

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in fall of 2009.

Statistical Analyses

The research questions were empirically tested using multivariate statistical analyses, specifically Linear Probability Models and Linear Regressions. There are multiple justifications for using LPMs in lieu of logit or probit models. The primary advantage of using LPMs is interpretability considering the large sample size provided in HSLS:09. In models with interaction effects among independent variables, logistic regressions can be challenging to interpret. On the other hand, LPM coefficients represent a change in probability of an outcome occurring if the independent variable is adjusted by one unit. Additionally, the research questions for this study compare differences among multiple indicators such as college aspirations over time, first-generation status, and college counseling support. There is an advantage in using LPMs for simplicity in comparing differences across these indicators (Mood, 2010).

Linear Probability Models (LPMs) were employed to test the first research question by quantifying the differences in college aspirations in 9th and 11th grades (binary dependent variables) and four-year college enrollment outcomes (a binary dependent variable) between FGCs and non-FGCs. The LPM is specified as:

College Aspirations (9^{th}/11^{th} grade) = $\beta_0 + \beta_1 FGC + \varepsilon$

Four-Year College Enrollment Outcomes = $\beta_0 + \beta_1 FGC + \varepsilon$

A multiple linear regression (for the continuous dependent variable) and LPMs (for binary dependent variables) were used to address the second research question to quantify differences in access to various college counseling supports for FGCs and non-FGCs. The LPM is specified as:

College Counseling Support = $\beta_0 + \beta_1 FGC + \varepsilon$

Finally, the third research question was addressed using a series of LPMs with the interaction terms of first-generation college status and each of the college counseling support variables separately in order to quantify differential effects of college counseling support on college aspirations and enrollment by college generation status. The regression model is specified as:

$$11th - grade\ college\ aspirations = \beta_0 + \beta_1 FGC + \beta_2 College\ Counseling\ Support + \beta_3 (FGC\ X\ College\ Counseling\ Support) + \beta_s STU + \beta_s SCH + \beta_s CSLR + \varepsilon$$

$$Four - year\ college\ enrollment = \beta_0 + \beta_1 FGC + \beta_2 College\ Counseling\ Support + \beta_3 (FGC\ X\ College\ Counseling\ Support) + \beta_3 STU + \beta_3 SCH + \beta_3 CSLR + \varepsilon$$

College counseling support represents one of 13 college counseling support variables examined in the study. *STU* represents student-level control variables included in the regression model whereas *SCH* represents school-level control variables. *CSLR* represents counselor background variables included in the regression model as controls.

All data was analyzed using STATA statistical software. As this study uses data from school surveys and three student surveys, the W1STUDENT, W2W1STU, and W4W1W2W3STU probability weights (p-weights) were applied. P-weights were included

because the weights are "proportional to the inverse of the probability then an observation is included due to sampling strategy" (Mehmetoglu & Jackson, 2017, p. 332).

Results

Disparities in College Aspirations and Enrollment Outcomes among FGCs and non-FGCs

The first research question examined the college aspirations and enrollment outcomes between FGCs and non-FGCs (Table 5). The analyses examined whether students had high college aspirations, operationalized as a desire to earn a Bachelor's degree or higher after high school. LPMs were run both with and without control variables. Table 5 presents results of LPMs without control variables (unconditional models) to demonstrate the raw population differences between FGC and non-FGC in college aspirations and enrollment without accounting for covariates. However, as FGC and non-FGC have systemactically different demographics (Table 22), Table 24 presents the differences in college aspirations and enrollment levels between FGC and non-FGC student after controlling for key demographic characteristics (conditional models). The LPMs results in Table 5 indicate that in 9th grade, 74.6% of non-FGCs had high college aspirations compared to 53.8% of FGCs (a 20.8-percentage point gap). College aspirations for all students increased between 9th and 11th grades. However, the college aspiration gap between FGC And non-FGC students grew over time. By 11th grade, 81.6% of non-FGCs reported high college aspirations compared to 56.2% of FGCs (a 25.4-percentage point gap).

Overall, a higher percentage of non-FGCs (90.8%) reported enrolling in college after high school compared to FGCs (68.4%). Specifically, 71.7% of non-FGCs reported enrolling in four-year institutions after high school compared to 34.7% of their FGC counterparts (a 37-percentage point gap). Additionally, a smaller percentage of non-FGCs reported enrolling in two-year institutions (19.1% versus 33.7%) or not enrolling in college (9.2% versus 31.6%).

Table 5

Differences in Educational Aspirations and Four-Year College Enrollment by College Generation Status

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Educational Aspirations					
9th grade high aspirations	.746	.006	.538	.008	-.208***
11th grade high aspirations	.816	.007	.562	.008	-.254***
College Enrollment					
Not in school	.092	.007	.316	.009	.224***
2-year college	.191	.007	.337	.009	.146***
4-year college	.717	.007	.347	.009	-.370***

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Disparities in Access to College Counseling Support among FGCs and non-FGCs

Results of the second research question examining the differences in college counseling support between non-FGCs and FGCs are listed in Table 6 and show that FGCs were less likely to attend schools where counselors are able to focus their time and attention on college counseling. Results of the analysis show that non-FGCs attended high schools where counselors have on average 24 fewer students in their caseloads compared to counselors of FGCs. 56.6% of non-FGCs attended high schools where college counseling was the primary counseling goal compared to 45.1% of FGCs (a 11.5-percentage point gap). Additionally, 51.8% of non-FGCs attended a school where counselors spent more than 20% of their time on college counseling compared to 45.2% of FGCs (a 9.3-percentage point gap).

In terms of college preparation resources, FGCs were more likely to attend schools that offered college preparation resources. 73.9% of non-FGCs were required by their schools to have a postsecondary plan compared to 83.1% of FGCs (a 9.2-percentage point gap). Additionally, 38.8% of non-FGCs attended schools that offered college prep programs such as Upward Bound or AVID compared to 56.5% of FGCs (a 17.7-percentage point gap). The results presented in Table 6 are a series of LPMs without control variables. Results of analyses run with control variables are presented in Table 27.

Table 6

Differences in Access to College Counseling Support by College Generation Status

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.	Mean	S.D.	
Counselor caseload	353.046	1.908	376.776	2.441	23.73***
Dedicated college counselor	.599	.007	.573	.009	-.026**
College prep counseling goal	.566	.007	.451	.009	-.115***
College prep counseling time	.518	.007	.452	.009	-.093***
Postsecondary plan required	.739	.006	.831	.007	.092***
College fairs offered	.914	.004	.928	.005	.014**
College representative visits	.952	.003	.953	.004	.001
College visits	.602	.007	.716	.008	.114***
College prep program	.388	.007	.565	.009	.177***
Information sessions	.829	.005	.852	.006	.023***
Financial aid	.061	.003	.037	.004	-.024***
Counseling curriculum	.665	.007	.655	.009	-.010
College transition	.393	.007	.358	.009	-.035***

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Relationship Among College Counseling Support, College Aspirations, and College Enrollment Outcomes for FGCs.

To answer research question 3, LPMs were used to estimate the effect of college counseling support on 11th grade college aspirations and college enrollment outcomes. These analyses accounted for the control variables listed earlier in this chapter. Model 1 explored the effect of college counseling support and FGC status separately on 11th grade college aspirations (Table 7). However, Model 2 tested the interaction of both college counseling support and FGC status on 11th grade college aspirations.

The results of the analyses indicate that FGCs who attended schools where there was a dedicated college counselor were 4.2 percentage points more likely to have high college aspirations in 11th grade compared to FGCs who did not (statistically significant at the critical level of 10%). At schools where counselors spent at least 20% of their time on college counseling, FGCs were 4.8 percentage points more likely to have high college aspirations in 11th grade. However, FGCs who attended schools that helped students find financial assistance for college were 10.6 percentage points less likely to have high college aspirations in 11th grade. When looking at the financial aid variable on its own, it had a positive influence on college aspirations of high school students, but when interacting financial aid with FGC status, it seems to have a negative effect.

Table 7

Differential Effects of College Counseling Support on 11th-Grade High Educational Aspirations by College Generation Status (n = 15,970)

	Model 1		Model 2	
	β	(S.E.)	β	(S.E.)
Counselor caseload (log)	-.008	(.014)	-.007	(.017)
First-generation college (FGC) student	-.054**	(.017)	.146	(.151)

Counselor caseload (log) x FGC			-.034	(.026)
Dedicated college counselor	.025*	(.013)	.007	(.016)
First-generation college (FGC) student	-.055**	(.017)	-.078*	(.023)
Dedicated college counselor x FGC			.042†	(.024)
College counseling goal	.005	(.011)	-.041**	(.015)
First-generation college (FGC) student	-.053**	(.017)	-.073***	(.020)
College counseling goal x FGC			.034	(.024)
College counseling time	.022†	(.012)	-.008	(.015)
First-generation college (FGC) student	-.055**	(.017)	-.078***	(.020)
College counseling time x FGC			.048*	(.023)
Postsecondary plan required	.023	(.014)	.016	(.016)
First-generation college (FGC) student	-.054**	(.017)	-.087**	(.030)
Postsecondary plan required x FGC			.040	(.030)
College fairs offered	-.010	(.022)	-.038	(.030)
First-generation college (FGC) student	-.054**	(.017)	-.107*	(.043)
College fairs offered x FGC			.058	(.044)
College representative visits	-.000	(.028)	-.040	(.036)
First-generation college (FGC) student	-.054**	(.017)	-.119*	(.056)
College representative visits x FGC			.068	(.056)
College visits	.007	(.012)	.026†	(.015)
First-generation college (FGC) student	-.054**	(.017)	-.061**	(.023)
College visits x FGC			.006	(.024)
College prep programs	-.007	(.012)	-.024	(.016)
First-generation college (FGC) student	-.054**	(.017)	-.072***	(.019)
College prep programs x FGC			.036	(.024)
Information sessions	-.011	(.026)	-.001	(.029)
First-generation college (FGC) student	-.055**	(.016)	-.034	(.030)
Information sessions x FGC			-.025	(.030)
Financial aid	-.038†	(.022)	.023	(.025)
First-generation college (FGC) student	-.054***	(.017)	-.039†	(.021)
Financial aid x FGC			-.106*	(.048)
Counseling curriculum	.014	(.014)	-.020	(.027)
First-generation college (FGC) student	-.043*	(.020)	-.054**	(.017)
Counseling curriculum x FGC			-.010	(.049)
College transition	.008	(.012)	.001	(.016)
First-generation college (FGC) student	-.054**	(.017)	-.074***	(.023)
College transition x FGC			.031	(.024)

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.
†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 8 shows the results of the models exploring effects of college counseling and FGC status on college enrollment outcomes. Model 1 explored the separate effects of college counseling support and FGC status while Model 2 tested the interaction of both college counseling support and FGC status on college enrollment outcomes. The analysis yielded few significant results when testing the interaction of FGC status and college counseling support. However, similar to the results seen when testing interaction effects on college aspirations, schools where counselors focused their attention on college counseling saw increases in FGC enrollment in four-year institutions. Specifically, FGCs who attended schools where counselors spent more than 20% of their time on college counseling were 5.1 percentage points more likely to enroll in a four-year institution.

Table 8

Differential Effects of College Counseling Support on College Enrollment Outcomes by College Generation Status (n = 11,410)

	Model 1		Model 2	
	β	(S.E.)	β	(S.E.)
Counselor caseload (log)	-.058***	(.016)	-.030	(.021)
First-generation college (FGC) student	-.066**	(.019)	.193	(.175)
Counselor caseload (log) x FGC			-.045	(.030)
Dedicated college counselor	.013	(.014)	-.003	(.019)
First-generation college (FGC) student	-.068***	(.019)	-.076**	(.025)
Dedicated college counselor x FGC			.012	(.026)
College counseling goal	-.028*	(.013)	-.012	(.019)
First-generation college (FGC) student	-.067**	(.019)	-.058*	(.023)
College counseling goal x FGC			-.016	(.027)
College counseling time	.065***	(.013)	.032†	(.018)
First-generation college (FGC) student	-.069***	(.019)	-.093***	(.022)
College counseling time x FGC			.051*	(.026)

Postsecondary plan required	.036*	(.015)	.015	(.020)
First-generation college (FGC) student	-.068***	(.019)	-.086**	(.030)
Postsecondary plan required x FGC			.025	(.030)
College fairs offered	-.014	(.024)	-.008	(.032)
First-generation college (FGC) student	-.067**	(.019)	-.080†	(.046)
College fairs offered x FGC			.014	(.046)
College representative visits	.033	(.031)	.074	(.057)
First-generation college (FGC) student	-.068***	(.019)	-.020	(.070)
College representative visits x FGC			-.050	(.069)
College visits	.001	(.013)	.003	(.018)
First-generation college (FGC) student	-.067**	(.019)	-.077**	(.025)
College visits x FGC			.012	(.026)
College prep programs	-.036**	(.013)	-.017	(.020)
First-generation college (FGC) student	-.066**	(.019)	-.052*	(.021)
College prep programs x FGC			-.032	(.026)
Information sessions	-.030	(.028)	-.001	(.033)
First-generation college (FGC) student	-.070***	(.018)	-.038	(.034)
Information sessions x FGC			-.038	(.034)
Financial aid	-.011	(.026)	-.037	(.033)
First-generation college (FGC) student	-.067**	(.019)	-.070***	(.020)
Financial aid x FGC			.054	(.057)
Counseling curriculum	.004	(.013)	-.013	(.019)
First-generation college (FGC) student	-.067**	(.019)	-.081**	(.025)
Counseling curriculum x FGC			.022	(.026)
College transition	.007	(.013)	.009	(.018)
First-generation college (FGC) student	-.067**	(.019)	-.065**	(.022)
College transition x FGC			-.007	(.027)

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Discussion

The study found that upon entering high school FGCs were less likely to have high college aspirations. While the college aspirations of all students increased by 11th grade, the gap in high college aspirations between FGCs and non-FGCs increased when comparing 9th and 11th

grade responses. Additionally, the results support previous research that FGCs were less likely to enroll in four-year institutions and more likely to either not enroll in college or enroll at two-year institutions (Cataldi et al., 2018). The increasing gap in college aspirations and additional evidence that FGCs were less likely to enroll in four-year institutions should encourage education policymakers and administrators to examine differences in FGC and non-FGC postsecondary outcomes in their schools and consider implementing additional resources to close these college enrollment gaps.

The results of the study show that FGCs were less likely to have access to meaningful college counseling support. FGCs were less likely to attend schools with a dedicated college counselor or where counseling departments prioritize college counseling. FGCs were also less likely to attend high schools where counselors seek out additional ways to support their students in the transition from high school to college. However, while FGCs were less likely to attend high schools where counseling departments prioritize college counseling, there were more likely to attend schools that offered college-going resources such as college fairs, college visits, college preparation programs, and college information sessions. FGCs were also more likely to attend a school that required students to submit an education or career plan. Unfortunately, though FGCs were more likely to attend schools that offered college search resources, those resources were less effective in increasing college aspirations and enrollment outcomes of FGCs compared to prioritization of college counseling by the counseling departments. These results show that the college preparation programs alone are not effective in increasing college aspirations and enrollment outcomes. Counseling departments must be intentional about prioritizing college counseling and organizing departments to meet college counseling goals.

Consistent with previous research, this study found that college counseling support positively impacts the college aspirations and enrollment rates of high school students (Holland & Farmer-Hinton, 2009; McDonough, 1997; Pham & Keenan, 2011). Specifically, this study contributes to the literature through its findings that college counseling positively impacts college aspirations over time and college enrollment outcomes of FGCs when compared to FGCs who do not have access to college counseling resources. The results of the study illustrate that level of prioritization counseling departments place on college counseling over other counseling responsibilities may be the most impactful college counseling support for FGC students.

Overall FGCs with access to college counseling support were more likely to have high college aspirations in 11th grade. FGCs whose counselors prioritize college counseling time or had access to a counselor dedicated to college counseling were more likely to have higher college aspirations compared to their FGC peers without access to those resources. Interestingly, access to financial aid information and resources seemed to have a negative impact on college aspirations in 11th grade for FGC students, with FGCs who have access to this information reporting 10.6 percentage points lower for high college aspirations. When examining the impact of financial aid information on college aspirations on its own, the model showed a positive effect. However, when interacting FGC status with the financial aid variable, the negative effect on 11th grade college aspirations appears. This may suggest that for non-FGC students financial aid information is helpful in increasing college aspirations during high school which may be due to potentially higher family income levels and perceived ability to afford college.

For FGC students, on the other hand, more information about financing college between 9th and 11th grades might have an adverse impact on college aspirations if students are discouraged by "sticker shock." Sticker shock occurs when families see the price of attending

college without fully understanding access to merit and need-based financial aid opportunities. The lack of knowledge about opportunities for financial aid anc scholarships negatively effects enrollment of students who see the high cost of attendance at an institution and assume they are unable to afford a college education (Levine et al., 2020). If sticker shock is an issue for FGC students, perhaps starting with financial aid information earlier on in high school is less helpful. Instead, counseling departments should first focus on introducing college opportunities and encouraging students to apply, while waiting to discuss financial aid during the students' senior year of high school when they are more invested in the college application and enrollment processes.

Though there were significant differences in high college aspirations between FGCs who had access to college counseling support compared to FGCs who do not, the results of the study do not show the same differences in terms of college enrollment outcomes. In fact, very few of the independent variables related to college counseling significantly impacted college enrollment outcomes of FGCs. However, the results were consistent with the college aspirations results in that counseling departments that spent more time dedicated to college counseling saw better college enrollment outcomes for FGC students. The disparities in college counseling effects on college aspirations and college enrollment outcomes seems to indicate that solely increasing college aspirations is not enough to see meaningful differences in four-year college enrollment outcomes for FGC students. More steps need to be taken to ensure four-year college enrollment. One of these steps may include increasing college preparation which is the focus of Study II in this dissertation.

Limitations and Areas for Future Research

The study has a few key limitations. First, due to the use of a secondary dataset, the study is limited to only the responses and variables collected by the NCES. Additional responses regarding counselor demographics (e.g., race/ethnicity, FGC-status, sex) or availability of college counseling resources, such whether students are required to discuss college plans or how often college fairs are hosted, that could inform the results of the study were not collected. Second, while this study includes several control variables in its models that might impact college enrollment outcomes, it fails to account for factors related to college affordability, geographic distance, and other personal circumstances. The location of the institution as well as student's ability to afford college might be significant factors impacting college selection. Finally, though the HSLS:09 is nationally, representative sample, the cohort surveyed were 9th-grade students from 2009 so the results of the study may not be representative of more recent high school populations.

A challenge in the results of the study is that while the analysis examined student access to these resources, we do not know whether FGC students are effectively using these resources. Using the HSLS:09 and being limited to the questions asked in the survey instruments, hinders the ability to dive into the actual effectiveness of college counseling support instead of opportunities to access these resources. Future research should consider researching whether FGC students access these college counseling resources at the same rate as their non-FGC peers and, if so, the impact of the resources on college aspirations and enrollment.

Despite these limitations, this study makes several important contributions to the literature on the impact of college counseling support on the college aspirations and enrollment of FGCs. First, the study found that FGC students reported lower educational aspirations in 9th

grade compared to non-FGCs and that the college aspirations gap between FGCs and non-FGCs widened over time in high school. Second, the study found that FGC students were less likely to have access to college counseling support at their high schools. Third, the study shows that FGC students' college aspirations were positively impacted by the intervention of college counseling support during high school. These findings underscore the importance of increasing college counseling support in high school. Investment in college counseling personnel could contribute to closing college aspirations and, potentially, enrollment gaps between FGCs and non-FGCs.

CHAPTER 3

Study II: Disparities in First-Generation College Student Access to Advanced Coursework and College Counseling Support Impact on High School Course Enrollment

Introduction

As the results of Study I indicate, increasing the college aspirations of FGCs in high school is only half of the battle. Access to four-year postsecondary institutions is limited to those high school students who can show they are academically prepared for the rigor of their chosen institution (Roderick, et al, 2009; Santoli, 2002). Academic preparation in the college admission process has historically been demonstrated through standardized testing and high school academic coursework. However, since more postsecondary institutions have become test-optional after the COVID-19 pandemic, colleges and universities are focusing their admission selection processes on students' high school transcripts (Einhorn, 2022). While grades earned in high school are often the focus of college admission discussions, rigor of curriculum is often the determinate of academic preparedness for four-year colleges (Cognard, 1996).

Students who enroll in college preparatory courses indicate to college admission officers that they are interested in and prepared for the rigor of a college curriculum. However, curricula offered among U.S. high schools are not created equal. FGCs and low-income students are less likely to attend schools that offer college preparatory coursework compared to their non-FGC and higher income peers (Burns & Leu, 2019; McDonough, 1997; Perna, 2000) and less likely to be academically prepared for college upon entering (Choy, 2000). The lack of opportunity for FGCs and low-income students to enroll in college prep coursework at the same rate as their more advantaged peers contributes to the academic achievement gap between FGCs and non-FGC students.

College counselors can support FGCs in the high school course selection process by detailing the opportunities of college prep coursework and encouraging academically qualified FGCs to enroll. Throughout high school college counselors can check-in with FGCs at various points to ensure academic progress is being met in more rigorous coursework and that FGCs are continuing to stay on a path toward academic achievement.

Importance of Academic Preparation in the College-Going Process

Once a student decides that they want to attend college and builds the self-efficacy that they can successfully enroll, they must take steps to ensure they are academically prepared to enter four-year institutions after high school. One of the most influential aspects of the college application review process is the rigor of a student's chosen high school coursework (Clinedinst, 2019). College admission officers have good reason to consider high school coursework when determining which applicants should be admitted. The rigor of the high school curriculum is one of the strongest predictors of college enrollment (Schneider & Saw, 2016), college persistence (Choy, 2001), and collegiate academic success (Adelman, 2006; Trusty, 2004). These predictions are sharpest in mathematics, where researchers found that students with more advanced mathematics coursework and higher grades were more likely to enroll at four-year institutions (Belasco, 2013; Engberg & Wolniak, 2010; Perna, 2000). NCES data cited by Choy et al. (2000) shows that 12% of students dropped out of the college-going pipeline because they were academically underprepared.

U.S. high school students have several options for taking college preparatory coursework including the College Board's Advanced Placement (AP) curriculum, the International Baccalaureate's Diploma Programme (IBDP), dual enrollment (DE), or Honors courses. These more advanced college preparatory options often provide students the opportunity to take

college-level or college-equivalent courses during high school. In each program, based on exam scores (AP/IBDP) or grades (DE), U.S. colleges and universities may offer course credit to achieve advanced standing. Participation in college prep coursework can positively influence students to pursue postsecondary options due to students' knowledge that they may be able to enter college with advanced standing. Chajewski et al. (2011) found an increase in student college enrollment for those who took just one AP exam. However, because that research focused only on AP exam completion and did not consider those who took an AP course without sitting for the exam, the research does not show a clear correlation between the AP course itself and college enrollment. Still, the impact of college prep coursework on college enrollment and persistence outcomes has been documented (Adelman, 2006; Cataldi et al., 2018; Choy, 2001). FGC students lack opportunity to gain college academic preparation if they are not attending schools that offer college prep course options.

College Prep Course Enrollment for First-Generation College Students

There are key differences in college prep course availability and enrollment by race/ethnicity and socioeconomic status with Black, Latinx, and low-income students being less likely to have college prep coursework offered at their schools and less likely to enroll (Griffin & Allen, 2006; Oakes & Guiton, 1995; Solorzano & Ornelas, 2004). These differences remain consistent among FGCs vs non-FGCs. Only 16% of FGC students took an academically rigorous curriculum in high school compared to 37% of non-FGC students (Cataldi et al., 2018). Additionally, 18% of FGCs earned AP/IB credit while 44% of non-FGCs earned credit. Wealthier and non-FGC students have parents who can guide them through the course selection process at their high schools, ensuring that the students enroll in a rigorous academic program that will prepare them for the coursework at four-year colleges and universities. Assuming FGCs

have access to college prep coursework at their high schools, they often aren't receiving similar levels of course selection advice and encouragement from their parents and ultimately enroll in less rigorous coursework. This results in lower levels of college prep course enrollment, leaves them underprepared for more rigorous college curricula, and limits the types of colleges and universities they can attend.

Impact of College Counselor on College Preparation for First-Generation Students

The first study in this dissertation outlined the concept that counselors, as *influential others*, can impact college enrollment outcomes by increasing college aspirations for FGCs. However, the results indicated that increasing aspirations alone does not necessarily positively impact enrollment outcomes. Perhaps an additional step related to academic preparation is necessary. Counselors can use their knowledge, skills, and influence to encourage FGC students to enroll in college prep coursework. As mentioned above, FGCs may not be aware of the college preparatory courses that are available to them at their high schools and, even if they are, may lack the self-efficacy to enroll. Counselors can step in at this point to introduce FGCs to college prep course options, encourage them to enroll in college prep course, and monitor academic progress. Counselors also have a hand in curriculum design and – for those schools that don't offer college prep curricula – can encourage the school or district to begin offering more college prep courses that will prepare their students for college.

To date, however, there is a lack of empirical, quantitative evidence investigating whether access to college counseling resources for FGCs influences their high school college prep course enrollment and subsequent impacts of college prep coursework on college enrollment outcomes. This study aims to fill the research gaps surrounding the impact of college

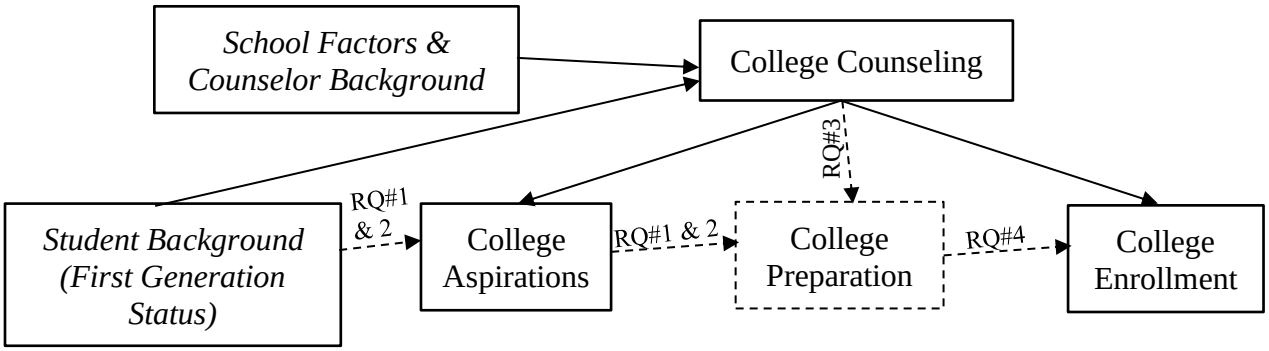
counseling support on FGC student college preparation by examining four specific research questions:

1) Whether and to what extent do college prep course offerings at the high school differ by college generation status?
2) For those with access to college preparation coursework, whether and to what extent do college prep course aspirations and enrollment rates differ by college generation status?
3) Whether and to what extent various college counseling supports relate to college prep course enrollment for FGC students?
4) To what extent does enrollment in college prep courses for FGCs impact college enrollment outcomes?

Figure 3 illustrates how this study relates to the overall conceptual framework guiding this dissertation.

Figure 3

College Counseling Support on College Pathway of FGC Students: A Conceptual Framework



Methods

Data & Sample

As outlined in Chapter 1, this study will use the HSLS:09 which is a nationally representative, longitudinal dataset. Though over 21,000 students were surveyed for the HSLS:09, this dissertation limits the dataset to only those students who were first-time 9th graders in 2009 (n = 20,180). The data for study 2 was further limited by only including students who participated in the first follow-up (2012) survey (n = 17,730). To limit the risk of disclosure of personally identifiable information, all unweighted sample sizes have been rounded to the nearest 10.

Measures

Control variables for this study relate to student background, school factors, and counselor background. The control variables and key independent variables are detailed in Chapter 2 (pages 31-39) and listed in Table 9 below. This study also utilizes independent variables related to college preparatory course enrollment.

Table 9

Study 2 Independent and Control Variables

Independent Variables	Control Variables
Counselor caseload	Sex
Dedicated college counselor	Race/Ethnicity composite
College prep counseling goal	Socioeconomic status
College prep counseling time	First-generation college status
Postsecondary plan required	9th-grade college aspirations
College fairs offered	Parent's educational expectations
College representative visits	9th-grade academic achievement
College visits	Confidence to earn bachelor's
College prep programs	Postsecondary plans
Information sessions	*High School Characteristics*

Financial aid	School type
Counseling curriculum	School locale
College transition	Racial/Ethnic composition
	Socioeconomic composition
	Percentage of AP enrolled students
	Four-year college enrollment
	Counselor Background
	Year's experience
	College degree

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Independent Variables: FGC and College Prep Course Enrollment

In addition to the college counseling independent variables detailed in Chapter 2, this study includes independent variables related to FGC status and college prep course enrollment.

First-Generation College Status

This variable was taken from the *Parent's Education* variable recorded in HSLS:09 as the highest level of education received by either parent living in the student's home. The parent's education HSLS:09 variable was constructed from two composite variables based on each parent respondent's highest level of education. This variable was recoded into binary categories of "FGC-Yes" (e.g., less than a high school diploma, a high school diploma/GED, or Associate's degree) and "FGC-No" (e.g., Bachelor's, Master's, Doctorate, or other advanced degree) based on the highest level of education received by either parent.

College Prep Course Enrollment

There is significant variety in the types of college prep courses offered to students at U.S. high schools. However, according to the Burns & Leu (2019), AP and IB courses are more likely to be offered at U.S. high schools compared to dual enrollment or other types of rigorous curricula. Therefore, this study focuses specifically on AP and IB course offering, aspirations,

and enrollment. To determine whether the student enrolled in college prep coursework, this study utilized two student-level variables from the 2013 update instrument that indicate enrollment in AP or IB coursework. Respondents were asked: "Which of the following types of courses for college credit did [you/he/she] take in high school?" Response options were: 1) Advanced Placement (AP); 2) International Baccalaureate; and 3) Any other course for college credit such as dual or concurrent enrollment courses. For each of the three options, respondents could select: 1) Yes; 2); No; or 3) Don't know. Due to the low number of students enrolled in IB coursework, a new variable (AP/IB) combining AP and IB was generated to indicate enrollment in any college prep course.

Dependent Variables: College Prep Course Aspirations and Enrollment

There are four levels of outcome variables to address the research questions of this study: whether college prep courses are offered at the high school, students' college prep course aspirations, students' college prep course enrollment, and college enrollment status.

College Prep Coursework Offered

To determine whether advanced courses (AP/IB) were offered at the students' high school, this study used two, school-level variables: AP courses offered on-site and IB courses offered by school. Base-year administrator respondents were asked "Which of the following programs or courses does [your school] offer on-site?" One of the selection options for this question was "College Board Advanced Placement (AP) courses." Administrator respondents were also asked the yes/no question "Does your high school offer an International Baccalaureate (IB) program?" A new dichotomous dummy variable for offering college prep coursework was generated based on responses to these two questions.

College Prep Course Aspirations

In base-year survey (2009), student respondents were asked "Have you taken or are you planning to take an Advanced Placement (AP) test?" and "Have you taken or are you planning to take a test for the International Baccalaureate (IB)?" Response options were: 1) No; 2) Yes; 3) You haven't decided yet; and 4) You don't know what this is. These two questions served as proxies for whether the student aspires to enroll in college prep coursework as students who opt into taking the AP and/or IB tests are more likely to want to enroll in an AP and/or IB course. A new dichotomous dummy variable for college prep aspirations was generated based on responses to these questions that identifies whether (Yes/No) a student aspired to enroll in college prep coursework.

College Prep Course Enrollment

To determine whether the student enrolled in college prep coursework, this study utilized two student-level variables from the 2013 update instrument that indicate enrollment in AP or IB coursework. Respondents were asked: "Which of the following types of courses for college credit did [you/he/she] take in high school?" Response options were: 1) Advanced Placement (AP); 2) International Baccalaureate; and 3) Any other course for college credit such as dual or concurrent enrollment courses. For each of the three options, respondents could select: 1) Yes; 2); No; or 3) Don't know. Due to the low number of students enrolled in IB coursework, a new variable combining AP and IB was generated to indicate enrollment in any college prep course.

Four-Year College Enrollment Status

In the second follow-up survey (2016) students were asked about their postsecondary institution enrollment. Students were asked their college enrollment status (or most recent undergraduate enrollment status) as of February 2016. Each student was then assigned an

institutional reference level for the most recent institution, undergraduate degree, or certificate program attended as of February 2016. Institutional reference levels were categorized as 1) 4-year; 2) 2-year; and 3) less than 2-year. Students who indicated that they did not enroll in postsecondary education were categorized as "Item legitimate skip/NA." Categories for non-response and missing values were also presented. For this analysis, a binary variable for four-year college enrollment level was created. Response values for skipped, non-responses, and missing were also recoded and excluded from the analysis.

Characteristics of Study Sample

This study examined the relationship between college counseling support, college prep course enrollment, and college enrollment status. Previous research has suggested that enrollment in college prep courses during high school can positively impact four-year college enrollment outcomes. High school counselors can support enrollment in college prep courses by detailing course option information for FGCs and encouraging students to challenge themselves by enrolling in college prep courses. Table 10 details descriptive statistics for college prep course offerings, aspirations, and enrollment while Table 11 provides insight on missing and non-response data.

Most U.S. high school students have access to college preparatory coursework in some form with 85.6% of students having reported access to AP courses and 6.2% of students with access to IB courses. Overall, students reported low college prep course aspirations with 33.1% and 11.3% of student aspiring to enroll in AP or IB courses, respectively. Differences in AP and IB course enrollment were even more stark. 35.8% of students enrolled in an AP course during high school while only 2.1% of students enrolled in an IB course.

Table 10

Study 2 Descriptive Statistics (n = 17,730)

	Mean	S.D.	Minimum	Maximum
College Prep Course Offerings				
Offers AP	.856	.351	0	1
Offers IB	.062	.241	0	1
College prep courses offered	.862	.345	0	1
College Prep Course Aspirations				
AP aspirations	.331	.470	0	1
IB aspirations	.113	.316	0	1
College prep course aspirations	.346	.476	0	1
College Prep Course Enrollment				
AP course enrollment	.358	.480	0	1
IB course enrollment	.021	.144	0	1
College prep course enrollment	.364	.481	0	1

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in fall of 2009.

Table 11

Study 2 Missing and Non-Response Data by Variable (n=17,730)

Variable	% Missing
College prep course offerings	
AP courses offered	6.04%
IB courses offered	14.81%
College prep course aspirations	
AP aspirations	18.67%
IB aspirations	19.23%
College prep course enrollment	
AP course enrollment	20.4%
IB course enrollment	20.44%

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in fall of 2009.

Statistical Analyses

The research questions were empirically tested using multivariate statistical analyses, specifically Linear Probability Models and Linear Regressions. There are multiple justifications for using LPMs in lieu of logit or probit models. The primary advantage of using LPMs is interpretability considering the large sample size provided in HSLS:09. In models with interaction effects among independent variables, logistic regressions can be challenging to interpret. On the other hand, LPM coefficients represent a change in probability of an outcome occurring if the independent variable is adjusted by one unit. Additionally, the research questions for this study compare differences among multiple indicators such as college aspirations over time, first-generation status, and college counseling support. There is an advantage in using LPMs for simplicity in comparing differences across these indicators (Mood, 2010).

Linear probability models (LPMs) were employed to test the first research question by quantifying the differences in AP and IB course offerings (binary dependent variables) between FGCs and non-FGCs. The LPMs are specified as:

$$\textit{AP Course Offered} = \beta_0 + \beta_1 FGC + \varepsilon$$

$$\textit{IB Course Offered} = \beta_0 + \beta_1 FGC + \varepsilon$$

$$\textit{College Prep (AP or IB) Course Offered} = \beta_0 + \beta_1 FGC + \varepsilon$$

LPMs were also used to test the second research question by quantifying the differences in AP and IB course aspirations (binary dependent variables) between FGCs and non-FGCs:

$$\textit{AP Course Aspirations} = \beta_0 + \beta_1 FGC + \varepsilon$$

$$\textit{IB Course Aspirations} = \beta_0 + \beta_1 FGC + \varepsilon$$

$$\textit{College Prep (AP or IB) Course Aspirations} = \beta_0 + \beta_1 FGC + \varepsilon$$

A series of LPMs were used to address the third research question with the interaction of first-generation college status with college counseling support variables to quantify differential effects of college counseling support on college prep course (AP/IB) enrollment by college generation status. The regression model is specified as:

$$College\ Prep\ Course\ (AP/IB) Enrollment$$
$$= \beta_0 + \beta_1 FGC + \beta_2 College\ Counseling\ Support + \beta_3 (FGC\ X\ College\ Counseling\ Support)$$
$$+ \beta_s STU + \beta_s SCH + \beta_s CSLR + \varepsilon$$

College counseling support represents one of 13 college counseling support variables examined in this study. *STU* represents student-level control variables included in the regression model whereas *SCH* represents school-level control variables. *CSLR* represents counselor background variables included in the regression model as controls.

A series of LPMs were also used to address the fourth research question with the interaction terms of first-generation college status with college prep course enrollment variables to quantify differential effects of college prep course enrollment on college enrollment outcomes by college generation status. To compare college enrollment outcomes only of those students with access to AP and IB coursework, the dataset was limited to only those students whose schools offered college prep coursework. The regression model is specified as:

$$Four - year\ college\ enrollment$$
$$= \beta_0 + \beta_1 FGC + \beta_2 College\ Prep\ Course\ Enrollment$$
$$+ \beta_3 (FGC\ X\ College\ Prep\ Course\ Enrollment) + \beta_s STU + \beta_s SCH + \beta_s CSLR + \varepsilon$$

College prep course enrollment represents a set of three variables (AP course enrollment, IB course enrollment, and AP or IB course enrollment). As this study uses data from school surveys and three student surveys, the W1STUDENT, W2W1STU, and W4W1W2W3STU analytic and probability weights were applied. The weights "account for school and student nonresponse" to make the estimates generalizable to the target population of first-time 9th-

graders in 2009 (Ingels et al., 2011, p. 117). The analyses for the third and fourth research questions were run utilizing probability or p-weights. P-weights were included because the weights are "proportional to the inverse of the probability then an observation is included due to sampling strategy" (Mehmetoglu & Jackson, 2017, p. 332).

Results

Disparities in College Prep Course Offerings among FGCs and non-FGCs

The first research question examined the differences in high school college prep course offerings between FGCs and non-FGCs (Table 12). Table 11 presents results of LPMs without control variables (unconditional models) to demonstrate the raw population differences in college prep course offerings between FGCs and non-FGCs without accounting for covariates. However, as FGCs and non-FGCs have systematically different demographics (Table 22), Table 29 presents the differences in college prep course offerings between FGCs and non-FGCs after controlling for key demographic characteristics (conditional models). The LPMs used to analyze differences in course options by college generation status found that 87.3% of non-FGCs reported attending high schools where AP courses were offered compared to 85.2% of FGCs (a 2.1-percentage point gap). Due to the few opportunities for all students to take IB courses, I combined AP and IB course taking opportunities into one "college prep courses offered" variable. 87.6% of non-FGCs attended schools where college prep courses were offered compared to 86% of FGCs (a 1.6-percentage point gap).

Table 12

Differences in College Prep Course Offerings by College Generation Status

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	

AP courses offered	.873	.005	.852	.006	-.021***
IB courses offered	.064	.003	.059	.004	-.005
College prep courses offered	.876	.005	.860	.006	-.016**

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Disparities in College Prep Course Aspirations and Enrollment among FGCs and non-FGCs

Table 13 details the results from testing research question 2, specifically quantifying disparities in college prep course aspirations and enrollment by college generations status. LPMs were run both with and without control variables. Results of analyses run with control variables are presented in Table 31. The results found that 44.8% of non-FGCs aspired to enroll in AP courses upon entering high school in 9th grade compared to 29.2% of FGCs (a 15.6-percentage point gap). IB course aspirations were overall lower than AP course aspirations with 13.2% of non-FGCs aspiring to enroll in IB courses compared to 11.1% of FGCs (a 2.1-percentage point gap). Due to the lower aspirations in IB course aspirations as well as the fewer opportunities for IB coursework detailed in Table 11, a new variable for college prep course aspirations that includes both AP and IB aspirations was generated. 46.3% of non-FGCs aspired to enroll in college prep coursework in 9th grade compared to 30.9% of FGCs (a 15.4-percentage point gap).

In terms of college prep course enrollment, non-FGCs were more likely to enroll in college prep coursework. 54.5% of non-FGCs enrolled in AP courses in high school compared to 24.8% of FGCs (a 29.7-percentage point gap). Consistent with other results, IB course

enrollment was overall lower with 3.1% of non-FGCs enrolled in IB courses compared to 1.3% of FGCs (a 1.8-percentage point gap). When combining AP and IB course enrollment into one college prep course enrollment variable, 55% of non-FGCs enrolled in college prep coursework compared to 25.3% of FGCs (a 29.7-percentage point gap).

Table 13

Differences in College Prep Course Aspirations and College Prep Course Enrollment by College Generation Status

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Advanced course aspirations					
AP course aspirations	.448	.007	.292	.009	-.156***
IB course aspirations	.132	.005	.111	.006	-.021***
College prep course aspirations	.463	.007	.309	.009	-.154***
Advanced course enrollment					
AP course enrollment	.545	.006	.248	.008	-.297***
IB course enrollment	.031	.002	.013	.003	-.018***
College prep course enrollment	.550	.006	.253	.008	-.297***

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Relationship Among College Counseling Support and College Prep Course Enrollment among FGCs

A series of LPMs were used to test research question 3 by estimating the effect of college counselor support on high school college prep course enrollment. The analyses accounted for the control variables listed in Table 10. Model 1 explores the effect of college counseling support

and FGC status separately on college prep course enrollment (Table 14). However, Model 2 tests the interaction of both college counseling support and FGC status on college prep course enrollment.

The results of Model 1 indicate that having access to a counselor who is dedicated to college counseling (2.8 percentage points) or a counseling department that spends at least 20% of its time dedicated to college counseling (4.6 percentage points) saw positive impacts on college prep course enrollment. Additionally, increases in counselor caseloads saw negative impacts on college prep course enrollment (4.8 percentage points). Schools that hosted college visits also saw positive college prep course enrollment outcomes (3.2 percentage points).

Model 2, which tested the interaction of college counseling support and FGC status, found that FGCs with access to college information sessions were 7.1 percentage points more likely to enroll in college prep courses compared to FGCs without access to information sessions. Interestingly, FGCs who attended schools that offered college prep programs such as Upward Bound or AVID were 5.5 percentage points less likely to enroll in college prep courses compared to FGCs who attended schools that did not offer college prep programs. Additionally, FGCs who attended schools where counseling departments that offered college transition support were 5.7 percentage points less likely to enroll in college prep courses. On their own, both the college prep programs and college transition variables showed positive effects. However, when interacting these variables with FGC status, they have a negative impact on college prep course enrollment.

Table 14

Differential Effects of College Counseling Support on College Prep Course Enrollment by College Generation Status (n = 11,410)

	Model 1		Model 2	
	β	(S.E.)	β	(S.E.)
Counselor caseload	-.048*	(.019)	-.006	(.023)
First-generation college (FGC) student	-.022*	(.019)	.250	(.198)
Counselor caseload x FGC			-.047	(.033)
Dedicated college counselor	.028*	(.013)	.036†	(.019)
First-generation college (FGC) student	-.025	(.019)	-.016	(.024)
Dedicated college counselor x FGC			-.016	(.026)
College counseling goal	-.003	(.012)	-.013	(.018)
First-generation college (FGC) student	-.022	(.019)	-.034	(.023)
College counseling goal x FGC			.023	(.026)
College counseling time	.046**	(.013)	.031†	(.018)
First-generation college (FGC) student	-.021	(.019)	-.023	(.021)
College counseling time x FGC			.003	(.026)
Postsecondary plan required	.010	(.015)	.021	(.020)
First-generation college (FGC) student	-.023	(.019)	-.005	(.030)
Postsecondary plan required x FGC			-.023	(.030)
College fairs offered	-.041†	(.023)	-.068*	(.034)
First-generation college (FGC) student	-.021	(.019)	-.076	(.054)
College fairs offered x FGC			.059	(.046)
College representative visits	-.011	(.037)	-.022	(.053)
First-generation college (FGC) student	-.022	(.019)	-.034	(.074)
College representative visits x FGC			.012	(.073)
College visits	.032**	(.012)	.028	(.017)
First-generation college (FGC) student	-.023	(.019)	-.028	(.023)
College visits x FGC			.008	(.025)
College prep programs	.017	(.013)	.045*	(.019)
First-generation college (FGC) student	-.023	(.019)	.003	(.020)
College prep programs x FGC			-.055*	(.025)
Information sessions	.020	(.028)	-.030	(.032)
First-generation college (FGC) student	-.033	(.018)	-.092**	(.033)
Information sessions x FGC			.071*	(.033)
Financial aid	-.027	(.024)	.006	(.031)
First-generation college (FGC) student	-.023	(.019)	-.018	(.019)
Financial aid x FGC			-.089†	(.048)
Counseling curriculum	.051	(.013)	.021	(.019)
First-generation college (FGC) student	-.022	(.019)	-.010	(.025)
Counseling curriculum x FGC			-.018	(.026)
College transition	-.001	(.013)	.033†	(.018)
First-generation college (FGC) student	-.022	(.019)	-.000	(.021)

College transition x FGC	-.057*	(.026)

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Relationship Among College Prep Course Enrollment and College Enrollment Outcomes among FGCs

Past research has suggested that increased academic rigor in high school should positively impact four-year college enrollment outcomes (Cognard, 1996; Schneider & Saw, 2016). To address the fourth research question, LPMs were used to better understand the relationship between college prep course enrollment and college enrollment outcomes. The analyses accounted for the control variables listed in Table 9. Model 1 explores the effect of college prep course enrollment and FGC status separately on four-year college enrollment outcomes (Table 15). However, Model 2 tests the interaction of both college prep course enrollment and FGC status on four-year college enrollment outcomes to quantify the differences in college prep course enrollment opportunities among the FGC population of students.

The results of the analysis show that FGCs who enroll in college prep coursework are more likely to enroll in four-year institutions after high school. Due to the limited number of U.S. high school students who can enroll in IB coursework, a "college prep course enrollment" variable was generated to better understand the overall impact of college prep coursework (AP or IB) on college enrollment outcomes. The results of this model showed that FGCs who enrolled in either AP or IB courses in high school were 5 percentage points more likely to enroll in a four-

year postsecondary institution compared to their FGC peers who did not enroll in AP or IB courses in high school (statistically significant at the critical level of 10%).

Table 15

Differential Effects of College Prep Course Enrollment on College Enrollment Outcomes by College Generation Status (n = 11,410)

	Model 1		Model 2	
	β	(S.E.)	β	(S.E.)
AP course enrollment	.285***	(.017)	.246***	(.020)
First-generation college (FGC) student	-.055**	(.019)	-.079***	(.023)
AP course enrollment x FGC			.047	(.029)
IB course enrollment	.106**	(.034)	.050	(.034)
First-generation college (FGC) student	-.061**	(.020)	-.064**	(.021)
IB course enrollment x FGC			.076	(.075)
College prep course enrollment	.283***	(.017)	.242***	(.020)
First-generation college (FGC) student	-.064**	(.019)	-.089***	(.022)
College prep course enrollment x FGC			.050†	(.028)

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Discussion

Academic preparation is a key component in the college admission process. Without evidence of rigorous coursework in high school and strong grades, students are less likely to be academically successful and persist at four-year institutions. The results of this study are consistent with previous literature that argues that FGCs are less likely to have access to college prep coursework at their high schools compared to their non-FGC counterparts (Burns & Leu, 2019; McDonough, 1997; Perna, 2000). While students across the board seemed to have little

access to IB courses, AP courses seemed to be more widely available to students in U.S. high schools. However, the results indicate that FGCs were slightly less likely to have AP courses offered at their high schools. The lack of access to college prep coursework ultimately puts FGC students at a disadvantage in terms of academic achievement and college enrollment outcomes.

Consistent with course offerings, IB course aspirations were much lower than AP course aspirations for 9th-grade students. I would attribute lower IB course aspirations to lack of nationwide knowledge about the IB curriculum as it is offered in very few schools. When looking at college prep course aspirations overall, the fact that FGCs were less likely to aspire to take college prep courses speaks to their disbelief that they can succeed academically and is also consistent with the results of Study 1 that showed that FGCs reported lower educational aspirations. Lower course aspirations at the start of high school negatively impacts academic achievement in high school and ultimate college enrollment outcomes. The results of the analysis show that non-FGCs were two times more likely to enroll in college prep coursework compared to FGC students. Considering that the gaps in college prep course offerings between FGCs and non-FGCs were relatively small, there may be other factors impacting lower college prep course aspirations and enrollment. Taken together, the gaps in college prep course aspirations and enrollment between FGCs and non-FGCs indicate that there may be within school tracking by school officials, including high school counselors, that discourage FGCs from enrolling in college preparatory courses.

The results of the analyses indicated that FGC students were more likely to enroll in college prep coursework when counseling departments hosted college information sessions. Introducing information about the importance of college prep courses on academic preparation and college admission in early high school might encourage FGCs who may not have previously

considered taking college prep courses to enroll. On the other hand, the fact that on its own, the college prep programs variable has a positive impact but a negative impact when interacting with FGC status suggests that schools that college prep programs might have a positive effect on college prep course enrollment for non-FGCs. FGCs who are enrolled in college prep programs such as Upward Bound or AVID might believe that they already have the college preparation necessary to pursue postsecondary education and subsequently choose to devote their academic efforts to college prep programs instead of college prep coursework whereas non-FGCs, using their social and cultural capital, use college prep programs to enhance their academic achievement and ability to enroll in college prep courses. Additionally, the results that showed that additional college transitional support by counselors was not beneficial to FGCs, but might be beneficial to non-FGCs, may be attributed to the fact that this support comes later in high school after course selection has mostly concluded.

It is clear from the analyses that college prep course enrollment does positively impact four-year college enrollment outcomes. FGCs who enrolled in college prep coursework were more likely to enroll in four-year college enrollment outcomes. The results of the study indicate that school administrators and policymakers should focus on ensuring that all students regardless of background have access to college prep courses at their high schools so that they can ensure academic preparation for postsecondary education opportunities. Additionally, high school counseling departments should focus on creating and implementing an integrated academic and college counseling curriculum so that students can better understand the impact their course enrollment decisions have on postsecondary outcomes. Waiting until 11th or 12th grade to begin encouraging students to take college prep coursework to ensure preparation for four-year

institutions might be too late. Counseling departments should meet with students and parents early to explain the college opportunity impact of courses taken in high school.

Limitations and Areas for Future Research

The study has a few key limitations. First, due to the use of a secondary dataset the study is limited to only the responses and variables collected by the NCES. While *plans to take an AP or IB test* might serve as strong proxies for college prep course aspirations, a specific question about planned rigor of high school curriculum in the survey would make the study results and analyses more robust. Second, consistent with Study 1, while this study includes several control variables in its conditional regression models that might impact college enrollment outcomes, it fails to account for factors related to college affordability, geographic distance from, and other personal circumstances. The location of the institution as well as student's ability to afford college might be significant factors impacting college selection. Third, the study uses composite variables for SES, parents' educational background, and parents' educational expectations. While these variables are helpful in understanding student demographics, research in this area might be more robust if mother and father income, educational background, and educational expectations were disaggregated.

A consistent result we saw in this study was the limited access that students had to IB courses. The limitations in the vastness of IB course offerings among U.S. high schools is a challenge. However, an additional challenge is that the HSLS:09 survey questions asked specifically about taking IB courses but not enrollment in the IB Diploma Programme. Research has shown that students who enroll in the full IB Diploma Programme which includes a much more prescribed curriculum as well as a research requirement, are better prepared for postsecondary education opportunities than those who take IB courses ad-hoc (Pilchen et al.,

2020). Future research might examine differences in college enrollment outcomes for FGCs who enroll in IB courses versus the full IB Diploma Programme.

This study does not closely examine whether FGC students who have lower college prep course aspirations upon entering high school are less likely to enroll in college prep courses. While the scope of this study looked at college prep course offering, aspirations, and enrollment levels in aggregate, a more specific study that links FGC aspirations directly to college prep course taking outcomes might be helpful. Additionally, an examination of whether there are college prep course taking differences for FGCs with low course aspirations who accessed college counseling resources in early high school might yield insightful results.

Finally, this study does not examine whether students utilized college counseling resources and specifically doesn't examine whether students spoke to college counselors about course enrollment. While the focus of this dissertation is whether offering college counseling resources at the high school makes an impact on college aspirations, preparation, and enrollment outcomes, it does not take into consideration whether students accessed these resources. Thus, there may be some threats to validity introduced as we do not know if there is a direct correlation. It is possible that students are still seeing positive college prep course enrollment rates and college enrollment outcomes without any intervention by a counselor. Future research might want to specifically examine whether accessing college counseling resources at the high school impacts college prep course enrollment and college enrollment outcomes of FGCs.

The results of this study contribute to the research on FGC access to college prep coursework and course enrollment impact on college enrollment outcomes in several ways. First, the study confirms previous research that FGCs are less likely to have access to college preparatory coursework at their high schools. Second, the study provides national evidence that

FGCs are less likely to aspire to enroll in college prep courses compared to their non-FGC peers. Third, the results confirm that FGCs who enrolled in college prep courses in high school saw higher four-year college enrollment outcomes. Taken together, the results indicated that lower college prep course aspirations in early high school can lead to lower levels of college prep course enrollment by FGCs. Lower levels of college prep course aspirations and enrollment levels then impact four-year college enrollment rates which contribute to the overall achievement gaps between FGCs and non-FGCs. The study provides evidence that access to information about the need for collegiate academic preparation by counseling departments through college counseling resources such as information sessions, might positively influence college prep enrollment rates of FGCs. Given these results, counseling departments should invest time in communicating with FGCs early about the importance of including college prep courses in their high school curriculum.

CHAPTER 4

Study III: Impact of College Counseling Support and Advanced Coursework of College Enrollment Selectivity of First-Generation College Students

Introduction

Studies one and two in this dissertation focus on examining the impact of college counseling support on college aspirations and college preparedness. Despite strong college aspirations and academic preparedness, some FGCs may still be undermatching when enrolling in postsecondary institutions. Four-year institutions in the United States are diverse and educations offered by each institution are not created equal. Some institutions are small, liberal arts colleges that focus on interdisciplinary learning across a broad curriculum while other institutions serve as research universities with an array of pre-professional programs and in-depth training in specific fields. Research has shown that there are retention, graduation, and earnings gaps among less selective and more selective four-year institutions (Bowen & Bok, 1998; Brewer et al., 1999; Carnevale & Rose, 2004). Brewer et al.'s (1999) research found that there is a stronger economic return from attending a selective private four-year college or university when compared to less selective or elite institutions.

FGCs may lack the college knowledge necessary to successfully apply to and enroll at highly selective, four-year postsecondary institutions. For these students, college counselors can once again intervene to provide enhanced knowledge about the diversity of college options and encourage FGCs to apply to highly selective institutions that may not have previously considered. Additionally, college counselors can help students navigate the transitionary period during the summer between high school and college to ensure that the students matriculate at their chosen institutions for the fall term. I hypothesize that FGC students will avoid college

enrollment undermatching if they receive college counseling support at the high school level, however there is currently a lack of empirical evidence to support this hypothesis.

This study seeks to disaggregate the four-year college enrollment outcomes by college selectivity of first-generation college students when controlling for background characteristics. Specifically, the study aims to better understand how access to college counseling support and college preparatory curriculum at the high school level impacts college enrollment undermatching.

Selective College Enrollment of First-Generation College Students

The economic value of a college degree is very rarely debated. Research has shown that, in general, a postsecondary education provides greater income, higher civic engagement, and higher rates of employment (Klasik, 2011). However, the most selective colleges generally provide an even higher return on investment and can make a substantial difference in lifetime earnings for African American, Latinx, and FGC students (Baker et al., 2018; Dale & Krueger, 2014; Schmidt et al., 2011). This may be because these students are less likely to have the social capital and access to influential others for job placement opportunities and attending a highly selective institution can provide greater access to postgraduate options through name recognition and high-level networking opportunities (Baker et al., 2018; Dale & Krueger, 2014).

Unfortunately, FGCs are less likely to attend highly selective four-year institutions. FGCs make up 69% of the students at open-enrollment four-year institutions where students are admitted regardless of academic preparation. By contrast, FGCs make up only 28% of very-selective, four-year colleges and universities (Startz, 2022). This is true even for FGCs who are academically qualified to attend highly selective institutions (Smith et al., 2013). When FGCs undermatch by attending open-enrollment or less selective colleges and universities, they miss

out on the postgraduate and economic opportunities more selective institutions can provide. FGC students are more likely to lack the knowledge, resources and connections to these highly selective institutions. College counselors as *influential others* can enhance the social and cultural capital of FGCs by using their connections to college admission officers as well as financial aid and college advising information.

Selective College Choice and Undermatching

After students have successfully navigated the college aspirations and preparation phases of the conceptual model, they begin to enter college enrollment. During this phase, students choose which institutions they want to apply to and ultimately enroll. In the College Enrollment phase, students consider a variety of factors related to their college enrollment including size, location, public vs private, residential vs commuter, community makeup, and academic programs offered. FGCs might especially consider the career outcomes of their chosen institution as they weigh the potential cost-benefit of enrolling in a four-year institution instead of a two-year college or immediately entering the workforce. Jez (2014) refers to the economic cost-benefit model embedded within the status attainment model (Blau & Duncan, 1967) and applies this theory to the college decision process of low- and high-income students. Jez (2014) argues that students with increased social and cultural capital are better able to estimate the cost-benefit of attending college and perhaps are better able to foresee future benefits of a college or postgraduate degree.

This cost-benefit model can be extrapolated to understand why students from underrepresented groups might also choose to attend lower cost public institutions versus more selective and prestigious private institutions. As students consider these factors, they may choose to enroll at an institution for which they are overqualified - *undermatching*. Smith et al.'s (2013)

nationally representative research found that about 40% of college-going students undermatch. The research found marked undermatching for low-income students and FGCs. The undermatching for FGCs may be due to lack of college knowledge including information about financial aid, postgraduate outcomes, location, and campus community.

College Counselor Role in Selective College Enrollment

College counselors can play a role in the college enrollment phase by guiding students through the college search, application. and enrollment processes and providing FGCs with the missing college knowledge. Gast's (2022) research found that Black and FGC students benefited from counselor guidance during the college enrollment phase. Counselors once again take on the role of *influential other* to introduce students to a variety of college opportunities that they potentially had not considered and connect FGCs with college resources, faculty, and staff. Additionally, as students begin the college application process, counselors are able to guide FGCs through the admission and financial aid processes and assist them in completing the necessary steps to successfully apply to and enroll at selective institutions.

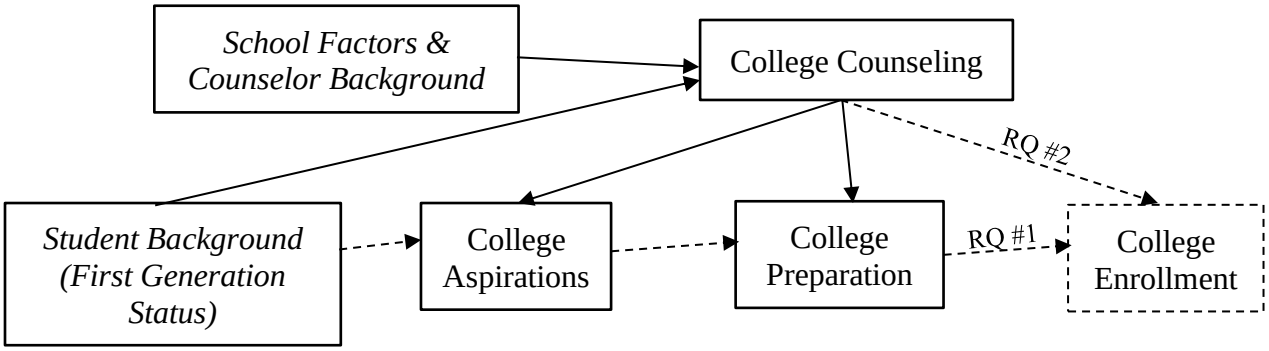
Ovink et al. (2018) argue that students are in charge of their college decisions and thinking of college selection from this deficit mindset ignores that FGCs and low-income students might rationally choose to attend a less selective institution in order to stay closer to home or save money. Still Ovink et al.'s (2018) research ultimately shows that college match matters in terms of postsecondary outcomes. Even in situations when under resourced students might be considering a less selective institution for one of the reasons listed above, the college counselor can provide a wider array of options and opportunities that still match the student's needs, but also won't result in undermatching.

The aim of the final study in this dissertation is to better understand the relationship between college counseling support and college undermatching. Figure 3 illustrates how this study relates to the overall conceptual framework guiding this dissertation. Three specific research questions guide the aim of this study:

1) Whether and to what extent does FGC status relate to college enrollment selectivity?
2) To what extent does access to college counseling resources impact college enrollment selectivity of FGCs?

Figure 4

College Counseling Support on College Pathway of FGC Students: A Conceptual Framework



Methods

Data & Sample

As outlined in Chapter 1, this study will use the HSLS:09 which is a nationally, representative longitudinal dataset. Though over 21,000 students were surveyed for the HSLS:09, this study limits the dataset to only those students who were first-time 9th graders in 2009 and had college prep courses available to them at their high schools (n = 17,210). To limit the risk of disclosure of personally identifiable information, unweighted sample sizes have been rounded to the nearest 10.

Measures

Independent variables in this study relate to college counseling support. Control variables for this study relate to student background, school control, and counselor background. The control variables and independent variables used for this study are detailed in Chapters 2 (pages 31-39) and listed in Table 16 below. Descriptive statistics for these variables can be found in Table 3. As this study uses data from school surveys and three student surveys, the W1STUDENT, W2W1STU, and W4W1W2W3STU analytic and panel weights were applied. The weights "account for school and student nonresponse" to make the estimates generalizable to the target population of first-time 9th-graders in 2009 (Ingels et al., 2011, p. 117).

Table 16

Study 3 Independent and Control Variables

Independent Variables	Control Variables
Counselor caseload	Sex
Dedicated college counselor	Race/Ethnicity composite
College prep counseling goal	Socioeconomic status
College prep counseling time	First-generation college status
Postsecondary plan required	9th-grade college aspirations
College fairs offered	Parent's educational expectations
College representative visits	9th-grade academic achievement
College visits	Confidence to earn bachelor's
College prep programs	Postsecondary plans
Information sessions	*High School Characteristics*
Financial aid	School type
Counseling curriculum	School locale
College transition	Racial/Ethnic composition
	Socioeconomic composition
	Percentage of AP enrolled students
	Four-year college enrollment
	Counselor Background
	Years of experience
	College degree

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Dependent Variable: Four-Year College Selectivity Level

The dependent variable in this study relates to students' college enrollment selectivity level. In the second follow-up survey (2016) students were asked about their college enrollment status (or most recent undergraduate enrollment status) as of February 2016. Each student was then assigned an institutional selectivity level for the most recent institution, undergraduate degree, or certificate program attended as of February 2016. Institutional reference levels were categorized as 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; or 6) Selectivity not classified, less than 2-year institution. Students who indicated that they did not enroll in postsecondary education were categorized as "Item legitimate skip/NA." Categories for non-response and missing values were also presented and made up 24.97% of responses. For this analysis, a six-category selectivity level variable was generated. The six categories were: 1) Not in School; 2) Not assigned; 3) Two-year; 4) Non-selective; 5) Moderately selective; and 5) Highly selective. Missing values were also recoded and excluded from the analysis.

Characteristics of Study Sample

This study examined the relationship between access to college counseling support and college enrollment selectivity level. Table 17 details descriptive statistics for college enrollment selectively level. To better understand the demographic and high school characteristics of students enrolled in college by selectivity level, descriptive statistics by college enrollment selectivity level are detailed in Table 18.

14.2% of HSLS:09 respondents reported enrolling in highly selective colleges and universities after high school. 20.6% and 4.9% of respondents reported enrolling in moderately selective or non-selective/inclusive institutions, respectively, after high school. 25.4% of respondents were enrolled in two-year institutions and 8.9% were enrolled in institutions that were not assigned a selectivity level in the HSLS:09. When examining demographic data by college generation status, the results found that Black and Hispanic students made up 15.1% and 19.5%, respectively, of students at non-selective, four-year institutions compared to 5% and 11.7% of students at highly selective institutions. Non-FGCs made up 67.4% of students at highly selective colleges compared to 22.9% FGCs. Students who entered high school with high college aspirations or whose parents had high educational expectations were more likely to report enrolling at highly selective colleges after high school.

Table 17

Study 3 Descriptive Statistics (n = 10,940)

	Mean	S.D.	Minimum	Maximum
College Selectivity Level				
Highly selective	.142	.349	0	1
Moderately selective	.206	.404	0	1
Non-selective	.049	.216	0	1
Two-Year	.254	.435	0	1
Not assigned	.089	.284	0	1
Not in school	.254	.435	0	1
Selectivity level missing	.007	.082	0	1

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in fall of 2009.

Table 18

Respondent Demographics by College Selectivity Level (n = 10,880)

	Not in School		Two-Year		Four-Year Colleges & Universities						Not Assigned	
					Non-selective		Moderately Selective		Highly Selective			
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Female	.430	.495	.467	.499	.493	.500	.558	.497	.531	.499	.605	.489
White	.454	.498	.432	.495	.508	.500	.616	.486	.691	.462	.605	.489
Black	.156	.363	.128	.334	.151	.358	.121	.326	.050	.218	.117	.321
Hispanic	.265	.442	.313	.464	.195	.397	.148	.355	.117	.322	.266	.442
Multi-race	.091	.288	.078	.268	.095	.294	.072	.258	.049	.216	.134	.341
Other race	.019	.135	.012	.108	.011	.105	.008	.091	.008	088	.010	.101
Socioeconomic Status (SES)	-.423	.595	-.221	.665	.051	.749	.227	.702	.658	.763	-.162	.675
First-generation college status (FGC)	.616	.487	.582	.493	.507	.500	.388	.487	.229	.420	.573	.495
Non-FGC	.111	.314	.220	.414	.356	.479	.464	.499	.674	.469	.227	.419
FGC missing	.273	.446	.060	.237	.137	.344	.148	.355	.097	.296	.200	.400
9th Grade Educational Aspirations												
High school	.276	.446	.134	.341	.049	.216	.051	.220	.040	.197	.141	.348
Associate's degree	.088	.282	.075	.263	.067	.250	.044	.205	.018	.134	.115	.321
Bachelor's degree	.121	.326	.186	.389	.199	.400	.201	.401	.188	.391	.166	.372
Master's degree	.126	.332	.197	.398	.264	.441	.284	.451	.284	.451	.174	.379
Ph.D. or professional degree	.121	.326	.176	.381	.280	.450	.257	.437	.341	.474	.183	.387
Don't know	.269	.443	.232	.422	.141	.348	.163	.369	.128	.334	.221	.415
Parent's Education Expectations												
High school	.154	.361	.060	.237	.013	.113	.009	.094	.003	.051	.058	.233

Associate's degree	.129	.335	.094	.292	.086	.281	.035	.185	.031	.174	.013	.114
Bachelor's degree	.163	.369	.272	.445	.311	.463	.315	.465	.213	.410	.249	.433
Master's degree	.076	.266	.126	.332	.224	.418	.236	.425	.284	.451	.116	.320
Ph.D. or professional degree	.100	.301	.128	.334	.224	.417	.199	.400	.311	.463	.185	.388
Don't know	.104	.305	.130	.336	.056	.230	.062	.241	.078	.268	.099	.298

Source: U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. n = sample size. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in fall of 2009.

Analytic Strategies

The research questions were empirically tested using multivariate statistical analyses. Linear probability models were employed to test the first research question. There are multiple justifications for using LPMs in lieu of logistic regression to test the first research question. The primary advantage of using LPMs is interpretability considering the large sample size provided in HSLS:09. In models with interaction effects among independent variables, logistic regressions can be challenging to interpret. On the other hand, LPM coefficients represent a change in probability of an outcome occurring if the independent variable is adjusted by one unit. Additionally, the research questions for this study compare differences among multiple indicators such as college aspirations over time, first-generation status, and college counseling support. There is an advantage in using LPMs for simplicity in comparing differences across these indicators (Mood, 2010).

Linear probability models (LPMs) tested the first research question by quantifying the differences in college enrollment selectivity between FGCs and non-FGCs. The LPMs are specified as:

$$\textit{College Enrollment Selectivity Level} = \beta_0 + \beta_1 FGC + \varepsilon$$

A series of multinomial logistic regressions (MLRs) were used to address the second research question examining the relationship of college counseling supports with college enrollment selectivity level for FGCs. The regression models are specified as:

$$ln\left(\frac{P(Selectivity = Not\ Assigned}{P(Selectivity = Not\ Enrolled}\right)$$
$$= \beta_{10} + \beta_{11} FGC + \beta_{12} College\ Counseling\ Support + \beta_{13} FGC\ X\ College\ Counseling\ Support$$
$$+ \beta_{14} STU + \beta_{15} SCH + \beta_{16} CSLR + \varepsilon$$

$$ln\left(\frac{P(Selectivity = Two-Year}{P(Selectivity = Not\ Enrolled)}\right)$$

$$= \beta_{20} + \beta_{21}FGC + \beta_{22}College\ Counseling\ Support + \beta_{23}FGC\ X\ College\ Counseling\ Support$$

$$+ \beta_{24}STU + \beta_{25}SCH + \beta_{26}CSLR + \varepsilon$$

$$ln\left(\frac{P(Selectivity = Non-selective)}{P(Selectivity = Not\ Enrolled}\right)$$

$$= \beta_{30} + \beta_{31}FGC + \beta_{32}College\ Counseling\ Support + \beta_{33}FGC\ X\ College\ Counseling\ Support$$

$$+ \beta_{34}STU + \beta_{35}SCH + \beta_{36}CSLR + \varepsilon$$

$$ln\left(\frac{P(Selectivity = Moderately\ Selective)}{P(Selectivity = Not\ Enrolled}\right)$$

$$= \beta_{40} + \beta_{41}FGC + \beta_{42}College\ Counseling\ Support + \beta_{43}FGC\ X\ College\ Counseling\ Support$$

$$+ \beta_{44}STU + \beta_{45}SCH + \beta_{46}CSLR + \varepsilon$$

$$ln\left(\frac{P(Selectivity = Highly\ Selective)}{P(Selectivity = Not\ Enrolled}\right)$$

$$= \beta_{50} + \beta_{51}FGC + \beta_{52}College\ Counseling\ Support + \beta_{53}FGC\ X\ College\ Counseling\ Support$$

$$+ \beta_{54}STU + \beta_{55}SCH + \beta_{56}CSLR + \varepsilon$$

College counseling support represents each of 13 counseling support variables examined in this study. *STU* represents student-level control variables included in the regression model whereas *SCH* represents school-level control variables. *CSLR* represents counselor background variables included in the regression model as controls. The analyses for the research questions were run utilizing probability or p-weights. P-weights were included because the weights are "proportional to the inverse of the probability then an observation is included due to sampling strategy" (Mehmetoglu & Jackson, 2017, p. 332).

Results

Disparities in College Enrollment Selectivity Level among FGCs and non-FGCs

The first research question examined the differences in college enrollment selectivity level between FGCs and non-FGCs (Table 19). LPMs were run both with and without control variables.. Table 19 presents results of LPMs without control variables (conditional models) to

demonstrate differences between FGCs and non-FGCs without accounting for covariates. However, as FGCs and non-FGCs have systematically different demographics (Table 22), Table 34 presents the differences in college enrollment selectivity levels between FGCs and non-FGCs after controlling for key demographic characteristics (conditional models). The LPM results found that 30.4% of non-FGCs reported enrolling in highly or moderately selective institutions after high school compared to 6.5% and 16.1% of FGCs (a 23.9-percentage point and 14.3-percentage point gap, respectively). 17.8% of non-FGCs reported enrolling in a two-year institution compared to 29.8% of FGCs (a 12-perecntage point difference). Additionally, 9% of non-FGCs reported not enrolling in college after high school compared to 31.6% of FGCs (a 22.6-percentage point gap).

Table 19

Differences in College Enrollment Selectivity Level by College Generation Status

	Non-First Gen College Students (1) *n* = 6,190		First-Gen College Students (2) *n* = 7,280		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Highly selective	.304	.006	.065	.007	-.239***
Moderately selective	.304	.007	.161	.009	-.143***
Non-selective	.056	.004	.051	.005	-.005
Two-year	.178	.007	.298	.009	.120***
Not assigned	.064	.005	.103	.006	.039***
Not in school	.090	.007	.316	.009	.226***

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Relationship Among College Counseling Supports and College Selectivity Level for FGCs

To address the second research question, multinomial logistic regressions (MLRs) were used to better understand the relationship between college counseling support and college enrollment selectivity level. The analyses accounted for the control variables listed in Table 9. The analyses found that for FGCs who had access to counselors who spent at least 20% of their time on college counseling, the relative risk for enrolling in a moderately selective institution as opposed to not enrolling in college increased by a factor of 1.829 when controlling for individual, school, and counselor background variables (Table 20). For FGCs whose schools hosted college fairs, the relative risk for enrolling at a non-selective institution as opposed to not enrolling in college increased by a factor of 3.195. Additionally, for FGCs whose schools hosted college representative visits, the relative risk for enrolling at a two-year institution or moderately selective institution increased by a factor of 3.619 or 4.078, respectively. Interestingly, the analysis also found that for FGC students who had access to financial aid information, the relative risk for enrolling at a two-year institution or highly selective institution (compared to not enrolling in college) decreased by a factor of .287 and .308, respectively.

Additional analyses were used to predict the effect of college counseling support on FGC highly selective institution enrollment (Table 21). The analyses were run with the control variables listed in Table 9 held at their means. The results of the analyses found that the probability of an FGC enrolling in a highly selective institution was 5.7% when they had access to counseling departments that spent at least 20% of their time on college counseling compared to 4.4% for FGCs who did not. For a 10% increase in counselor caseload, the predicted probability of an FGC enrolling at a highly selective institution decreased by 10.9 percentage points. The predicted probability for an FGC to enroll at a highly selective institution was 4.6%

for those whose schools hosted college fairs compared to 3.1% for those FGCs without access to college fairs. Additionally, for FGCs that attended schools that offered additional high school to college transitional support, the predicted probability of enrolling at a highly selective institution was 5.5% compared to 4.0% for those without access to additional college transition support.

The predicted probability of an FGC enrolling at a highly selective institution decreased with access to a dedicated college counselor. For FGCs with access to a college counselor, the predicted probability was 4.3% compared to 5.8% for those without a dedicated college counselor. For FGCs with access to financial aid information, the predicted probability of enrolling at a highly selective institution was 3.0% compared to 4.6% for those without access to financial aid information.

Table 20

College Counseling Relationship to College Enrollment Selectivity Level (n = 9,860)

	Two-Year		Non-Selective		Moderately Selective		Highly Selective	
	RRR	(S.E.)	RRR	(S.E.)	RRR	(S.E.)	RRR	(S.E.)
Counselor caseload	1.085	(.364)	.557	(.198)	.786	(.254)	.583	(.197)
First-generation college (FGC) student	15.749	(36.349)	3.283	(8.358)	25.625	(60.141)	70.637	(178.876)
Counselor caseload x FGC	.608	(.240)	.804	(.351)	.534	(.213)	.448	(.194)
Dedicated college counselor	.845	(.183)	1.147	(.323)	.850	(.177)	.698	(.156)
First-generation college (FGC) student	.751	(.167)	.988	(.311)	.552**	(.128)	.643	(.173)
Dedicated college counselor x FGC	1.266	(.328)	.852	(.289)	1.329	(.346)	1.005	(.332)
College counseling goal	.956	(.203)	1.007	(.272)	.927	(.189)	.992	(.214)
First-generation college (FGC) student	.806	(.161)	.880	(.271)	.638*	(.140)	.581*	(.142)
College counseling goal x FGC	1.081	(.275)	1.000	(.335)	1.037	(.265)	1.238	(.394)
College counseling time	1.157	(.248)	1.060	(.286)	1.289	(.265)	1.792**	(.393)
First-generation college (FGC) student	.742	(.146)	.789	(.220)	.475***	(.092)	.618*	(.148)
College counseling time x FGC	1.268	(.323)	1.442	(.477)	1.829*	(.465)	1.129	(.365)
Postsecondary plan required	.827	(.217)	1.292	(.406)	.897	(.234)	.776	(.210)
First-generation college (FGC) student	.775	(.242)	1.353	(.556)	.497*	(.159)	.471*	(.165)
Postsecondary plan required x FGC	1.071	(.356)	.584	(.242)	1.367	(.456)	1.479	(.559)
College fairs offered	.966	(.360)	.684	(.309)	.986	(.345)	1.013	(.369)
First-generation college (FGC) student	.907	(.413)	.295*	(.171)	.368*	(.163)	.443	(.242)
College fairs offered x FGC	.914	(.423)	3.195†	(1.890)	1.809	(.815)	1.483	(.817)
College representative visits	.348*	(.183)	.635	(.403)	.675	(.358)	.599	(.328)
First-generation college (FGC) student	.244*	(.152)	.279	(.246)	.165*	(.115)	.190*	(.147)
College representative visits x FGC	3.619*	(2.258)	3.275	(2.872)	4.078*	(2.868)	3.519	(2.740)
College visits	.994	(.216)	1.048	(.288)	1.096	(.229)	.906	(.201)
First-generation college (FGC) student	.900	(.208)	.714	(.248)	.647†	(.149)	.459**	(.124)
College visits x FGC	.876	(.232)	1.348	(.488)	.980	(.259)	1.680	(.549)
College prep programs	.827	(.181)	.874	(.243)	.729	(.152)	.735	(.165)
First-generation college (FGC) student	.696†	(.133)	.831	(.231)	.554**	(.108)	.556**	(.122)

College prep programs x FGC	1.384	(.133)	1.117	(.384)	1.377	(.351)	1.325	(.428)
Information sessions	.761	(.239)	.737	(.315)	.978	(.303)	.975	(.314)
First-generation college (FGC) student	.755	(.238)	.890	(.381)	.566†	(.186)	.623	(.221)
Information sessions x FGC	1.193	(.393)	.982	(.431)	1.170	(.392)	1.064	(.404)
Financial aid	1.708	(.854)	.890	(.510)	1.189	(.577)	1.372	(.665)
First-generation college (FGC) student	.886	(.143)	.911	(.212)	.670*	(.119)	.677*	(.129)
Financial aid x FGC	.287*	(.164)	.448	(.324)	.460	(.271)	.308†	(.195)
Counseling curriculum	1.198	(.268)	1.182	(.225)	.956	(.208)	1.051	(.245)
First-generation college (FGC) student	.920	(.216)	1.031	(.327)	.512**	(.123)	.603†	(.168)
Counseling curriculum x FGC	.853	(.225)	.775	(.273)	1.404	(.372)	1.095	(.360)
College transition	1.222	(.263)	1.275	(.348)	1.152	(.237)	1.288	(.282)
First-generation college (FGC) student	.828	(.154)	.918	(.243)	.669*	(.133)	.596*	(.130)
College transition x FGC	1.002	(.260)	.882	(.299)	.892	(.236)	1.195	(.412)

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; RRR = relative risk ratio; S.E. = Robust standard error. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 21

Predicted Probability of Enrolling in a Highly Selective Institution for FGCs with Access to College Counseling Support (*n* = 9,860)

	Without College Counseling Support (1)		With College Counseling Support (2)		Diff (2-1)
	Predicted Probability	S.E.	Predicted Probability	S.E.	
Counselor caseload	.774**	(.266)	.665*	(.278)	-.109
Dedicated college counselor	.058***	(.010)	.043***	(.006)	-.015
College prep counseling goal	.045***	(.006)	.053***	(.008)	.008
College prep counseling time	.044***	(.006)	.057***	(.009)	.013
Postsecondary plan required	.043***	(.008)	.051***	(.006)	.008
College fairs offered	.031**	(.012)	.046***	(.005)	.015
College representative visits	.033†	(.018)	.046***	(.005)	.013
College visits	.036***	(.006)	.050***	(.007)	.014
College prep program	.046***	(.006)	.044***	(.008)	-.002
Information sessions	.051***	(.012)	.051***	(.006)	0.000
Financial aid	.046***	(.005)	.030**	(.011)	-.016
Counseling curriculum	.045***	(.007)	.045***	(.006)	0.000
College transition	.040***	(.005)	.055***	(.011)	0.015

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.E. = Standard error. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Discussion

Previous research has shown that college retention and graduation rates as well as lifetime income and wealth accumulation can be impacted by the type of postsecondary institution one attends (Bowen & Bok, 1998; Carnevale & Rose, 2004). However, FGCs are less

likely to enroll in highly selective institutions that offer better postgraduate and lifetime outcomes. This study confirms previous research that students from underrepresented backgrounds are less likely to attend highly selective institutions when compared to their White and non-FGC counterparts. The results which show that FGCs are 23.9-percentage points and 14.3-percentage points less likely than non-FGCs to attend highly and moderately selective institutions, respectively, could be contributing to larger postgraduate income and lifetime earnings gaps that continue to persist among FGCs and non-FGCs.

Like results from Studies 1 & 2, the results of Study 3 indicate that counseling departments that dedicated more of their time to college counseling saw increased relative risk for FGCs to enroll in moderately selective institutions. College support resources offered by the schools such as college fairs or college representative visits saw increased relative risk for enrolling at two-year, non-selective, and moderately selective institution. However, the analyses provided no significant results for FGC enrollment at highly selective institutions. When analyzing the predicted probability of an FGC with access to college counseling support compared to FGCs without access to those supports, the analyses found that college counseling may positively impact highly selective institution enrollment outcomes for FGCs. The results of the analyses show that increasing counseling department time spent on college counseling and decreasing counselor caseloads, may increase FGC enrollment at highly selective institutions. The results of the analyses indicate once again that time and dedication to college counseling by the counseling department can be the most meaningful approach in encouraging students to enroll at highly selective institutions. On the other hand, the results of the MLRs show that while college support resources, such as college fairs and college representative visits, may

improve overall college enrollment outcomes, they are less likely to improve FGC enrollment outcomes at highly selective institutions.

Finally, consistent with the two previous studies the analyses suggest that access to financial aid information does not positively impact college enrollment outcomes. More selective institutions tend to have a higher "sticker price" than two-year and non-selective institutions. Given that FGCs students are also often members of low-income families, they might be particularly sensitive to the growing cost of higher education, and ultimately less likely to enroll at highly selective institutions to avoid the higher cost. Previous research has indicated that low-income and FGCs may choose to undermatch after considering the cost-benefit of enrolling in a less selective institution (Blau & Duncan, 1967; Jez, 2014). The results of this study suggest that even with access to college counselors who can explain the long-term benefit of attending a highly selective institution, FGCs are potentially still sensitive to the cost of higher education. Further research is needed to better understand the relationship between postsecondary education costs and enrollment outcomes for FGCs when accounting for individual, school, and counselor variables.

Limitations

The primary limitation of this study relates to whether a student accessed college counseling resources and enrolled in college preparatory courses. While the study limits the population to only those students who had access to college preparatory courses at their schools, it does not take into consideration whether those students ultimately enrolled in college prep courses. In order to maintain an adequate sample size and to keep the control variables for the analyses limited to data take from the base-year survey, I made the decision not to limit the population to only those FGCs who enrolled in college preparatory coursework. Future research

could provide more robust insight into undermatching of FGCs by limiting the sample to only students who completed a college preparatory curriculum while in high school.

Additionally, though this study examines the impact of access to college counseling resources at the high school on college enrollment selectivity level, I am not able to limit the sample to only those students who *actually* accessed these college counseling resources. A limitation of using any secondary dataset is that one loses control over the questions asked and must work with the data presented. Additional student-level questions targeting the types of college counseling support students took advantage of at their high schools would provide additional insight. This study's results could be made more robust by including data only from those students who utilized one or more of the college counseling resources.

This study contributes to the literature on FGC enrollment at highly selective institutions in several ways. First, the study confirms previous research that FGCs are less likely to enroll in highly or moderately selective institutions after high school and, even when controlling for opportunity to access college preparatory courses, are more likely to attend two-year institutions or not enroll in postsecondary education. The differences in postsecondary education enrollment may be contributing to overall income and lifetime earnings gaps between FGCs and non-FGCs. Additionally, the results provide national evidence that undermatching by FGCs may be counteracted by counseling departments that focus on offering college counseling support and resources. Like the results of studies 1 and 2, the findings of Study 3 demonstrate that increased prioritization and funding of college counseling at high schools could positively impact the college enrollment outcomes of FGCs.

CHAPTER 5

Conclusion

There has been significant literature examining the impact that a college degree has on wage and lifetime earnings gaps. First-generation college students are less likely to attend college and those that do are more likely to enroll in less selective institutions that provide lower levels of return on investment. College counselors can act as influential others during the college pathways of FGC high school students by increasing their college aspirations, preparation, and enrollment selectivity levels. The purpose of the three interrelated studies in this dissertation was to examine the impact of college counseling support on FGCs at each of these stages of the college pathway.

Areas for Future Research

While the three studies in this dissertation focused on college counseling supports available to students, as reported by the head school counselor, it does not take into consideration whether students accessed these resources and used them during high school. Research that focuses on college counseling support as reported by the student instead of the counselor would assist in better understanding the impact of these supports. Both quantitative and qualitative studies could provide interesting additional insight into whether FGCs feel comfortable accessing college counseling resources at their schools and whether utilizing the resources relate to higher 11th-grade college aspirations and college enrollment outcomes. Additionally, the addition of academic counseling variables might better inform the impact of college counseling on the academic preparation of FGCs and ultimate college enrollment outcomes. In conclusion, while the three interrelated studies in this dissertation contribute to the literation by providing nationally, representative empirical research that shows that access to college counseling support

can increase the college aspirations, preparation, and enrollment of FGCs, additional research is needed to investigate the impact of accessing those resources on college aspiration, preparation, and enrollment outcomes.

Implications for Policy and Practice

The results of the studies confirmed that college counselors can positively influence college enrollment outcomes of FGCs at each stage of the college pathway. However, the results also made clear that not all college counseling support is created equal in terms of influencing college enrollment outcomes. The results of the studies consistently found that college preparation programs hosted by the school's counseling department do not have meaningful impact on increasing FGC student college aspirations, preparation, and enrollment outcomes. Hosting programs such as college fairs, college representative visits, college visits, and college information sessions had little impact on increasing college aspirations, preparation, or highly selective institution enrollment for FGCs. These programs are usually considered stand-alone events that do not require consistent discussion about postsecondary plans and therefore do not work to change the overall college-going culture of the high school environment and specifically among FGCs. For example, a school might host two college fairs per year (once in the fall and once in the spring). For each college fair, students will meet college representatives and learn about admission requirements. While these conversations can serve as a catalyst for encouraging FGCs to begin thinking about postsecondary education plans, without further engagement and conversations students may lose interest or become preoccupied with other responsibilities instead of continuing to educate themselves on college options. For these reasons, U.S. high school counseling departments should closely examine how the college preparation events and programs that they choose to host will further an overarching goal and plan for increasing

college-going trends among FGC populations. Counseling departments should think closely about the needs of their student population and building a counseling curriculum and programs to meet those needs and information gaps.

The results presented in this dissertation confirm previous research that FGCs are particularly sensitive to the cost of postsecondary education (Blau & Duncan, 1967; Jez, 2014). The results showed that introducing financial aid information can negatively impact college enrollment outcomes of FGCs. Honest conversations detailing financial aid and the increasing cost of higher education are vital for all high school students. However, one must be careful of not focusing so much on the rising cost of higher education that it makes pursuing postsecondary education seem unattainable for FGC students who are often from lower-income families. When introducing topics related to financial aid, well-educated counselors should be prepared to provide insight on not just rising sticker prices, but average the net price of a college education by institution type, varieties of need-based and merit-based financial aid options, and the complexities of the financial aid application process. Counselors should work to involve parents and guardians in these conversations as parents have a real financial interest in better understanding college costs and research has shown that parents are the largest influence on the college-going process for all students (Eccles et al., 2004; Engberg & Wolniak, 2001).

Most importantly, the results of the three studies did consistently show that an increased intentional focus on college counseling by the high school's counseling department can make meaningful impact on the college aspirations, preparation, and enrollment of FGCs. Counseling departments that spent at least 20% of their time on college counseling or hired a counselor whose time was dedicated to college counseling saw more positive college aspiration and enrollment results for FGCs. Unfortunately allowing for more time dedicated to college

counseling and/or hiring a dedicated college counselor requires increased funding and prioritization of counseling department budgetary needs for U.S. high schools. It is easier to advocate for funding an annual or bi-annual college fair or college visit, but we know that these types of college support resources don't see meaningful impacts. It is more expensive to invest in college counseling personnel. However, state and district level education officials who aim to decrease the education and college enrollment gaps between FGCs and non-FGCs will need to advocate for increased funding allocations for schools to maintain sufficient staffing levels so that they have the time available to dedicate to college counseling.

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Table 22

Difference in Characteristics by College Generation Status

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Demographics					
Female	.506	.007	.512	.009	.006
White	.677	.007	.470	.008	-.207***
Asian	.059	.002	.020	.003	-.039***
Black	.076	.004	.148	.006	.072***
Hispanic	.106	.005	.271	.007	.165***
Multiracial	.075	.004	.077	.005	.002
Other race	.008	.001	.015	.002	.007***
Socioeconomic status	.733	.007	-.470	.009	-1.203***
High School Characteristics					
City	.305	.006	.315	.008	.010
Suburb	.384	.006	.304	.008	-.080***
Rural	.222	.006	.246	.007	.024**
Town	.089	.004	.135	.005	.046***
Public	.795	.004	.910	.006	.115***
Private	.148	.003	.035	.004	-.113***

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 23

Differential Effects of College Aspirations in Early High School on Four-Year College Enrollment Outcomes by College Generation Status with Covariates (n = 11,470)

	Model 1		Model 2	
	β	(S.E.)	β	(S.E.)
9th-grade high aspirations	.126***	(.016)	.138***	(.020)
First-generation college (FGC) student	-.064**	(.019)	-.049†	(.026)
9th-grade high aspirations x FGC			-.026	(.027)
11th-grade high aspirations	.241***	(.014)	.232***	(.020)
First-generation college (FGC) student	-.055**	(.018)	-.058**	(.024)
11th-grade high aspirations x FGC			.005	(.026)

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 24

Differences in Educational Aspirations and Four-Year College Enrollment by College Generation Status

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Educational Aspirations					
9th grade high aspirations	.660	.019	.635	.011	-.025**
11th grade high aspirations	.686	.022	.634	.012	-.052***
College Enrollment					
Not in school	.214	.020	.218	.011	.004
2-year college	.378	.022	.444	.013	.066***
4-year college	.408	.021	.338	.012	-.070***

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 25

Covariates for 9th and 11th Grade College Aspirations Regression Models

	9th Grade High College Aspirations *n* = 17,730		11th Grade High College Aspirations *n* = 12,740	
	Mean	S.D.	Mean	S.D.
FGC	-.025*	.011	-.053***	.012
FGC - missing	-.104***	.011	-.085***	.013
Female	.030***	.007	.051***	.008
Black	.065***	.012	.072***	.013
Asian	-063**	.019	-.020	.022
Hispanic	-.037***	.010	-.028*	.011
Multi-race	.027*	.013	-.012	.015
Other race	-.138***	.032	-.053	.036
Socioeconomic status (SES)	.056***	.007	.054***	.008
Parental educational expectations	-.175***	.011	-.212***	.012
Math achievement	.090***	.004	.102***	.005
Ability to earn a bachelor's	-.462***	.013	-.271***	.015
Ability to earn a BA - missing	-.149***	.032	-.175***	.038
Sure s/he will enroll in college	.573***	.041	-.006	.056
Sure s/he will enroll in college - missing	.213***	.036	.045	.041
City	-.006	.009	-.005	.010
Town	-.012	.012	-.017	.014
Rural	.006	.009	.005	.011
Private	.002	.014	.011	.017
% of students enrolled in AP courses	.001*	.000	.001***	.000
% of students enrolled in AP courses – missing	-.037†	.021	-.030	.024
% of students attending four-year colleges	.000	.000	.000†	.000
% of students attending four-year colleges – missing	.012	.013	-.006	.015
% of students on free/reduced lunch	.013	.009	-.010*	.010
% of students on free/reduced lunch missing	.049†	.028	-.010	.032
Student body is less than 10% Asian	-.014	.012	.013	.014
Student body is less than 10% Asian – missing	.132†	.071	.202*	.083
Student body is less than 40% white	.001*	.010	.025*	.012
Student body is less than 40% white – missing	-.153	.075	-.125	.088
Counselor Years of Experience	-.001	.001	-.000	.001
Counselor Years of Experience - missing	.023	.015	.016	.017
Counselor degree level	.044	.057	-.135*	.065
Counselor degree level - missing	-.046**	.017	-.054**	.020

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 26

Covariates for College Enrollment Regression Model (n = 12,660)

	Not in School		2-year college		4-year college	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	.004	.011	.066**	.013	-.070***	.012
FGC - missing	.135***	.012	.024†	.013	-.159***	.013
Female	-.062***	.007	-.008	.008	.069***	.007
Black	-.009	.012	-.031*	.013	.040**	.013
Asian	-.057**	.020	.010	.022	.047*	.021
Hispanic	-.038***	.011	.069***	.012	-.031**	.011
Multi-race	.002	.013	.043**	.015	-.044**	.014
Other race	.108**	.033	-.084*	.037	-.024	.035
Socioeconomic status (SES)	-.087***	.007	-.020*	.008	.106***	.008
Parental educational expectations	.201***	.011	-.014	.013	-.187***	.012
Math achievement	-.076***	.004	-.063***	.005	.138***	.005
Ability to earn a bachelor's	.229***	.014	-.101***	.015	-.129***	.015
Ability to earn a BA missing	.135***	.036	-.084*	.040	-.051	.038
Sure s/he will enroll in college	.051	.051	.028	.057	-.079	.054
Sure s/he will enroll in college - missing	.003	.038	-.026	.042	.023	.040
City	-.003	.009	.038***	.010	-.035***	.010
Town	.019	.013	-.006	.014	-.013	.013
Rural	.008	.010	.014	.011	-.023*	.010
Private	-.055***	.015	-.061***	.017	.116***	.016
% of students enrolled in AP courses	.000	.000	-.000	.000	.000	.000
% of students enrolled in AP courses - missing	.066**	.022	-.053*	.025	-.013	.024
% of students attending four-year colleges	-.001*	.000	-.002***	.000	.002***	.000
% of students attending four-year colleges - missing	-.020	.014	-.083***	.015	.103***	.014
% of students on free/reduced lunch	.042***	.009	-.041***	.010	-.001	.010
% of students on free/reduced lunch - missing	-.042	.029	.055†	.033	-.013	.031
Student body is less than 10% Asian	.007	.012	-.055***	.014	.048***	.013
Student body is less than 10% Asian – missing	.130†	.076	-.104	.085	-.027	.081
Student body is less than 40% white	-.017	.011	.037**	.012	-.021†	.011
Student body is less than 40% white – missing	-.110	.080	.032	.090	.078	.086
Counselor Years of Experience	.001	.001	.001	.001	-.002**	.001
Counselor Years of Experience – missing	.010	.016	.014	.018	-.024	.017
Counselor degree level	.005	.019	-.059	.067	.049	.063

Counselor degree level - missing	.214	.020	.015	.021	-.020	.020

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 27

Differences in Access to College Counseling Support by College Generation Status with Covariates

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Counselor caseload	461.237	5.673	465.215	3.138	3.978
Dedicated college counselor	.526	.022	.535	.012	.009
College prep counseling goal	.360	.022	.338	.012	-.022†
College prep counseling time	.119	.022	.136	.012	.017
Postsecondary plan required	.703	.018	.724	.010	.021*
College fairs offered	.860	.012	.888	.007	.028***
College representative visits	.897	.009	.909	.005	.012*
College visits	.589	.021	.606	.011	.017
College prep program	.324	.021	.364	.011	.040***
Information sessions	.858	.010	.869	.006	.011*
Financial aid	.052	.009	.044	.005	-.008
Counseling curriculum	.494	.021	.480	.012	-.014
College transition	.348	.022	.330	.012	.018

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 28

College Counseling Support Regression Models with Covariates

	Counselor Caseload (*n* = 16,160)		Dedicated College Counselor (*n* = 16,070)		College Counseling Goal (*n* = 16,120)		College Counseling Time (*n* = 15,970)		Postsecondary Plan Required (*n* =16,140)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	3.988	3.138	.009	.012	-.022†	.012	.017	.012	.021*	.010
FGC - missing	5.381	3.279	-.007	.013	-.015	.013	.003	.013	.023*	.010
Female	.997	1.960	.001	.008	.016*	.008	.007	.007	.012*	.006
Black	-1.980	3.388	.054***	.013	-.040**	.013	.056***	.013	.051***	.010
Asian	30.677***	5.631	-.019	.022	.037†	.022	.026	.022	-.014	.017
Hispanic	29.204***	2.940	037**	.011	-.069***	.011	-.026*	.011	.012	.009
Multi-race	10.192**	3.777	-.021	.015	.012	.015	-.044**	.014	.017	.012
Other race	41.202***	9.024	.091*	.036	-.080*	.035	-.054	.034	-.015	.028
Socioeconomic status (SES)	-1.202	2.011	.010	.008	.001	.008	.019*	.008	-.005	.006
Parental educational expectations	-.131	3.200	-.025*	.012	-.028*	.012	-.023†	.012	-.005	.010
Math achievement	2.536*	1.221	.004	.005	-.004	.005	-.004	.005	-.012**	.004
Ability to earn a bachelor's	-10.118**	3.823	-.051**	.015	.063***	.015	.002	.015	-.009	.012
Ability to earn a BA - missing	-11.790	9.741	.038	.038	-.029	.037	-.044	.038	.056†	.030
Sure s/he will enroll in college	3.727	12.210	-.058	.047	.029	.047	.074	.047	.036	.038
Sure s/he will enroll in college - missing	-9.483	10.596	-.011	.041	.005	.041	.067	.041	.022	.033
City	-11.536***	2.607	-.023	.010	-.010	.010	-.055***	.010	-.068***	.008
Town	-9.050**	3.466	.052***	.014	-.057***	.013	-.041**	.013	-.029**	.011
Rural	-3.100	2.684	.041***	.010	.100***	.010	-.025*	.010	.049***	.008
Private	-152.636***	4.305	.377***	.017	.083***	.017	.081***	.016	-.106***	.013
% of students enrolled in AP courses	.494***	.085	.002***	.000	.004***	.000	.001***	.000	.001***	.000
% of students enrolled in AP courses - missing	43.064***	6.923	-.164***	027	.120***	.027	-.015	.026	.035	.021
% of students attending four-year colleges	-.809***	.056	-.000	.000	.004***	.000	.006***	.000	.000	.000
% of students attending four-year colleges - missing	-3.724	3.824	-.005	.015	.062***	.015	.313***	.015	.033**	.012
% of students on free/reduced lunch	-18.914***	2.558	.086***	.010	.003	.010	-.008	.010	.148***	.008
% of students on free/reduced lunch missing	-53.486***	8.286	.049	.032	-.080*	.032	-.230***	.031	-.010	.026
Student body is less than 10% Asian	-67.029***	3.685	-.034*	.014	-.124***	.014	.053***	.014	-.013	.011
Student body is less than 10% Asian – missing	-58.273**	19.880	.414***	.077	.414***	.076	-.238**	.075	.214**	.061
Student body is less than 40% white	10.876***	3.00	-.036**	.012	.001	.012	-.031**	.011	.030**	.009
Student body is less than 40% white – missing	-13.367	21.121	-.328***	.082	-.479***	.081	.655***	.080	-.241***	.065
Counselor Years of Experience	.281†	.145	-.000	.001	.001*	.001	-.002***	.001	-.001	.000
Counselor Years of Experience - missing	20.227***	4.197	-.090***	.016	-.009	.016	.001	.016	.037**	.013
Counselor degree level	-42.880**	15.943	.351***	.062	.471***	.061	.554***	.060	-.550***	.049
Counselor degree level - missing	-4.164	12.955			-.079	050	-.064	.049	.120**	.040

	College Fairs (*n* = 16,090)		College Representative Visits (*n* = 16,090)		College Visits (*n* = 16,090)		College Prep Programs (*n* = 16,090)		Information Sessions (*n* =17,730)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	.028***	.007	.012*	.005	.017	.011	.040***	.011	.011*	.006
FGC - missing	.022**	.007	.014*	.005	.020†	.012	.047***	.012	.017**	.006
Female	.000	.004	.001	.003	.008	.007	004	.007	.006†	.004
Black	-.004	.007	-.059***	.006	.034**	.012	.025*	.012	-.034***	.006
Asian	-.029*	.012	.004	.009	.012	.021	.045*	.020	-.023*	.010
Hispanic	.041***	.006	-.003	.005	.016	.011	.067***	.011	-.005	.005
Multi-race	.011	.008	-.018**	.006	.006	.014	.035*	.014	-.011	.007
Other race	.068***	.019	.018	.015	.078*	.033	.119***	.033	.041*	.017
Socioeconomic status (SES)	.019***	.004	.009**	.003	-.020**	.007	-.008	.007	.007†	.004
Parental educational expectations	-.008	.007	-.015**	.005	-.005	.012	-.009	.012	.002	.006
Math achievement	.009***	.003	-.006**	.002	-.011*	.004	-.021***	.004	.004*	.002
Ability to earn a bachelor's	-.020*	.008	-.052	.006	-.023†	.014	-.023†	.014	-.006	.007
Ability to earn a BA - missing	.010	.021	-.043**	.016	.103**	.035	.006	.035	.052**	.017
Sure s/he will enroll in college	-.039	.026	.003	.020	.011	.044	.028	.044	.038†	.022
Sure s/he will enroll in college - missing	-.020	.023	.020	.017	-.032	.039	-.007	.038	-.021	.019
City	.073***	.006	.052***	.004	-.008	.010	.153***	.009	.045***	.004
Town	.036***	.007	.054***	.006	-.001	.013	.014	.013	-.011†	.006
Rural	.047***	.006	.037***	.004	.008	.010	-.023*	.010	.021***	.005
Private	-.068***	.009	-.023**	.007	.008	.016	-.303***	.016	-.026**	.008
% of students enrolled in AP courses	.000	.000	.001***	.000	-.002***	.000	-.001**	.000	-.000	.000
% of students enrolled in AP courses - missing	-.031*	.015	.015	.011	-.003	.025	-.002	.025	-.086***	.011
% of students attending four-year colleges	.000***	.000	.001***	.000	.000	.000	.000	.000	.000***	.000
% of students attending four-year colleges - missing	-.019*	.008	.015*	.006	.049***	.014	.036**	.014	.027***	.007
% of students on free/reduced lunch	.004	.005	.029***	.004	.140***	.009	.262***	.009	.019***	.005
% of students on free/reduced lunch missing	.041*	.018	.025†	.014	-.013	.030	.113***	.030	-.061***	.015
Student body is less than 10% Asian	.003	.008	-.033***	.006	.023†	.014	-.056***	.014	.024***	.006
Student body is less than 10% Asian – missing	.068	.042	.032	.032	.433***	.072	.630***	.072	.105**	.038
Student body is less than 40% white	.015*	.006	.005	.005	.074***	.011	.051***	.011	.039***	.006
Student body is less than 40% white – missing	-.049	.045	-.107**	.034	-.292***	.077	-.618***	.077	.086*	.041
Counselor Years of Experience	-.002***	.000	.001***	.000	-.003***	.001	.003***	.001	-.000	.000
Counselor Years of Experience - missing	.010	.009	.018**	.007	.000	.015	.022	.015	.015†	.008
Counselor degree level	-.034	.034	-.810***	.026	.275***	.058	-.363***	.058	-.047	.031
Counselor degree level - missing	.023	.036	-.024	.027	.125*	.061	-.945***	.061	-.914***	.009

	Financial Aid (*n* = 16,090)		College Prep Curriculum (*n* = 16,090)		College Transition (*n* = 16,090)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	-.008	.005	-.014	.012	-.018	.012
FGC - missing	-.011*	.005	-.018	.012	-.023†	.012
Female	-.004	.003	.008	.007	.005	.007
Black	-.008	.005	.012	.013	.002	.013
Asian	.003	.009	-.024	.021	-.012	.021
Hispanic	-.018***	.005	.031**	.011	.039**	.011
Multi-race	-.009	.006	.033*	.014	.008	.014
Other race	-.008	.014	.112**	.034	.178***	.034
Socioeconomic status (SES)	.001	.003	-.007	.008	-.009	.008
Parental educational expectations	-.004	.005	-.022†	.012	-.033**	.012
Math achievement	-.004*	.002	-.005	.005	.006	.005
Ability to earn a bachelor's	.003	.006	-.016	.014	-.001	.015
Ability to earn a BA - missing	-.014	015	.068†	.036	-.022	.037
Sure s/he will enroll in college	-.010	.019	.015	.046	-.172***	.046
Sure s/he will enroll in college - missing	-.013	.016	.000	.040	-.020	.040
City	-.031***	.004	-.031**	.010	.001	.010
Town	-.050***	.005	-.131***	.013	-.100***	.013
Rural	-.030***	.004	-.135***	.010	-.051***	.010
Private	.075***	.007	.111***	.016	.091***	.016
% of students enrolled in AP courses	.001***	.000	.003***	.000	-.001**	.000
% of students enrolled in AP courses - missing	.155***	.011	-.032	.026	.005	.026
% of students attending four-year colleges	.000	.000	-.000	.000	.001**	.000
% of students attending four-year colleges - missing	-.012†	.006	-.071***	.014	-.169***	.015
% of students on free/reduced lunch	-.003	.004	-.008	.010	-.004	.010
% of students on free/reduced lunch missing	.067***	.013	.112***	.031	.050	.032
Student body is less than 10% Asian	.011†	.006	.198***	.014	.095***	.014
Student body is less than 10% Asian – missing	-.011	.031	-.385***	.074	-.306***	.076
Student body is less than 40% white	-.031***	.005	.067***	.011	.005	.011
Student body is less than 40% white – missing	-.201***	.033	.616***	.079	.328***	.080
Counselor Years of Experience	-.000	.000	.001	.001	.000	.001
Counselor Years of Experience - missing	.129***	.006	.015	.016	-.170***	.016
Counselor degree level	.057*	.025	-.571***	.059	-.072	.061
Counselor degree level - missing	.907***	.026	.498***	.062	-.031	063

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 29

Differences in College Prep Course Offerings by College Generation Status with Covariates

	Non-First Gen College Students (1) (*n* = 6,530)		First-Gen College Students (2) (*n* = 7,730)		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
AP courses offered	.804	.012	.792	.007	-.012†
IB courses offered	.048	.012	.043	.007	-.005
College prep courses offered	.810	.012	.803	.007	-.007

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 30

Covariates for College Prep Course Offerings Regression Model

	AP Courses Offered (n = 16,740)		IB Courses Offered (n = 15,280)		College Prep Course Offered (n = 17,730)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	-.012†	.007	-.005	.007	-.007	.007
FGC - missing	-.025***	.007	.011	.007	-.012†	.007
Female	-.008*	.004	.006	.004	-.001	.004
Black	.003	.007	.015*	.008	-.011	.007
Asian	.016	.012	.036**	.012	.008	.012
Hispanic	.012†	.006	.011†	.006	.018**	.006
Multi-race	.015†	.008	.004	.008	.008	.008
Other race	.040*	.020	-.003	.019	.027	.020
Socioeconomic status (SES)	-.002	.004	-.004	.004	-.001	.004
Parental educational expectations	-.001	.007	.015*	.007	.006	.007
Math achievement	-.006*	.003	.008**	.003	-.007**	.003
Ability to earn a bachelor's	-.026**	.008	.008	.008	-.017	.008
Ability to earn a BA - missing	.037†	.020	-.026	.019	.036†	.020
Sure s/he will enroll in college	.004	.026	.001	.025	-.004	.026
Sure s/he will enroll in college - missing	.006	.022	-.015	.022	.001	.022
City	-.036***	.006	.025***	.006	-.059***	.005
Town	-.031***	.007	-.054***	.007	-.044***	.008
Rural	-.088***	.006	-.055***	.006	-.118***	.006
Private	-.116***	.009	-.073***	.009	-.110***	.009
% of students enrolled in AP courses	.006***	.000	.002***	.000	.006***	.000
% of students enrolled in AP courses - missing	-.020	.013	.020	.012	-.002	.013
% of students attending four-year colleges	.000***	.000	-.000*	.000	.001***	.000
% of students attending four-year colleges - missing	.009	.008	.001	.008	.016*	.008
% of students on free/reduced lunch	-.005	.005	-.021***	.005	-.003	.006
% of students on free/reduced lunch - missing	.058**	.018	-.048**	.017	-.123***	.018
Student body is less than 10% Asian	.009	.007	.023**	.007	.010	.007
Student body is less than 10% Asian – missing	.209***	.043	-.028	.041	.218***	.044
Student body is less than 40% white	.039***	.006	.001	.006	.045***	.006
Student body is less than 40% white – missing	-.126**	.047	.052	.045	-.657***	.047
Counselor Years of Experience	.002***	.000	.002***	.000	.002***	.000
Counselor Years of Experience – missing	.084***	.009	-.041***	.009	.088***	.009

Counselor degree level	-.078*	034	-.052	.033	-.087*	.036
Counselor degree level - missing	-.030**	.011	.019†	.011	-.048***	.011

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 31

Differences in College Prep Course Aspirations and College Prep Course Enrollment by College Generation Status with Covariates

	Non-First Gen College Students (1) *n* = 6,530		First-Gen College Students (2) *n* = 7,730		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Advanced course aspirations					
AP course aspirations	.311	.021	.305	.012	-.006
IB course aspirations	.156	.015	.149	.009	-.007
College prep course aspirations	.323	.021	.317	.012	-.006
Advanced course enrollment					
AP course enrollment	.305	.022	.280	.012	-.025*
IB course enrollment	.004	.008	-.002	.004	-.006
College prep course enrollment	.286	.021	.253	.012	-.033**

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 32

Covariates for College Prep Course Aspirations Regression Model

	AP Course Aspirations (*n* = 14,520)		IB Course Aspirations (*n* = 14,440)		College Prep Course Aspirations (*n* = 15,120)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	-.006	.012	-.007	.009	-.006	.012
FGC - missing	-.061***	.013	-.028**	.009	-.063***	.012
Female	.021**	.008	-.028***	.005	.022**	.007
Black	.054***	.013	.043***	.010	.052***	.013
Asian	.060**	.021	.041**	.015	.047*	.021
Hispanic	.010	.011	-.002	.008	.005	.011
Multi-race	.023	.014	.042***	.010	.031*	.014
Other race	.006	.037	.018	.027	.030	.035
Socioeconomic status (SES)	.057***	.008	.011*	.006	.054***	.008
Parental educational expectations	-.065***	.012	-.005	.009	-.055***	.012
Math achievement	.107***	.005	.000	.003	.103***	.005
Ability to earn a bachelor's	-.186***	.015	-.098***	.011	-.193***	.015
Ability to earn a BA - missing	-.038	.041	-.086**	.030	-.174***	.034
Sure s/he will enroll in college	.038	.050	.030	.035	.055	.047
Sure s/he will enroll in college - missing	.162**	.050	.080*	.036	-.011	.038
City	.002	.010	-.018**	.007	.005	.010
Town	-.017	.014	-.030**	.010	-.024†	.013
Rural	.002	.011	-.009	.008	-.011	.010
Private	.015	.017	-.023†	.012	-.006	.016
% of students enrolled in AP courses	.002***	.000	.001***	.000	.003***	.000
% of students enrolled in AP courses - missing	.049*	.024	.038*	.017	.029	.023
% of students attending four-year colleges	.000	.000	-.000	.000	.000	.000
% of students attending four-year colleges - missing	-.025†	.015	-.005	.011	-.018	.014
% of students on free/reduced lunch	.022*	.010	.007	.007	.021*	.010
% of students on free/reduced lunch - missing	.064*	.032	.053*	.023	.074*	.031
Student body is less than 10% Asian	.008	.013	-.011	.009	.004	.013
Student body is less than 10% Asian – missing	-.236**	.073	.009	.053	-.158*	.073
Student body is less than 40% white	.051***	.011	.026**	.008	.052***	.011
Student body is less than 40% white – missing	.270**	.080	-.085	.058	.187*	.080
Counselor Years of Experience	-.003***	.001	-.001*	.000	-.003***	.001
Counselor Years of Experience – missing	-.017	.017	-.024*	.012	-.013*	.017
Counselor degree level	-.146*	.066	-.108*	.047	-.160	.066
Counselor degree level - missing	-.016	.019	-.016	.014	-.029	.019

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 33

Covariates for College Prep Course Enrollment Regression Model

	AP Course Enrollment (n = 12,240)		IB Course Enrollment (n = 12,240)		College Prep Course Enrollment (n = 12,980)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	-.025*	.012	-.006	.004	-.033**	.012
FGC - missing	-.070***	.013	-.006	.005	-.085***	.013
Female	.080***	.008	.002	.003	.074***	.007
Black	-.059***	.013	-.004	.005	-.060***	.013
Asian	.106***	.021	.008	.008	.120***	.020
Hispanic	.013	.011	-.006	.004	.015	.011
Multi-race	-.028†	.014	-.003	.005	-.030*	.014
Other race	-.082*	.036	-.016	.013	-.083*	.034
Socioeconomic status (SES)	.078***	.008	.003	.003	.080***	.007
Parental educational expectations	-.136***	.012	-.009*	.004	-.127***	.012
Math achievement	.182***	.005	.012***	.002	.177***	.005
Ability to earn a bachelor's	-.116***	.015	-.003	.006	-.111***	.014
Ability to earn a BA - missing	-.016	.036	.043**	.013	-.023	.034
Sure s/he will enroll in college	.078	.052	.007	.019	.092†	.050
Sure s/he will enroll in college - missing	.008	.040	-.045**	.014	.012	.038
City	.008	.010	.001	.004	.014	.009
Town	-.070***	.014	-.013**	.005	-.068***	.013
Rural	.003	.011	-.018***	.004	.001	.010
Private	-.008	.017	-.024***	.006	-.011	.016
% of students enrolled in AP courses	.004***	.000	.001***	.000	.004***	.000
% of students enrolled in AP courses - missing	.065**	.024	.013	.009	.059*	.023
% of students attending four-year colleges	.001*	.000	-.000	.000	.000†	.000
% of students attending four-year colleges - missing	-.001	.015	-.006	.005	-.006	.014
% of students on free/reduced lunch	-.001	.010	.019***	.004	-.000	.010
% of students on free/reduced lunch - missing	.082*	.032	.005	.012	.090**	.031
Student body is less than 10% Asian	.025†	.013	.006	.005	.040**	.012
Student body is less than 10% Asian – missing	-.172*	.077	.007	.027	-.172*	.071
Student body is less than 40% white	.071***	.011	.001	.004	.063***	.011
Student body is less than 40% white – missing	.061	.084	.003	.030	.092	.077
Counselor Years of Experience	-.002**	.001	-.000	.000	-.001*	.001
Counselor Years of Experience – missing	-.004	.017	-.014*	.006	-.014	.016
Counselor degree level	.304***	.069	-.018	.025	.316***	.069
Counselor degree level - missing	-.089***	.020	.012†	.007	-.068***	.019

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009.

†p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 34

Differences in College Enrollment Selectivity Level by College Generation Status with Covariates

	Non-First Gen College Students (1) (*n* = 6,190)		First-Gen College Students (2) (*n* = 7,280)		Diff (2)-(1)
	Mean	S.D.	Mean	S.D.	
Highly selective	.055	.017	.006	.009	-.049***
Moderately selective	.202	.021	.156	.012	-.046***
Non-selective	.080	.012	.088	.007	.008
Two-year	.394	.023	.446	.013	.052***
Not assigned	.065	.015	.092	.009	.027**
Not in school	.205	.021	.213	.012	.008

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Table 35

Covariates for College Enrollment Selectivity Level (n = 10,880)

	Highly Selective		Moderately Selective		Non-selective		Not Assigned	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
FGC	-.049***	.009	-.046***	.012	.008	.007	.027**	.009
FGC - missing	-.059***	.010	-.072***	.013	-.016*	.007	.008	.009
Female	.019**	.006	.041***	.008	-.004	.004	.036***	.005
Black	-.001	.010	.020	.013	.021**	.007	-.027**	.010
Asian	.083***	.016	-.060**	.021	.009	.012	-.004	.015
Hispanic	.006	.009	-.037**	.011	.007	.006	-.000	.008
Multi-race	-.049***	.011	-.033*	.014	.017*	.008	.057***	.010
Other race	.018	.027	-.047	.035	-.003	.019	-.015	.025
Socioeconomic status (SES)	.069***	.006	.024*	.008	.007	.004	.007	.006
Parental educational expectations	-.013	.009	-.114***	.012	-.036***	.007	-.005	.009
Math achievement	.103***	.004	.036***	.005	.008**	.003	-.024***	.003
Ability to earn a bachelor's	-.009	.012	-.080***	.015	-.026**	.008	.030	.011
Ability to earn a BA - missing	-.057*	.029	.013	.037	.021	.020	-.049†	.027
Sure s/he will enroll in college	-.028	.046	-.050	.059	-.027	.033	-.007	.043
Sure s/he will enroll in college - missing	.097**	.031	-.051	.040	-.024	.022	-.007	.029
City	.011	.008	.000	.010	-.008	.005	-.029***	.007
Town	-.017	.011	.038**	.014	-.001	.008	-.055***	.010
Rural	-.004	.008	.002	.011	.010†	.006	-.031***	.008
Private	.085***	.013	.001	.017	.025**	.009	.004	.012
% of students enrolled in AP courses	.001**	.000	-.001	.000	-.001**	.000	.000*	.000
% of students enrolled in AP courses - missing	.022	.019	-.014	.025	-.032*	.014	.024	.018
% of students attending four-year colleges	.002***	.000	.001***	.000	-.000†	.000	-.001***	.000
% of students attending four-year colleges - missing	.071***	.011	.054***	.015	-.019*	.008	-.027**	.011
% of students on free/reduced lunch	.007	.008	-.013	.010	.013*	.005	-.010	.007
% of students on free/reduced lunch - missing	.003	.025	-.049	.032	.071***	.018	-.002	.023
Student body is less than 10% Asian	.006	.010	.015	.013	-.001	.007	.050***	.009
Student body is less than 10% Asian – missing	-.074	.059	.113	.077	-.069	.042	.041	.055
Student body is less than 40% white	-.013	.009	-.013	.011	-.008	.006	.030***	.008

Student body is less than 40% white – missing	.083	.065	-.106	.083	.066	.046	.025	.060
Counselor Years of Experience	.000	.000	.000	.001	-.001**	.000	-.001**	.000
Counselor Years of Experience – missing	-.021	.013	.007	.017	-.015	.009	-.021†	.012
Counselor degree level	.089†	.054	.073	.070	-.043	.039	-.077	.050
Counselor degree level - missing	.036*	.015	-.029	.020	-.009	.011	.001	.014

Source. U.S. Department of Education, National Center for Education Statistics, High School Longitudinal Study of 2009 (HSLS:09).

Note. *n* = sample size; S.D. = Standard deviation; Diff = group differences. Data were weighted to be generalizable to the population of first-time 9th graders in the U.S. in the fall of 2009. †p<0.10, *p<0.05, **p<0.01, ***p<0.001

Appendix A

Variable Descriptions and Definitions

Category	Variable	Definition
Student Background		
	Sex	Student's sex taken from base-year survey. 0=Male (reference), 1=Female (X1SEX).
	Race/Ethnicity Composite	Dummy variables representing a student's race or ethnicity taken from base-year survey: Asian, Black, Hispanic, White (reference), Multiracial, and Other (X1RACE).
	Socioeconomic Status (SES)	Student's socioeconomic status. This is a composite variable calculated based on parent education level, occupation, and income (X1SES).
	First-Generation College Status	Highest level of education achieved by either parent. HSLS:09 variable was constructed from two composite variables (X1PAREDU). A dummy variable was created to differentiate between FGCs (neither parent has earned a Bachelor's degree) and non-FGCs.
Educational Expectations		
	9th Grade College Aspirations	Highest level of education student thinks s/he will achieve (X1STUEDEXPCT). A dummy variable was created to differentiate between high college aspirations (BA or higher) and low college aspirations (AA or lower).
	Parent's Educational Expectations	Highest level of education parent thinks student will achieve (X1PAREDEXPCT). A dummy variable was created to differentiate between high college aspirations (BA or higher) and low college aspirations (AA or lower).
Academic Achievement		
	9th Grade Academic Achievement	Continuous math theta score that represents student's ability. The theta score provides a norm-referenced measurement of achievement (X1TXMTH)
Self-Efficacy		
	Postsecondary Plans	Student is sure they will in enroll in college after high school (S1SURECLG).
	Confidence to Earn Bachelor's	Student is sure they will earn a Bachelor's degree (S1FYBA).
High School Characteristics		
	School Locale	The location and urbanicity of student's school (X1LOCALE).

School Type	Characterizes the type of school (e.g., public, Catholic, or other private) based on the Common Core of Data and the Private School Survey (A1SCHCONTROL).
Peer Racial/Ethnic Composition	Continuous variable that indicates the percentage of the student body at a school that identifies as Asian or White (X1SCHASIAN and X1SCHWHITE).
Peer Socioeconomic Composition	Continuous variable that indicates the percentage of the student body who receive free or reduced-price lunch (A1FREELUNCH).
Percentage of AP Enrolled Students	Continuous variable that indicates the percentage of the student body who enrolled in AP courses (A1AP).
Four-Year College Enrollment	Continuous variable that indicates the percentage of 08-09 seniors who enrolled at 4-year colleges (A14YRDEGREE)
Years of Experience	Years the counselor has been a school counselor (C1YRSK12).
College Degree	Highest degree earned by the counselor completing the survey (C1HIDEG).

Primary Independent Variables

Counselor Caseload	Continuous variable that indicates the average caseload of a school counselor at the school (C1CASELOAD)
Dedicated College Counselor	The school has a counselor dedicated to college preparation (C1CLGPREP).
College Prep Counseling Goal	School counseling program's most emphasized goal. A binary dummy variable was created for those school where the most emphasized goal was preparation for postsecondary schools (1=Yes; 0=No) (C1GOAL1).
College Prep Counseling Time	The amount of time the counseling department dedicates to college preparation. A binary dummy variable was created to indicate whether a counseling staff spends more than 20% of their time dedicated to college preparation (1=Yes; 0=No) (C1HRSCOLLEGE).
Postsecondary Plan Required	A career and/or education plan is required to be submitted by the student. A binary dummy variable was created (1=Yes; 0=No) (C1PLAN).
College Fairs Offered	The school hosts college fairs for their students (C1CLGFAIR).
College Representative Visits	The school hosts visits from college representatives (C1POSTSECREQ).
College Visits	School organizes visits to colleges (C1VISITCLG).

	College Prep Program	School offers programs such as AVID or Upward Bound that assist students in the transition from high school to college (C1UPBOUND).
	Information Sessions	School holds information session on transition from high school to college (C1INFOSESSN).
	Financial Aid	School assists students in with finding financial aid for college (C1FINANCEAID).
	Counseling Curriculum	School offers a counseling curriculum to support positive academic behaviors (C1BEHAVIOR).
	College Transition	School takes other steps to assist in transition to college (C1ASSISTOTH).
Study 1 Dependent Variables		
	11^{th}-Grade College Aspirations	Highest level of education student thinks s/he will achieve by 11^{th} grade. (X2STUEDEXPCT). A dummy variable was created to differentiate between high college aspirations (BA or higher) and low college aspirations (AA or lower).
	Four-Year College Enrollment Status	The type of postsecondary institution the student is enrolled in, if applicable, as of 2016, categorized as: 1) 4-year; 2) 2-year; or 3) less than 2-year. A binary variable for four-year college enrollment level was created (X4REFLEVEL).
Study 2 Dependent Variables		
	Offers AP	School offers AP courses (A1OFFERAP).
	Offers IB	School offers IB courses (A1IB).
	College Prep Coursework Offered	Dummy variable created to indicate whether a school offers AP or IB courses. (apib).
	AP Course Aspirations	9^{th} grade student aspires to enroll in AP courses. (S1AP).
	IB Course Aspirations	9^{th} grade student aspires to take an IB test. (S1IBTEST).
	College Prep Course Aspirations	9^{th} grade student aspires to enroll in AP course or take IB test (aspire).
	AP Course Enrollment	Student enrolled in AP course in high school. (S3AP).
	IB Course Enrollment	Student enrolled in IB course in high school. (S3IB).
	College Prep Course Enrollment	Student enrolled in college prep courses (AP or IB) in high school (advcourse).
	Four-Year College Enrollment Status	The type of postsecondary institution the student is enrolled in, if applicable, as of 2016, categorized as: 1) 4-year; 2) 2-year; or 3) less than 2-year. A binary variable for four-year college enrollment level was created (X4REFLEVEL).

Study 3 Dependent Variable

College Enrollment Selectivity Level	Selectivity level of student's postsecondary institution as of Feb 2016 (X4REFSELECT). A five-category variable was generated: 1) Non-college; 2) No classification; 3) Inclusive; 4) Moderately selective; and 5) Highly selective.