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Six-Year College Graduation Status for High School Students Participating in an Upward Bound Program

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by

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Abstract

This study examines the impact of high school academic indicators and participation in the federally funded Upward Bound program on college graduation rates for first-generation, low-income students. Specifically the extent to which participation in the federally funded TRIO Upward Bound program and related factors—high school GPA, course rigor, program involvement, gender, race, and college type—predict 6-year college graduation rates for first-generation, low-income students. Using stepwise logistic regression analysis on data of 163 students in an Upward Bound program in the Southeast, the results show that students with higher GPAs, active engagement in the program, and females were significantly more likely to graduate within six years. These findings underscore the importance of taking rigorous high school courses and active program participation in promoting college success among first generation, low-income students. Implications include accessibility for opportunities to take rigorous courses in high school, finding programs like Upward Bound that help increase college success, developing mentoring relationships with students, and public policy that addresses college affordability along with support of funding of programs like Upward Bound. This study also reveals the need to consider gender disparities in college success with males needing direct support services.

Chapter One: Introduction

Like many programs that aim to reduce poverty and boost opportunity, federal college-preparation programs expanded greatly during President Lyndon B. Johnson's (LBJ's) War on Poverty (Haskins & Rouse, 2013). The Federal TRIO programs (TRIO) are outreach and student services programs created to identify eligible youth and adult populations from underrepresented and underserved communities (U.S. Department of Education, 2023). TRIO's target populations include first-generation college students, low-income individuals, and individuals with disabilities. TRIO represents the birth of Upward Bound (1964: services for high school students), Talent Search (1965: services for middle school students), and Student Support Services (1968: services for college students). TRIO has since expanded to include a variety of educational pipeline programs, but TRIO has remained the umbrella term. Programs include Upward Bound Math Science (i.e., for high school students interested in exploring science, technology, engineering, and math [STEM]), Veterans Upward Bound (i.e., designed for military veterans going back to college), Ronald E. McNair (i.e., designed for undergraduate students interested in pursuing graduate degrees), and education opportunity centers (i.e., for adults who want to go to college). These programs focus on assisting those students through the academic pipeline, from middle school to post-baccalaureate achievement. The Upward Bound program, one of the oldest federally funded programs in the country, has served as a successful recruitment and retention program for low-income high school students through the provision of an intense summer program in addition to continued academic and social support throughout the academic year (Love, 2009). Specifically, it provides fundamental support to high school students to aid in their preparation for, transition to, and ultimate graduation from college. Services include

academic instruction, tutoring, counseling, mentoring, cultural enrichment, work–study programs, college and career exposure, and education and counseling services focused on improving financial and economic literacy among participants and families. Although the Upward Bound program is free for students, potential participants must apply to be in the programs hosted at higher education institutions, community-based organizations, and secondary schools. The thrust of the Upward Bound program is that intensive services for this population of students will work to increase their college success. In 2024, there were 3,200 programs nationwide (including U.S. territories), serving 880,000 students, and federally funded at 1.2 billion dollars. It is valuable to understand the effect of participating in the program.

Statement of the Problem

The focus of my study was to highlight college readiness indicators in high school that, if addressed early, may affect future college attendance and graduation (Lunceford et al., 2017). The attendance rate of first-generation college students has remained significantly lower than that of students with college-educated parents (i.e., 45% versus 25%; Blackwell & Pinder, 2014). Low-income families face systemic issues that create barriers to long-term success. Significant differences in the quality and quantity of education obtained in earlier years constitute inequalities in conditions that launch students to further success or failure later in their college years (Bottia et al., 2016).

Low-income neighborhood schools enroll more disadvantaged students, experience greater absences and disciplinary measures, have fewer experienced or certified teachers, pay teachers lower salaries, and have lower achievement and achievement growth (A. Owens et al., 2019). Various scholars have agreed the U.S. educational system, since its existence, has been characterized by segregation and racially differentiated opportunities, both strongly correlated

with neighborhoods and school location (Monarrez et al., 2019; Roscigno et al., 2006; Waite & Smith, 2004). Anyon's (1980) groundbreaking study concluded social and cultural capital strongly correlated with access, future occupation, and, ultimately, socioeconomic status. Many first-generation, low-income college students often lack the fundamental resources to obtain a degree in a timely fashion. Underrepresented first-generation, low-income college students face particular challenges in attaining higher levels of education (Tate et al., 2015). These challenges are well researched and documented. Students from low-income backgrounds know college can lead to a new socioeconomic level; however, the solution to having too little money is to spend potentially tens of thousands of dollars on college, which presents a tragic catch-22 (Nyhan, 2015).

First-generation and low-income students of color from high schools lacking the resources suburban schools are sometimes admitted into college on a provisional basis and framed as "at-risk" students (Gray, 2013, p. 1246). Enrollment into honors and advanced placement courses by low-income students depends often on the resources available at the high school. One study demonstrated low-income students' participation rate is 20% lower in college than other students (Kezar, 2011). They arrive on college campuses more likely to attend high schools with less rigorous curricula and less likely to enroll in advanced placement (AP) courses, which is an indicator of college success (Hébert, 2018). The problem, then, exists within the confines of first-generation, low-income students having equitable resources to prepare them for entering and succeeding in higher education institutions.

The cost of a college education can be overwhelming to low-income families and in-turn impact college graduation. Young adults are told college is the best path to financial success; however, they have not been informed that potential success varies by degree and ability or if

taking on massive debt might not be worth it (Webber, 2016). Debt may be an especially large burden for young adults from lower income and less educated backgrounds because they have a high risk of high-debt loans (Houle, 2014). Although two-thirds of all students have student loan debt, low-income and ethnic or racial minority students carry the heaviest amount of debt (Buchanan & Wilson, 2017). With college affordability, student debt, and increasing issues of income inequity reflective of educational attainment, improving the informed financial decision-making of students is not just a good idea—to many higher education stakeholders, it is a moral imperative (Eichelberger et al., 2019). When economic conditions—typically assessed using unemployment rates—are favorable, young people forego college and are more likely to go into the labor market (Chen & Yur-Austin, 2016).

Men also trail women in college graduation rates. In 2021, 39% of women aged 25 and older had a bachelor's degree or higher, compared to 37% of men in the same age group. This gap widens among younger adults aged 25 to 34, where 46% of women hold at least a bachelor's degree, compared to 36% of men (Pew Research Center, 2022). Highlighting these challenges is critical to developing models and best practices for professionals working with first-generation, low-income students to enhance academic and college preparation by male and female students.

Although college-going disparities along racial and socioeconomic outlines exist, research has shown specific college readiness indicators in high school that, if addressed early, may affect future college attendance positively (Lunceford et al., 2017). Some indicators include high school rigor, college selection, involvement in college prep programs such as Upward Bound, and support leading to student success across races and genders. For instance, a study by Engberg & Wolniak (2014) found that enrollment in rigorous high school courses positively correlates with college success, even after controlling for demographics such as gender,

ethnicity, and socioeconomic status. This study is unique in its focus on specific high school predictors of graduation like GPA, course rigor, participation in programs like Upward Bound, college selection type, race, a detailed comparison of graduates versus non-graduates, and the inclusion of gender differences. Using stepwise logistic regression, it offers rigorous, quantitative analysis centered on first-generation, low-income students, providing targeted recommendations for improving Upward Bound's impact.

Assumptions and Purpose of Study

Students who participate in an Upward Bound Program during high school receive a myriad of support services that prepare them for college, such as academic advising, tutoring, instruction, college tours, and residential living experiences on a college campus. The college preparation process for these first-generation, low-income students differs from a student who has not had the benefit of these experiences. For example, it would be expected that Upward Bound students will have taken rigorous classes in high school, have higher college enrollment rates, and have higher college graduation rates because those are program goals. National data have also indicated gender differences (e.g., female students performing better than male students) in college enrollment and graduation rates, so examining if those differences remained true for these Upward Bound participants was important.

This study's primary aim is to assess how participation in the Upward Bound program affects the 6-year college graduation rates of first-generation, low-income students. Specifically, it focuses on the predictive power of high school GPA, the number of honors or AP courses, and demographic variables such as gender and race. While demographic variables themselves cannot be influenced by program interventions, they provide essential covariates that help clarify the overall effectiveness of Upward Bound. This approach offers a comprehensive understanding of

the ways in which both academic and social factors contribute to students' success in higher education. Preparing students for college by engaging them in simulated experiences prior to getting there could increase their college graduation success rates. Unfortunately, most research has focused on students once they arrive at college or decide not to attend (Gibbons & Borders, 2010). Given 38% of low-income students do not attend any postsecondary institution, support is needed to prevent the further erosion of lost talent and curtail the enduring cycle of social inequality that has characterized U.S. society for centuries (Engberg & Allen, 2011). Ensuring more students enter high school on time, with proficient math and reading skills, and that they pass all their ninth-grade courses is essential (if not sufficient) for raising college readiness rates and the proportion of students who enroll in college after high school (Mac Iver & Messel, 2013).

Significance of Study

This study adds to the scholarly body of knowledge focused on the TRIO programs' success, specifically Upward Bound. In addition, the findings can influence public policy to support programs like Upward Bound. Research in this area can lead to best practices for creating a culture of thinking that focuses on the benefits of preparing for college early (e.g., academically, involvement in programs like Upward Bound, and determining specific needs by gender. These forms of literacy include learning mainstream academic skills and building relationships with people who can connect students with these resources (Nuñez, 2009). That is, through access to these social networks, students acquire the skills and knowledge to qualify for and consider college and begin to accommodate a college-going identity (Saunders & Serna, 2004).

Graduating from college creates a better quality of life in the United States. Education beyond high school serves as a buffer against the specter of unemployment, with increasing education levels leading to lower unemployment levels (Tate et al., 2015). Results of this study could benefit college success professionals as they work with first-generation, low-income students and their postsecondary pursuits. Creation and implementation of comprehensive college preparatory programs focusing on improving these traditional indicators of college readiness for low-socioeconomic and racial minority students could help increase college degree attainment (Lunceford et al., 2017).

Examining college types helps guide students to colleges with good retention and graduation rates, are affordable, and provide supportive environments. Academically, students with strong GPAs may be able to increase their college graduation rates by taking rigorous courses in high school that provide opportunities to apply to more selective colleges with a record of success. The U.S. Department of Education offers Advanced Placement Incentive Program (APIP) grants to school districts to encourage the participation of low-income students in AP curricular tracks (Rodriguez & McGuire, 2019).

Conceptual Framework

A central assumption underlying various approaches labeled constructivism is that human beings create systems for meaningfully understanding their worlds and experiences (Pavlović & Maksic, 2019). Constructivism was stimulated by several scholars, including Dewey (1929), Piaget (1952), Bruner (1966), Von Glasersfeld (1989), and perhaps principally by Vygotsky (1978; Tobias, 2010). According to Vygotsky, collective social experiences in various social environments affect individuals' social orientation, which ultimately influences their cognitive functions (Neutzling et al., 2019). Learning is an opportunity for learners to become critical

thinkers, problem solvers, and decision makers while recognizing the meaning of past experiences and applying new knowledge during authentic opportunities (Neutzling et al., 2019).

Constructivists believe learning is affected by the context in which an idea is taught, along with beliefs and attitudes (Bada & Olusegun, 2015). How students learn about pathways and opportunities in the future from educators allows them to become critical consumers of valuable information. This interaction with knowledgeable teachers or peers shapes learners' perceptions, impacting knowledge construction (Campbell et al., 2020). Teaching is not a mere transfer of knowledge from the outside to the inside but rather a process where learners construct their knowledge and experience actively—that is, a process of enriching and rebuilding their own knowledge and experience through the repeated and two-way interactions between new and prior knowledge and experience (Lin, 2018). The construction of knowledge is a two-way process, where prior knowledge is structured according to the variability of specific cases (Lin, 2018).

From a constructivist perspective, learning environments and pedagogical interventions must support the active construction of knowledge, offer a meaningful context for learning, and enable collaboration among learners and the instructor (Doyle et al., 2019). Doyle et al. (2019), in a study of pedagogy in the contemporary higher-level education environment, stated using constructivist learning techniques (e.g., co-creation) effectively and efficiently has become increasingly important to retell them with new, significantly different, non-defensive meaning. As seen in the constructivist philosophy, the learner-centered and flipped-class models of higher education pedagogy emphasize the learner's role in moving from passive to active (Glance et al., 2018). Krahenbuhl (2016) argued, though focusing on higher order thinking skills and increasing the inculcation of skills is something teachers should do, they ought to be intentional about their use of constructivism if used as a pedagogical framework for instruction. Porath (2016) urged

teachers to examine their beliefs about teaching and learning, discover the underlying assumptions of the packaged curriculum, and articulate what they perceived as the school's and parents' perspectives on teaching and learning. Knowledge provided in textbooks will no longer be the content conferred by teachers; it will be the object of meaning actively constructed by students to create scenarios for collaborative learning and knowledge exchange (Li, 2018). Li (2018) stated authentic assessment of learning focuses on collection of performance information of students engaged in real learning activities, by which to examine their competences to apply knowledge and skills in real scenarios.

First-generation college students face obstacles because the family unit has no prior history of navigating the college system or social networks with that knowledge base. These challenges include the financial ones of preparing for and going to college, and having a group of students vulnerable to not enrolling or persisting once there. College preparatory programs are key because they provide students with new learning, enhancing the experiences needed to understand high school actions needed to achieve success on the next level. If students learn how to reconstruct and retell their stories from different perspectives, they can change their scripts (Robinson, 2020). Empowering the student with academic support, mentoring, coaching, and knowledge about college can increase skills and likelihood of persisting to college graduation.

Methods

Research Question: To what extent do the following predictor variables relate to college graduation status for students participating in an Upward Bound Program?

- GPA at completion of high school (Unweighted and Weighted)
- Number of honors classes completed in high school
- Number of AP classes completed in high school

- Gender
- Race
- College type
- Program involvement

Null Hypothesis: There is no significant relationship between participation in the Upward Bound program, high school GPA, course rigor (honors/AP classes), gender, race, college type (2-year vs. 4-year), and the likelihood of graduating from college within six years among first-generation, low-income students.

Program Overview

The Upward Bound program under study was located at a 4-year institution in the southeast region of the United States. Required services include tutoring; academic advising; assistance with preparation for college entrance exams and the college admission process; understanding financial aid and assistance with the financial aid application; growing financial literacy; offering alternative education program assistance if needed; and facilitating a curriculum that focuses on success in core classes like math, laboratory sciences, foreign language, composition, and literature. Other permissible services include exposure to cultural events, college tours, career development, on-campus residential programs, mentoring, work–study programs, support for students with limited-English proficiency, and other services that boost motivation and skills to attend college. Students participate by attending 18–25 Saturday sessions during the academic year and a 6-week summer program that includes all services mentioned previously.

Research Design

This sample size was 163 Upward Bound students, including high school graduates of Upward Bound classes of 2009, 2010, 2011, and 2012. Their grade point average (GPAs) at the completion of high school and the number of honors and AP courses they took in high school were predictors for college graduation rates. Student involvement in Upward Bound would determine if a relation to college graduation existed. College graduation data came from the National Student Clearinghouse, a national database that tracks college enrollment and completion. Graduation rates were presented by the type of institution a student in this sample attended (i.e., 2- or 4-year) to help determine success by college type for students. Gender and race differences were examined to determine if there were significant differences in college success from those in Upward Bound who enrolled in college.

Definitions of Terms

As defined in the Code of Federal Regulations (CFR, Year) for Upward Bound:

First Generation:

(1) An individual neither of whose natural or adoptive parents received a baccalaureate degree; or

(2) A student who, prior to the age of 18, regularly resided with and received support from only one natural or adoptive parent and whose supporting parent did not receive a baccalaureate degree.

Low Income:

Low-income individual means an individual whose family taxable income did not exceed 150% of the poverty level amount in the calendar year preceding the year in which the

individual initially participates in the project. The poverty level amount was determined using criteria of poverty established by the U.S. Census Bureau of the Department of Commerce.

Academic Rigor:

An advanced or honors secondary school program established by states and in existence for the 2004–2005 school year or later school years;

(i) Four years of English.

(ii) Three years of mathematics, including Algebra I and a higher-level class such as Algebra II, geometry, or data analysis and statistics.

(iii) Three years of science, including 1 year each of at least two of the following courses: biology, chemistry, and physics.

(iv) Three years of social studies.

(v) One year of a language other than English;

Program Involvement

Upward Bound students who completed the program through to high school graduation and were present 80 percent of the time to program services (20 out of 25 Saturday tutorial sessions during the academic year) & (24 out of 30 summer program days).

Unweighted and Weighted GPA:

Unweighted GPA provides a measure of a student's overall performance without factoring in course difficulty, making it a simple average of grades. **Weighted GPA** adjusts for the level of difficulty of the coursework, rewarding students for taking more challenging classes. It can lead to GPAs higher than the typical 4.0 scale, giving a view of a student's academic rigor.

Summary

First-generation, low-income students face challenges to success in college. Studies to determine factors that help this population of students excel to college graduation are critical. Further, a student with no family history of college, coupled with the financial stressors of paying for college, acts as a burden to college completion. Creating awareness for families and college success professionals helps identify factors such as high school performance, rigor, and college selection that maximize pathways to success. This study examined first-generation, low-income students in an Upward Bound program to see how their college preparation led to success in institutions of higher education, specifically 6-year college graduation rates. Further, differences by gender and race in college graduation attainment need to be understood to create best practices. Findings helped to determine lessons learned for the general-public.

Chapter Two: Literature Review

The purpose of this quantitative study was to shed light on how first-generation, low-income students can be college ready**.** Using objective data, including grade point averages (GPAs), college-going rates, and college attainment rates, the study sought to reveal the impact of students' preparation for college through participation in the Upward Bound program. This chapter provides major thematic categories illustrating the myriad realities first-generation, low-income students face. These categories include (a) parent, family, and community; (b) networks and social capital; (c) high school rigor; (d) college preparation programs; (e) testing; (f) college choice; (g) retention and graduation rates; (h) financial gaps; (i) gender gaps; and (j) psychological factors. Finally, a summary of the research is provided with relevance to the established research questions.

Parent, Family, and Community

Schools certainly can dramatically impact students, but experiences outside school (e.g., neighborhoods, health, and family) influence student outcomes (Bower & Rossi, 2019). In fact, children receive their first introduction to the importance of acquiring knowledge, behaviors, and skills to push them further in life from their parents (Aschaffenburg & Maas, 1997; Demain, 2003). From that standpoint, schools then work to prime and instigate knowledge, behaviors, and skills, known as cultural capital (Anyon, 1981, 2011; Bhattacharya, 2017; Collins, 2009; Demain, 2003; Luke, 2010). As Demain (2003) stated, "The school and the family are said to play their part in social reproduction as each new generation takes up social roles and occupations left by the previous generation as well as newly emerging occupations" (p. 126).

Further, poverty often affects family influences, school resources, exposure to academic activities, and community resources (Morgan et al., 2015). Studies by Astin (1993) and Tinto (1993) revealed high school grades, parents' education levels, family encouragement, and academic and social integration were primary determinants of degree attainment (S. R. Johnson & Stage, 2018). This idea of a child's success being predicated on their parents' socioeconomic status, including income, neighborhood of residence, and educational level, was revealed in Anyon's (1981) research on various fifth-grade classrooms from different schools. Research is replete with exploring the impact a child's parent and family have on their ultimate outcomes in life.

The college search and application process functions through high schools and higher education institutions that operate according to dominant class-based cultural rules and privilege those knowledgeable about negotiating these rules (Holland, 2020). In a study by Phillips et al. (2020), results suggested social class background systematically informs the quality of students' interactions with their college environments and the opportunities they have to capitalize on these rewards. Even when first-generation, low-income students gain access, navigating with purpose is still an issue. Donlan et al. (2016) found community poverty predicts lower attainment in addition to moderating the associations, among other factors, that could promote high school graduation and college enrollment, namely school engagement and maternal academic monitoring. Rising rates of father-absent homes, concentrated in low socioeconomic communities, may impede young male students' attainment (J. Owens, 2016).

The family history of going to college provides a knowledge base and support that does not exist with first-generation, low-income students. Students with college-educated parents remain more likely to make the decision early to go to college and attend immediately after high

school graduation (Harding et al., 2017). Students from college-educated families benefit from their parents' experiences; these families better understand the preparation, application, and attendance processes (Gibbons et al., 2012). Parents' educational involvement has consistently had a positive effect on children's achievement (Toren, 2013). Gathering early and greater amounts of information prepares families to make better decisions about college options and requirements and increase aspirations while limiting discouragement due to incorrect cost estimates and the misalignment of ambitions (Myers & Myers, 2012).

Blackwell and Pinder (2014) revealed first-generation college students, unlike third-generation college students in the study, were not encouraged by family to attend college, but their inner drive to attend college to achieve a better way of life for themselves led to them being the first in their families to attend and to graduate from college. Niu and Tienda (2013) found high school college orientation, family background, and precollege academic preparation largely explained why graduates from affluent high schools who first enrolled in 2-year colleges had higher transfer rates to 4-year institutions; however, these factors and college characteristics do not explain lower transfer rates for students from under resourced high schools. Children learn directly about the roles adults play in the workforce (e.g., mom works in a restaurant; she is a chef) and indirectly by observing family members' attitudes, values, and behaviors about work through conversations about the workday (Pérusse et al., 2017).

In a study of parent self-efficacy by Glatz and Trifan (2019), their findings indicated parents might need different support depending on whether they lack confidence in their parenting practices (i.e., parents' efficacy expectations) or if they perceive their child is unresponsive to their socialization efforts (i.e., parents' outcome expectations). Findings from a study of over 4,000 parents and their high school children show parent–student discussions are

enhanced when parents and students engage individually in college preparation, have higher college aspirations, and are more involved in the school and community (Myers & Myers, 2012). Because first-generation parents do not have college experiences of exploring institutional programs and services to help their students, institutions should reach out and create more programs to cater to their needs (Harper et al., 2020).

Campus leaders should look strategically to engage community partners. In a study of campus and community partnerships (Kezar, 2011), few successful partnerships had community partners who had become bicultural and understood the postsecondary environment, their values, commitments, and the decision-making and planning approaches of postsecondary institutions (Kezar, 2011). College professionals should pay attention to family dynamics. School personnel should reach out more frequently to parents of low-income, first-generation students about college and facilitate the development of parent networks to enable families to collaborate with one another (Mitchall & Jaeger, 2018). Although students experiencing late-family structure changes in high school are as likely to apply to colleges of similar selectivity as students from two-parent biological families, they are less likely to enroll at these colleges (An & Sorensen, 2017).

Networks and Social Capital

Webb et al. (2017) suggested the importance of discussing Bourdieu's work when discussing the influence of capital on students in schools. According to Bourdieu (1997), three forms of capital are: (a) economic capital, which equates to resources of money; (b) cultural capital, related to areas such as competency, knowledge, beliefs, and access to goods; and (c) social capital, which are actual and potential social networks that, in turn, have readily available access to economic and cultural capital (Calderón Gómez, 2021). According to Bonanno (2018),

cultural and social capital give access to economic capital; however, because cultural and social capital lend themselves more toward assets acquired in school, only those two are reviewed in this section.

Cultural capital, or intangible resources such as competency, knowledge, beliefs, and access to goods, are made relevant by educational institutions, including elementary, middle, and high schools as well as universities (Bonanno, 2018). These institutions play an integral role in legitimizing knowledge and, in turn, play an integral role in determining who has access to said knowledge (Bonanno, 2018; Hatkoff, 2016; Webb et al., 2017). Further, members in elite groups have a goal of remaining elite, thereby limiting access to the group to not depreciate the group's legitimacy (Bonanno, 2018). This limited access acts as a barrier to low-income students, and Aschaffenburg and Maas (1997) argued education exacerbates imbalances between low- and high-income students.

Social and cultural capital are established early in childhood, have a direct correlation to economic status, and are ultimately perpetuated in educational systems (Aschaffenburg & Maas, 1997; Willis, 1981). Students with access to these capitals tend to master academic material better, develop a yearning for abstract concepts and learning experiences, and are often favored ahead of their friends and peers who have less capital (Escoffery, 2007). This lack of access to certain types of capital presents a serious barrier for first-generation, low-income students, partly due to their heavy reliance on established networks.

First-generation, low-income students rely on professionals to be their social capital. Professionals bring resources, information, and experience in college preparation that add value to the student–professional relationship. When applying the social capital approach to urban education, it can be argued that urban schools can develop social capital to improve college

readiness for low-income students through (a) building caring relationships, (b) establishing social networks, and (c) providing college and career resources (Yavuz et al., 2019). A qualitative study by Hébert (2018) found like-minded students who worked closely together helped to inspire each other to do more, work hard, and focus on the future. Sokatch (2006) supported that assertion, highlighting that friends' wishes, especially friends' plans, are particularly powerful and robust predictors of 4-year enrollment for low-income, urban, and minority high school graduates.

Conversely, students who find it difficult to ask for help, seek relationships with faculty, get involved on campus, and make social connections might have difficulty succeeding academically (I. Johnson, 2017). In a qualitative study by Bjorklund (2019), students, specifically Latinos, expressed and exhibited a lack of social belonging; a lack of positive, authentic teacher–student relationships; and a lack of academic belonging in their AP and honors classes. Students with close friendship ties also have a lower risk of dropping out (Carbono & Workman, 2013).

Relationships with mentors who understand navigating college pathways are crucial for first-generation, low-income students. Benefits of such a relationship include immersion in learning and applying the methodology of their respective fields, engagement in authentic problem solving, increased self-confidence, self-awareness, development of professional skills, improved time management and organizational skills, and the benefits of sharing intellectual passions with a supportive adult (Hébert, 2018). Enberg and Allen (2011) found low-income students who used coaches, college representatives, and college publications or websites were more likely to attend a 4-year institution than students who did not take advantage of these resources. Given the transformative potential of this experience, mentoring provides a special

chance for protégé impact and development, one student or alumna at a time (Reilly, 2017). Higher education scholars, teachers, and practitioners have a responsibility to understand these students as learners, given that a central purpose of higher education is learning (Ives & Castillo-Montoya, 2020). When students realize their teachers and mentors understand their backgrounds and genuinely care about them as whole people, they are more open to responding positively to instruction (Sanacore, 2017). Faculty mentors teach skills, model behavior, and serve as career resources (Reilly, 2017).

For young men, support from a male professional figure is beneficial. In a study of male student participation in college preparation courses in high school (Watt et al., 2017), coordinators reported the difficulty of recruiting and retaining boys due to several factors, including the lack of male teachers, a classroom cultural environment that may favor female students, peer influences, and the lack of leadership and mentoring opportunities for male students. The greater levels of academic self-challenge and sense of belonging facilitate students' classroom engagement, promoting their cognitive development skills (Kim & Lundberg, 2016). If the early college focus is strongly on students who are underrepresented in higher education (e.g., low-income students, students of color, first-generation college goers, and English language learners), then the teaching staff should reflect the same diversity to the extent possible (Ongaga, 2010).

High School Rigor

Even when identified, low-income students may have low academic self-efficacy and enroll in lower-level academic coursework (Gibbons et al., 2012). Underprepared students are less likely to attend college and have a harder time in college (Tierney & Garcia, 2011). Effective preparation for college involves students putting themselves in a position to challenge

themselves while in high school by taking rigorous classes to simulate a college experience. The College Board asserted that work done in AP courses helps students develop skills and study habits vital in higher education (Vaughn, 2010). As pathway programs, these enriched curricula are meant to bridge the transition between high school and postsecondary studies by offering academically prepared students a more rigorous high school experience (Park et al., 2014). According to Rowland and Shircliffe (2016), the College Board found low socioeconomic students who took AP courses from 2004–2009 had higher 4-year college enrollment and greater retention rates than their peers who did not participate in AP courses. Simply, high school students who graduated with higher test scores, better grades, and more rigorous coursework were more likely to enroll in and graduate from 4-year colleges (Roderick et al., 2009).

In a study by Jeffries and Silvernail (2017), participants who scored higher on college entrance examinations and had higher undergraduate GPAs were more likely to earn advanced degrees and have higher lifetime income. Increases in AP course offerings, enrollment, and test taking in recent years reflect a widespread consensus on the need to increase high school academic rigor (Vaughn, 2010). When all students have the opportunity to master a rigorous curriculum with relevant and interesting subject matter, competition can be with the self and previous performance rather than with peers (Cross et al., 2018).

McKillip and Rawls (2013) found students with higher AP exam scores seem to benefit the most from AP experiences, though this finding varied depending on the AP subject. In a study by Kretchmar and Farmer (2013), data indicated students who took at least five AP, International Baccalaureate, or dual-enrollment courses typically outperformed those who did not take any. Research by Klopfenstein and Thomas (2009) indicated the predictive power of AP course enrollment was likely the result of signaling; high ability motivated students to take more

AP classes to differentiate themselves from other students in the college application process. AP courses must participate in a course audit that may include requirements such as using appropriate textbooks, ensuring the teacher has read AP materials, guaranteeing the course is structured around key concepts, and submitting a syllabus aligned with AP framework (Judson, 2017). Educators, administrators, and guidance counselors are encouraged to use PSAT scores to increase AP enrollment, specifically targeting underrepresented student populations (Rowland & Shircliffe, 2016). Despite inconsistencies in grading practices across courses, teachers, and schools, grades tend to predict college success and—if not better than—standardized tests (Hansen et al., 2019).

Unfortunately, researchers have noted gaps in AP enrollment and performance based on race. Rodriguez and McGuire (2019) recommended going beyond whether AP is offered at the school and understanding the lack of Black student representation in AP courses. College Board AP exams for the 2016–2017 school year showed 42% of Latina/o students scored a passing grade of 3 or better compared to 64% of White students and 70% of Asian students (Bjorklund, 2019). Some researchers have viewed this discrepancy as a time to question the expansion of AP opportunities rather than a signal to increase preparation for rigorous course taking and a redoubled effort to expand equity and excellence opportunities for urban students (Vaughn, 2010).

College Preparation Programs

Prior studies on the impact of college preparation programs are numerous. Although some studies questioned the impact and direct positive correlation with college readiness and success, most students found them to affect participants' entry and graduation from college positively. Such impacts include reduced college drop-out rates (Ishitani, 2003); improved

academic skills, including use of technology and interpreting syllabi; and academic efficacy (Strayhorn, 2011). Strayhorn (2011) exemplified the importance of college preparatory programs, particularly for underrepresented students. One such example of a program is the TRIO Upward Bound program, funded by the U.S. Department of Education.

Zulli and Frierson (1998) conducted a broad evaluation study of the University of North Carolina at Chapel Hill Upward Bound program during the 1996–1997 academic year. This qualitative study concluded parents found their children enrolled in more rigorous courses while increasing grades, communication skills, self-confidence, attitudes toward education, and study skills because of program participation. Further, students had improved attitudes toward education, overall character improvement, increased self-confidence, increased motivation, increased levels of maturity, and increased communication skills. Parents in the study perceived their child's participation in the TRIO Upward Bound program had "significant and positive effects on their children's lives, and saw the program as being of great value to these youth" (Zulli & Frierson, 1998, p. 370). Other studies focused on student impact rather than parental perceptions.

Anderson and Larson (2009), in a case study of an Upward Bound program in the Northeast United States, found common themes in program success. The scholars centered on the theme of emphasizing rugged individualism, or the ability to "pull yourself up by the bootstraps." Additionally, Anderson and Larson indicated how the Upward Bound program helped study participants focus on the future, highlighting the importance of foresight in personal and educational success. Finally, Anderson and Larson confirmed the positive impact of immersing students in an intense academic and test preparation program such as TRIO Upward Bound.

M. A. Owens (2013) conducted a study of the TRIO Upward Bound Program, housed on the campus of a western university. The main focus of the student was to understand leadership and the specific contributions those students make when they enter their college campuses. M. A. Owens found participation in the program increased leadership skills through a positive willingness to give to and take from fellow students and program staff due to an environment and culture of trust.

The fourth study examined the academic impact the program had during the participants' 1st year in college. Laws (1999) studied the impact of 1st-year performance in college of Upward Bound graduates, focusing on GPA, dropout rates, and English and math grades. Laws uncovered significant results indicating Upward Bound students performed better in English than math and were more likely to be retained from the 1st to 2nd year of college.

Finally, the U.S. Department of Education (2021) released a study focused on the TRIO Upward Bound program. Of note was the finding that Upward Bound participants had a higher rate of postsecondary degree completion than eligible students who did not participate in an Upward Bound program. Further, those students who graduated from Upward Bound who continued in the TRIO pipeline and enrolled in a TRIO student support services program at their college matriculated and graduated at a higher rate than those who did not participate in the collegiate TRIO program. Dika and D'Amico (2016) found early access to academic performance strategies and programs for first-generation students to be a significant indicator of these students' college persistence, particularly in science, technology, engineering, and mathematics (STEM). The five aforementioned studies demonstrated the various areas of positive impact the TRIO Upward Bound programs have on students.

TRIO Upward Bound and Upward Bound Math Science students enter college immediately after high school graduation at significantly higher rates than those from similar socioeconomic backgrounds who did not participate in a TRIO program. From the high school graduating class of 2018, 84% of TRIO Upward Bound and 86% of TRIO Upward Bound Math Science entered college, compared to 64% of students who were not in the program. Further, when reviewing college degree attainment, only 13% of students from the bottom income quartile attained a degree by the age of 24. In comparison, 53% of TRIO Upward Bound participants and 47% of TRIO Upward Bound Math Science students completed degrees by age 24. When on campus, students continued to face obstacles in matriculating through college.

Some college readiness programs, including GEAR UP, Upward Bound, and Advancement via Individual Determination (AVID), helped to build important peer and adult relationships that were significant to student success (Huerta et al., 2013). AVID is an in-school academic support program originally developed for students in Grades 5–12 and designed to prepare high school students for 4-year college eligibility and success (Llamas et al., 2014). A study by Watt et al. (2013) on enrollment in AVID classes showed students receiving the AVID intervention had higher GPAs and retention rates than comparison groups. Similarly, in a study by Llamas et al. (2014), both qualitative and quantitative results provided evidence suggesting the AVID program improved school support and engagement and development of individual resilience factors, such as self-awareness, problem-solving ability, and self-esteem.

A plethora of new movements in the academy, including service learning, campus and community partnerships, civic engagement initiatives, and action- and community-based research, are built on the premise that urban educators and postsecondary institutions need to engage more with external communities and support urban areas (Kezar, 2011). Students

participating in these types of campus-based programs are not only more likely to attend college, but they also understand the important benefits of pursuing a bachelor's degree much better as a result of their exposure to faculty and undergraduate students (Garibaldi, 2014). Morgan et al. (2015) examined the effectiveness of Gear-Up surveyed graduating high school seniors, regardless of the intensity of their participation, and reported college tours and fairs (40%), SAT and regents preparation (26%), tutoring (27%), and financial aid workshops (20%) had the greatest impact on their academic success and college aspirations. In that same study, findings generated from statistical analysis of the parent survey indicated parents who became involved in the program's activities, were informed about their child's academic performance, became knowledgeable about resources available to finance a postsecondary education, and had high expectations for their children (Morgan et al., 2015). A study of student involvement in college preparation activities showed seniors who only participated in AVID while in high school, compared to seniors who participated in AVID in both middle school and high school, exhibited greater academic performance, were more likely to take rigorous courses and took, on average, more AP courses (Huerta et al., 2013).

Testing

Standardized admission test scores are used to evaluate students' levels of readiness for college-level work and, thus, their likelihood of being successful in college if admitted (Mattern et al., 2018). In the United States, most colleges use selection systems that include standardized entrance examinations (e.g., SAT, ACT) and records of high school performance (e.g., GPA) to predict the likelihood that prospective students will succeed once enrolled (Kostal et al., 2017). Socioeconomic status influences access to college because entrance examinations and exam preparation are costly (S. R. Johnson & Stage, 2018). For the 2015 SAT takers, 61.3% of Asian

students met the benchmark and were identified as college ready compared to 52.8% White, 32.7% Native American, 22.7% Hispanic, and 16.1% African American students (Pérusse et al., 2017). Depending on the institution and its local practices (e.g., admissions, grading, affirmative action policies) and various contextual and societal factors, it is possible that there may be differential admission prediction—and the form of such differential prediction is unlikely to be the same across samples (Aguinis et al., 2016). Mattern et al. (2018) indicated the behavior of retesting (i.e., taking the SAT or ACT more than once) is predictive of college success above and beyond test scores, suggesting it may reflect socioemotional factors such as motivation or persistence.

College Choice

College choice is vital for all, especially for first-generation, low-income students whose families do not have the foundational knowledge to navigate college or the financial means to afford college tuition. Universities use the term "at risk" to identify students who are not expected to succeed academically because of factors associated with socioeconomic status, family variables, and academic deficiencies (Gray, 2013). In a study by Harding et al. (2017), students who received postsecondary information early and made decisions about life prior to beginning high school had higher probabilities of behaviors associated with going to college and earning graduate degrees.

Student engagement is important because research has indicated engaged students, especially those who have a sense of belonging in college, are more likely to succeed in completing their degrees and ultimately graduate (López, 2018). College students' sense of belonging theory assumes the concept refers to feelings that members matter to one another and the group, a person's perceived indispensability in a system, an individual's sense of

identification in relation to a group (which yields an effective response), and a student's sense of being accepted, valued, and cared about in academic spaces (Strayhorn, 2015). Individuals can, therefore, be producers of their social environments through their beliefs about what they can achieve (Brummert Lennings & Bussey, 2017).

Due to the selective nature of college, many students begin their postsecondary journey at a community college. Given the need to increase college completion, federal and state officials have looked to community colleges to enroll more students and produce additional transfer students and associate degree graduates (Buchanan & Wilson, 2017). Under Florida Senate Bill 1720 (2013), placement tests were made optional for those who graduated with a standard diploma from a public Florida high school in 2007 or later and for active-duty service members, which gave students the option to bypass developmental education courses and enroll directly in college-level English and math courses (Nix et al., 2020). The cost savings from spending 2 years at a community college before entering a 4-year college can be substantial—average full-time annual tuition at a community college is $2,439 compared with $7,136 at a public university and $22,771 at a private university (Fairlie & Grunberg, 2014).

Students denied transfer admission to their local public university largely remain in community college, accumulating units they may not need by trying to improve their GPA to be more competitive in the admission process and ultimately continuing to reapply to transfer (Neault & Piland, 2014). However, the 1.2 million community college students in the United States without access to home computers and the internet may be at a disadvantage in acquiring information helpful for transferring to 4-year universities and obtaining jobs requiring these skills (Fairview, 2014). The consequences of inadequate capacity at public universities to meet the demand for transfer students can disenfranchise large numbers of individuals, especially low-

income students and students of color who disproportionately begin their postsecondary education at a community college and who may not have other educational options to complete a baccalaureate degree (Neault & Piland, 2014). Existing empirical research has uncovered several factors influencing the success of racial and ethnic minority students once they have entered higher education: financial influences such as ability to pay for college, the type of institution a student attends (whether minority serving or selective), campus and STEM environments, institutional agents, and psychological factors (ASHE, 2011).

In a study of merit aid and graduation rates in Tennessee community colleges (Welch, 2014), findings suggested reducing the cost of community college does not impact persistence, academic performance, degree completion, expected earnings, or short-term earnings after college for marginally eligible students. Birch and Rosenman (2019) examined merit aid programs and determined they are a poor measure for attracting enrollments.

Retention and Graduation Rates

Many factors influence students' success in college, such as retention and completion, which vary nationally and by institution type. There is a problem of low college retention and completion rates nationally, particularly at colleges that are more educationally accessible (Eichelberger et al., 2019). Essentially, the easier it is to be admitted to a college, the lower the retention and graduation rates are. According to Tinto's model, the interaction between student characteristics, commitments to their educational goal, the academic contexts, and social contexts of the institutions determine students' college persistence and graduation (Liang, 2009). High school academic performance, having a prepaid college account, receiving grants or scholarships, and participating in the federal work–study program are all positively related to college graduation rates (Zhan et al., 2018). Financial constraints, concerns about accountability,

and desire for demonstrable outcomes pressure colleges and universities to increase graduation rates (S. R. Johnson & Stage, 2018). Of every 100 students who begin at a 4-year college, 57.3 graduate in 6 years (Vedder & Gillen, 2011). Although 2-year colleges provide opportunities for entry into higher education because of their geographic accessibility, are adaptable to student and employer educational needs, offer transfer routes to 4-year institutions, and reflect flexibility in scheduling and composition of courses, relatively few students complete their studies (Leavin & Garcia, 2018).

How much a state appropriates into its state university systems seems to impact college success. For instance, a college graduation study by Liang (2009) identified a 10% increase in state appropriations per full-time equivalent student at 4-year public institutions, which was associated with approximately a 0.64 percentage point increase in graduation rates. When compounded with other resources like grants and foundational scholarships, colleges can help provide students with educational and financial support. Millennials with bachelor's degrees make $15,000 more than their peers with only a high school education (Nyhan, 2015).

Financial Aid

Understanding the financial means of paying for college is critical for first-generation, low-income students. Research has shown college students are often ill prepared to make basic financial decisions if they lack requisite financial education (Eichelberger et al., 2019). Financial aid is intended to increase college access, persistence and progression through college, and the likelihood of college completion (Carruthers & Ozek, 2016). Decreasing state support (i.e., decreasing state appropriations offset by increasing tuition and fees) has increasingly become the norm in higher education (Buchanan & Wilson, 2017).

The most recent graduating college cohort is burdened by an average of roughly $30,000 in student loan debt, whereas the national total has surpassed $1.2 trillion, a figure some have claimed represents an economic bubble that could have substantial negative effects for future generations (Webber, 2016). Young adults from low-socioeconomic and middle-income backgrounds are more likely to turn to debt as a way to pay for college (Houle, 2014). In a study on loans and college graduation impact, Zhan et al. (2018) found educational loans were positively related to college graduation rates, but only to a point. Loan amounts above $19,581 began to have diminishing or even negative impact on college graduation rates. According to a recent Brookings report, Black college graduates owed $7,400 more on average than their White peers (i.e., $23,400 versus $16,000, including non-borrowers; Black-White Student Debt Gap, 2017). Educational loans do not help much in reducing racial and ethnic disparities in college degree attainment despite minority students being more likely to rely on loans to finance their college education (Zhan et al., 2018). Many students from low-income families make educational choices based on their ability to pay for college rather than their academic performance, which becomes particularly evident in highly selective colleges, where very few low-income students enroll (Hillman, 2013). Many factors, in addition to high school qualifications, affect whether students attend college and their chances of persisting to graduation, including rising costs of college and the declining real value of financial aid. (Roderick et al., 2009).

In a study by Friedline et al. (2017), results indicated lower income parents with some college education almost unanimously believed college could be a catalyst for upward mobility for their children even though they may not be prepared financially for those costs. Increases in college costs have consistently outpaced the rate of inflation; hence, the role of federal, state,

institutional, and private grant aid has become increasingly important for students from low and moderate incomes to attend the college of their choice (Davis, 2013). Drawing on an economic approach to decision making, the conceptual model assumes students make decisions about college enrollment based on an assessment of the benefits and costs of enrollment relative to their preferences, tastes, and uncertainty (Perna & Thomas, 2009). Some uncertainty about aid remains because some are uncertain about whether students will meet academic eligibility requirements, others are uncertain about how to pay the price of expenses not covered by the aid, and still others are uncertain about whether aid will be awarded after the 1st year of college enrollment (Perna & Steele, 2011). Unlike need-based aid, which is determined based on the student's and family's ability to pay, merit-based aid is based on the student's academic performance so colleges can attract the students they most desire (Elliott & Friedline, 2013). Merit aid is an increasingly important component of college scholarships, but policymakers have expressed concern that merit aid is often given to students who would enroll regardless of aid (Birch & Rosenman, 2019).

Low-income students seek additional means, like working to pay for college. Losing financial aid has the immediate effect of pushing a small share of students out of college, completely or partially, and into the workforce (Carruthers & Ozek, 2016). Balancing the need to work and earn money while attending school poses a challenge for students. For example, although part-time enrollment may reflect a student's need to earn money to afford college (and many community college students enroll part time), the structure simultaneously reduces aid eligibility (Goldrick-Rab, 2010). Situational factors significantly predictive of obtaining a degree or transferring (rather than dropping out) included full-time enrollment, higher degree expectations, and fewer planned hours worked (Porchea et al., 2010). Inability to pay for college

or insufficient financial resources, however, can force racial and ethnic minority students in STEM (and other majors) to work a substantial number of hours to pay for their expenses, adversely affecting the likelihood of their success (ASHE, 2017).

College type and selection for a student should consider the amount of financial aid being received. Data revealed the role of financial aid and college costs in the college choice process, and that being selected as a Gates Millennium Scholar enabled students to choose colleges that were more prestigious and institutions with more academic offerings (Davis, 2013). The funding available through the Gates Millennium Scholarship reduced scholars' financial concerns and increased their opportunity to choose colleges that fit better with their academic and intellectual interests (Davis, 2013).

Perhaps the most robust finding is the large, significant increase of full-time, first-time college enrollment at Florida's public institutions after the adoption of the Bright Futures program **(**Zhang et al., 2013). One of the most attractive characteristics of merit-based aid programs for states is their potential to prevent brain drain—the migration of high-achieving high school graduates to colleges in other states **(**Zhang et al., 2013). In another study of Florida Bright Futures, Zhang et al. (2016) indicated the program significantly altered students' college choices in terms of attending in-state public colleges and 4-year public colleges**.** Students who qualify for the Bright Futures program are more likely to attend state universities (Zhang et al., 2016). Using Pell Grant data as a proxy for low-income enrollment, Hillman (2013) found introduction of no-loan pledges resulted in greater representation of low-income students among selective institutions. In a study of financial literacy factors on college graduation (Eichelberger et al., 2019), results demonstrated students who opted to take and successfully complete the personal finance course had a higher probability of retention and graduation.

Success Barriers by Socioeconomic Status and Support

First-generation students, many of whom are also low income, are often represented in literature around deficit, or what they lack or do not have (Ives & Castillo-Montoya, 2020). Such recorded deficit was reviewed in the aforementioned sections and included achievement gaps, standardized testing preparation, social and cultural capital, and overall knowledge related to the college process. However, existing research has also shown how support programs can fill certain access gaps and change the trajectory of those students participating in these programs over their peers from similar socioeconomic backgrounds who do not participate in support programs.

Buchanan and Wilson (2017) noted how persistence rates for postsecondary education have remained low, which then lead to low graduation rates. The scholars noted increasing opportunities for education in the United States has been an ongoing mission. Although Buchanan and Wilson's review centered around community college, the plight was still applicable. College completion for people in the United States has declined, and rates of those adults with postsecondary degrees have declined compared to other developed countries. This decline can be detrimental to first-generation low-income students, as "each individual's social and economic mobility hinges on completing college" (Buchanan & Wilson, 2017, p. 68). The neediest students face numerous barriers to entering and completing college; first generation and students with college-educated parents are compared next through various variables.

To understand the need to support first-generation students, the pervasiveness of this population of students and the subsequent issues they face are discussed. According to Ives and Castillo-Montoya (2020), first-generation students comprise about one third of college-going students in the United States. First-generation students face systemic barriers that hinder them

from accessing, navigating, and persisting in college, all of which negatively affect academic performance and degree completion (Bui, 2002; Redford & Hoyer, 2017). These barriers have resulted in 56% of first-generation students earning a baccalaureate degree within 6 years compared to 74% of students who had a parent who graduated from college (Forrest Cataldi et al., 2018).

First-generation students face barriers before even stepping foot on campus. This transition to college, according to Ward et al. (2012), is exacerbated further when students' first-generation status intersects with other marginalized identities, including race, socioeconomic status, gender, and age. These transition challenges are grounded in first-generation students and their parents not being aware of institutional norms, common practices, and support networks (Pascarella et al., 2004). Further, the unanticipated rigor of academic coursework at the college level can make students feel uncertain and stressed (Godsoe, 2018). Finally, transitioning to college often means transitioning away from family, which can lead to "emotionally taxing" (Burns, 2013, p. 21) feelings of being an imposter or "family achievement guilt" (Covarrubias et al., 2015, p. 2031), which can result in depressive symptoms and lowered self-esteem. These challenges in transitioning to college further complicate first-generation students' retention and graduation rates.

The retention and graduation rates for first-generation students are staggering when compared to students whose parents are college-educated. Students categorized as first generation have a 71% higher risk of leaving college (Ishitani, 2003). Additionally, from a study of the 2003–2004 entering cohort, 33% of first-generation students had left the university 3 years later without completing a degree as compared to 14% of students whose parents had a bachelor's degree (Forrest Cataldi et al., 2018). Objective performance measures, including

GPA, tend to be lower for first-generation students, which may lead to higher attrition and lower graduation rates (Chen, 2005; Redford & Hoyer, 2017). The research displays comparisons of marginalized groups and those from affluent groups.

Marginalized students face a myriad of challenges when entering into and succeeding in college; however, research has indicated support programs provide pivotal assistance to these students in helping them succeed despite the barriers. Other factors contribute to access and success apart from socioeconomic status.

Gender Differences

Men and women are seeing differences in college enrollment. In 2012, there were approximately 2.8 million more women than men in college overall (i.e., 11,723,700 female students versus 8,919,100 male students; Garibaldi, 2014). A study of North Carolina public high school students and placement into rigorous college preparatory curricula indicated different opportunities for students from diverse gender and racial backgrounds and found these practices contributed to differential levels of achievement in freshmen college grades (Bottia et al., 2016). The gender gap is relatively small at high school graduation; it grows larger among young adults who enroll in college conditional on completing high school or a GED, and it is largest among people who complete college conditional on enrolling (J. Owens, 2016).

If male students' behaviors more strongly predict lower educational attainment for men today and gender egalitarian ideologies increasingly lead female students toward higher attainment, even a stable gender gap in early behaviors may help account for a growing gender gap in educational attainment (J. Owens, 2016). Although men are less likely than women to attend college, merely facilitating men's college enrollment is not enough to guarantee their educational attainment because men's experiences in higher education limit their persistence to

graduation (Ewert, 2012). It is imperative to counter unsubstantiated, self-fulfilling prophecies of students from varied races and genders by accentuating their intellectual abilities (Garibaldi, 2014).

Former president Obama reaffirmed his commitment to My Brother's Keeper, a big-picture initiative established in 2014 that addresses persistent gaps faced by boys and young men of color and helps all young people achieve their potential for college and careers (Sanacore, 2017). AVID has recognized a gender imbalance whereby more girls than boys participate in AVID programs, resulting in more girls (63% versus 37%) reaping the benefits of 4-year college preparation (Watt et al., 2017). In a study on the impact of college preparation for boys (Strayhorn, 2015), participants agreed that formal activities such as summer camps and rigorous courses provided the concerted cultivation necessary for Black men's college preparation and success in STEM. School-based activities and extracurricular programming could focus on providing students from less privileged social class backgrounds with targeted learning experiences designed to enhance self-efficacy and outcome expectations for math or science-oriented careers (Garriott et al., 2013). Gelbgiser and Alon (2016) demonstrated enrolling in math-oriented fields (e.g., STEM fields) is detrimental to the graduation likelihoods of all students, but especially to those of Black students, net of personal attributes, academic preparation, propensity to enroll in these fields, and institutional characteristics. In a study by Bounds (2017), results indicated career decision self-efficacy was significantly and positively correlated with ethnic identity and academic self-concept.

Psychosocial Factors

Research has shown attention being paid to psychosocial factors in the college admission process. In a study by Sparkman et al. (2012), empathy, social responsibility, flexibility, and

impulse control were predictors of student enrollment and graduation. Because measuring psychological factors allows institutions to identify more dimensions of student needs (e.g., motivation, self-management, propensity for social engagement), it is possible measuring psychological factors can lead to improvements in intervention effectiveness because institutions are able to align student needs with specific intervention programs (Allen et al., 2010). Psychosocial factors measure a student's cultural conventions, such as the values they reference from their parents to determine behavior and the set of values they uphold for themselves and their educational advancement (Cerna et al., 2009).

Learning disabilities (LDs) have been more common throughout the years because of the increases in diagnosis. Subsequently, students with LDs from disadvantaged backgrounds should receive college counseling and guidance with the application and enrollment process to decrease the likelihood of delayed college enrollment (Showers & Kinsman, 2017). Students with LDs from higher socioeconomic status families, who have higher educational expectations coupled with a strong academic background, have the best chance at succeeding in college (Showers & Kinsman, 2017).

Summary of Literature Review

The research areas reviewed in this chapter help connect them to the research question being asked in this study. The relevance of these areas involved multiple factors at play that impact first-generation, low-income students (see Table 1).

Table 1

Relevance of Research Areas

Research area	Relevance
Parent, family, and community	First-generation low-income students have no direct family experience when preparing for college. As a result, families may rely on community resources for guidance.
Networks and social capital	The social capital of community resources and role models impact opportunity for first- generation, low-income students.
High school rigor	Course selection in high school is critical to prepare for college. College admission offices evaluate the quality of a student's candidacy by performance in high school honors and advanced placement classes.
College preparation programs	Programs like Upward Bound can provide academic support and pathways to access college and be successful once there.
Testing	Scores on college admission exams like the SAT/ACT can determine the types of colleges students will be eligible to apply to.
College choice	There are different types of colleges. Understanding those choices (cost, major, careers) could help in finding the right college fit.
Retention and graduation rates	Transition to college and success once there is tied to preparation for college and how immersed a student becomes on campus.
Financial aid and socioeconomic factors	College cost and understanding how to pay for college is a huge factor for low-income families.
Gender gaps	Males and females are graduating from college at different rates. Understanding why will help professionals individualize assistance appropriately.
Psychosocial factors	Motivation, values, and support can impact academic success.

Chapter Three: Methods

This study aimed to identify factors critical to college success for first-generation, low-income students. Using the conceptual framework of constructivism, the relationships built between students and academic professionals can be key in shaping their future. This point is especially true with this student sample because they do not have the family history or social capital that promotes success. The research question of this study guided examination of secondary data from an Upward Bound program in the southeastern region of the United States.

Program Overview

Upward Bound is a federally funded program assisting first-generation, low-income students with their academic and social preparation for college to ensure high school graduation, college enrollment, and completion of a college degree (i.e., associate or bachelor's degree). At the time of the study, the program served 10 high schools in Hillsborough County, Florida (i.e., Blake, Chamberlain, East Bay, Hillsborough, King, Leto, Middleton, Jefferson, Robinson, and Tampa Bay Technical high schools). In some of these schools, a magnet program existed with specialty programming (e.g., Blake [Visual/Performing/Communication Arts], Hillsborough [International Baccalaureate], Jefferson [Business, Culinary, Law, Maritime], King [International Baccalaureate], Leto [Collegiate Academy], Middleton [Computer Game Design, Cyber Security, Engineering, Biomedical Sciences], Robinson [International Baccalaureate], Tampa Bay Technical [Architecture, Health, Veterinary]). The existence of these magnet schools, coupled with college preparation support from Upward Bound, strengthened the high school experience of the students studied in this sample. The Upward Bound program studied was one

of the longest-running programs in the United States. Given its longevity, the program staff had cultivated strong relationships at the schools mentioned and in the community. Program staff tended to stay employed with the program for extended periods, assisting with providing a consistent presence in the lives of program participants.

Upward Bound has six required services that all grantees must provide. Those services include academic tutoring; advising in course selection; assistance in preparing for college entrance examinations and college admissions; financial literacy inclusive of completing the financial aid application; guidance in alternative high school education programs (if needed); and curriculum instruction in math, laboratory science, foreign language, composition, and literature.

Academic Tutoring and Instruction

The Upward Bound program employed 10 instructors from the local school district and directly tutored students in their academic specialization. During the academic year, students attended 25 tutoring sessions on the campus of the Upward Bound program. Students could choose four academic core classes in which to receive assistance from 9:00 a.m. to 1:00 p.m. Tutoring sessions lasted 50 minutes, with a 5-minute rotation between classes. Transportation was provided to assist students in getting to campus, ensuring good attendance. In the summer, students submitted their future high school schedule for the upcoming school year and received instruction in five classes on material they would see once returning to school. The design was to ensure they had a good start in the new school year. Classes took place daily, Monday through Friday. Once the school year resumed, tutoring increased to provide additional support.

Advising in Secondary and Postsecondary Courses

Upward Bound employed two academic advisors with class loads of 60 students each. This model ensured the ability to build relationships with students, track student performance,

and meet periodically each month. Academic advisors visited the target each month to check on student academic performance and well-being. These meetings took place either in the guidance offices of each school or in the common lunch areas of the school. In the summer, students took a junior- and senior-year seminar that concentrated on components of the college application process (e.g., finding a college fit, choosing a major, writing college admission essays, identifying potential individuals to provide letters of recommendation, completing financial aid applications, discussing college life). Periodically, advisors would check in with parents to strengthen student–advisor–family connections. Advisors reviewed course registration in high school to ensure students were taking rigorous classes and to demonstrate to admissions staff the ability to do college-level work. Students were asked to research potential majors and course requirements for those disciplines.

Assistance with College Entrance Examinations and Admissions

College admissions is a new process for first-generation students. Academic advisors worked closely with high school seniors to complete college applications during program meeting times (e.g., Saturdays or after school). Access to technology and computers reduces the burden on families because students were able to use computers at on-campus computer labs. To best prepare for college exams, students took test preparation classes in SAT and ACT year-round to review content, test strategy, and simulate testing environments. Assistance in these areas provided students with access and opportunities to apply and be accepted into college.

Financial Literacy and Financial Aid Applications

Success in college and life involves exposing students to the importance of saving money, opening bank accounts, understanding good credit, and balancing a budget. These themes were embedded in program courses, like Junior and Senior Counseling, with interactive

opportunities to practice these concepts. The program worked directly with the financial aid office to offer students and parents the opportunity to complete the financial aid application together—doing so avoided errors and improper submission.

Core Curriculum Instruction

The Upward Bound program employs certified instructors, providing students who take rigorous classes with direct support via course instruction. Most instructors work directly in target schools, providing students with an additional layer of support inside the school. The program's contact hours in the classroom helped boost student grade point averages (GPAs), prepared students for the rigor of college, enhanced their academic profile for college admission, and benefited the long-term college graduation rates of this group.

Upward Bound also offered additional permissible services to students, including exposure to cultural events and activities, college tours, career exploration (e.g., work–study opportunities), summer residential experiences, mentoring program, and any activity to promote motivation and skills in students. The studied Upward Bound program took students on college tours to familiarize them with colleges across Florida, which helped students decide on best college fit. The program worked closely with academic departments on campus to expose students to academic majors and careers in those fields. Alumni of the program and community partners served as mentors for current students. An array of workshops were hosted, bringing in motivational speakers, financial planning experts, and leadership development activities. The Upward Bound experience is an academic, personal, and social transformation for students leading to student success.

Sample

The data set consisted of 202 Upward Bound students who graduated high school between 2009 and 2012. Students were selected for program participation based on the following criteria: (a) enrollment at a target school supported by the grant; (b) identification as a first-generation student (the first in their family with the potential to earn a bachelor's degree); (c) qualification as low-income, based on family taxable income; and (d) a grade point average between 2.0 and 2.5, determined from middle or high school grades at the time of selection into the program. Notably, in the 2007 Upward Bound grant competition, this particular program received delayed funding of 4 months (i.e., August 2007–November 2007) from the U.S. Department of Education, impacting the class of 2009 and 2010 (Students who were 12th and 11th graders at that time). All other participants were served normally.

The Upward Bound program application asks parents to identify their level of education, submit school transcripts for their child at the time of entrance, provide family income information, and include letters of recommendation. Of the 202 students in the sample, 163 went to college, and 39 never enrolled in college. The two comparison groups were students who enrolled in college and graduated versus those who enrolled but did not graduate.

Research Design

Ex-post-facto administrative data were used to determine student success factors related to college graduation. Student academic summary worksheets were analyzed to measure student GPAs (unweighted and weighted) at the time of high school graduation. In addition, these grade reports identified the amount of rigorous coursework (i.e., honors and AP) in which each student enrolled during high school. Upward Bound subscribes to the National Student Clearinghouse, which reports student enrollment and graduation status at institutions across the United States.

By mapping student progress in the National Student Clearinghouse, we determined college enrollment, 6-year graduation rates, and student areas of study. Active participation in Upward Bound was measured by reviewing program attendance records.

Research Question: To what extent do the following predictor variables relate to college graduation status for students participating in an Upward Bound Program?

- GPA at completion of high school (Unweighted and Weighted)
- Number of Honors classes completed in high school
- Number of Advanced Placement classes completed in high school
- Gender (coded 1 for Male or 2 for Female)
- Race (coded 1 for African American or 0 OTHER)
- College type (coded 1 for 2-year college vs. 2 for 4-year college)
- Program Involvement (Defined as 0 Not Active or 1 for Active in the program)

Final high school GPAs determined the threshold to be successful in college. Upward Bound reports on the percentage of students who take a "rigorous curriculum" in high school. Rigor is defined by the number of students who take honors and advanced placement courses. Student records are provided by the local school district, which partners with the Upward Bound program. These courses are good indicators of potential performance in college because of the similarity in rigor. Conversely, poor performance in these classes can be an indicator of a student who might face challenges once in college—especially for those who may not have taken any rigorous courses. Upward Bound provides a myriad of college preparation services year-round, so it was critical to explore if active participation in the program led to better college graduation rates. Active participation in Upward Bound for this study was defined as students who completed the program through to high school graduation and were present 80 percent of the

time to program services (20 out of 25 Saturday tutorial sessions during the academic year & 24 out of 30 summer program days).

The Upward Bound program reports annual postsecondary enrollment and completion data to the U.S. Department of Education. Data reflect 6-year graduation rates based on the type of school students attended (i.e., 2- or 4-year college). These data were used to examine the relation to success by college type to see if certain institutions might be better suited for first-generation, low-income students. Upward Bound supports students through high school graduation and college enrollment. All students receive the same type of services while enrolled in the program, facilitating the discussion of graduation rate differences between male and female students in a later chapter.

Null Hypothesis: There is no significant relationship between participation in the Upward Bound program, high school GPA, course rigor (honors/AP classes), gender, race, college type (2-year vs. 4-year), and the likelihood of graduating from college within six years among first-generation, low-income students.

Data Source

Data were gathered from the National Student Clearinghouse and student academic-summary worksheets. This step reduced any risk of bias or misrepresentation of student outcomes because the data were reflective of performance reports previously submitted to the U.S. Department of Education. The Clearinghouse is comprised of the enrollment and graduation status of students in college. The Upward Bound program also collects academic summary worksheets from students and the school district to track their progress in high school and evaluate the type of courses students are taking.

Variables

The dependent variable was college graduation. The independent variables included high school GPA (unweighted and weighted) and course rigor (i.e., quantitative variable) along with college type, gender, race, and program participation (i.e., nominal variables).

Instruments and Measures

The instruments used in this study are academic summary worksheets provided by the school district served by Upward Bound. The other was the National Student Clearinghouse, which contains participants' enrollment and graduation data. Academic Summary worksheets are a snapshot of a student's overall performance in high school. It captures a student's grade level, courses taken, grade point average, test scores for state assessments in core subject areas, class rank, PSAT, SAT, and ACT scores. For the purpose of this study, the instrument was used for grade point averages and performance in rigorous courses like advanced placement and honors. The National Student Clearinghouse is a national database that houses college enrollment status, number of credits enrolled in by semester, and major of study. For the purposes of the study, the National Student Clearinghouse was used to capture college enrollment, degree completion, and area of study. The Upward Bound program maintains student demographic information and attendance to program services as required by the grant allowing for the other data points needed for evaluation.

Data Collection Procedures

When students apply to the Upward Bound program, parents provide written consent to release their academic records to the program from the time of participation and up through college graduation. Academic data from each student in cohorts from 2009–2012 ($N = 163$) were collected from the program in the form of a data request where there were no direct identifiers

for confidentiality. The variables in the study were coded as follows: Grade Point Average range of 1.96 (Minimum GPA) and 6.45 (Maximum GPA). The number of Honors classes a student took while in high school was a range of 0 (Minimum Honors classes) and 34 (Maximum Honors Classes). The number of Advanced Placement classes was a range of 0 (Minimum AP classes) and 12 (Maximum AP classes). For context, the number of classes represents the courses students took each semester while in high school. In a 4-year cycle a student would have taken 8 semesters worth of classes and why we see such high ranges due to the multiple Honors and AP classes a student took over that time. Program involvement was coded as 0 (did not meet the definition of active involvement in the program defined as more than 5 absences in the academic year and 3 absences in the summer) or 1 (no more than 5 absences in the academic year and 3 absences in the summer). The more active a student participated meant the more treatment or exposure to program services they received. College type was coded as 1 (2-year Community College) and 2 (4-year College or University). Gender was coded as 1 (Male) and 2 (Female). Race was coded as 0 (Other) and 1 (African American). We had a predominantly African American sample. 6-year College graduation was coded as 0 (did not graduate from college) or 1 (did graduate from college).

Data Analysis

The data collected were analyzed using SPSS. Descriptive statistics of the data sample were presented to understand the demographics of the study. I performed a series of independent *t* tests, chi-square tests, and a stepwise logistic regression to measure the relationship between each variable (bivariate) and all variables combined (multivariate) to determine a relation to college graduation. Screening of the dataset took place to address issues with variables that had a very large range and were not normally distributed per Kurtosis and Skewness values. A

truncating approach was then used adjusting for any value greater than 2 standard deviations above the mean.

- GPA at completion of high school (Unweighted and Weighted)
- Number of Honors classes completed in high school
- Number of Advanced Placement classes completed in high school
- Gender
- Race
- College type
- Program Involvement

Each of these variables became predictors of college success. T-tests measured the mean difference between our two groups being studied (graduated v. not graduated). Chi-Square tests compared whether our observed results were expected and statistically significant. Stepwise Logistic regression allowed for the measurement of each variable while controlling for the other variables to determine each variables significance. Stepwise Logistic regression was ultimately selected due to its interpretability and the ability to provide clear insights into the relation of each predictor with the categorial outcome variable graduation status (graduated vs. did not graduate). The types of majors students pursued provided career path information for the sample. The evaluation of results allowed for the determination of significance of our variables and study overall.

Ethical Concerns

The use of secondary data in this study raises important ethical considerations, particularly regarding participant privacy and informed consent. The data obtained from the National Student Clearinghouse and Academic Summary worksheets were fully anonymized and

de-identified, ensuring that no personal identifying information was accessible to the researcher. Moreover, all participants in the original data collection had provided informed consent for their data to be used in subsequent research. This study complied with all Institutional Review Board (IRB) guidelines to protect participant confidentiality and uphold ethical research standards. Aggregate data kept by the Upward Bound program for reporting purposes were reviewed to examine student GPAs, high school rigor, active participation in program, college type, gender, and race. Data were presented anonymously (i.e., numbered 1–163) to ensure student identity was kept confidential.

Summary

First-generation low-income students face social and academic barriers in receiving a quality education. Understanding which factors in high school yield higher college graduation rates can help high school and higher education professional's work with this population. The analysis of data in this study added to existing literature by focusing on the type of interventions that appear statistically significant when it comes to advising, mentoring, and coaching first-generation, low-income students. The goal is to move from systemic barriers to understanding how to navigate a complex education system to position students for success. Creating a network of education professionals and shape that help first-generation students construct new knowledge that provides the skills and motivation needed to be successful in college.

Chapter Four: Results

This study determined how high school grade point average (unweighted and weighted GPA), course rigor, college type, gender, race, and program involvement related to college graduation rates. The study sample started with 202 high school students who participated in an Upward Bound program in the southeast region of the United States from 2009–2012 (see Table 2). Of the 202 students who graduated high school, 163, or 81%, entered college by the fall semester immediately following graduation from high school. Nationally, 942 Upward Bound programs existed during this timeframe, with a collective college enrollment rate of 82% (U.S. Department of Education, 2012).

Table 2

Sample Demographics by Graduation Status (n=163)

Demographic	*n*	Graduation %	Did not %	
Gender				
Male	48	37.5	62.5	Chi-square test
Female	115	66.1	33.9	11.34***
Race/Latino				
African American	127	57	43	
Other	36	61	39	.224
White	4	25	75	
White/Latino	27	66.7	33.3	
Asian	5	60	40	
Program Involvement				
Active	133	62	38	
Non Active	30	40	60	
				4.70*
College Type	51	35.4	64.6	
2-year	112	67.0	33.0	15.22***
4-year				

Table 2 (Continued)

Note. The sample has a 57.7% overall 6-year college graduation rate. 2-year college represents students who started at a Community College and graduated with an Associate's Degree. 4-year represents students who started at a University and- earned a Bachelor's degree

*$p < .05$. **$p < .01$. ***$p < .001$.

The 163 students were tracked in the National Student Clearinghouse for 6 years, and 94 students (57.7%) went on to graduate from college in 6 years. Nationally, 47% of students in 942 Upward Bound programs during this timeframe graduated in 6 years (U.S. Department of Education, 2018). I began by comparing the bivariate relationships between each student demographic variable and graduation status (no vs yes). Female students were significantly ($p <$ .001) more likely to graduate (66.1%) than male students (37.5%). Students who were active in Upward Bound graduated at a significantly higher rate ($p < .05$) compared to students who were not active with 62% of students who were active in Upward Bound program services graduating versus 40% of students who were less active. The more active a student was while in the program offered additonal exposure to program services. Those services included academic tutoring and instruction, academic advising, preparation for college entrance exams, financial aid assistance, financial literacy, college tours, and a residential overnight experience in the summer. Active students (i.e., students who remained in the program from entry through high school graduation and did not miss more than 5 days during the academic year and 3 days during summer) received 100 hours of direct services during the academic year with another 150 hours in the summer. Significantly higher 6-year graduation rates were seen at 4-year colleges (67%) than at 2-year colleges (35.4). See Table 2 for details of the chi-square tests.

For students who went to college ($n = 163$), the average UGPA was a 2.9 and WGPA 3.69; students took an average of 11.48 honors classes and 2.78 AP classes. The mean UGPA for students in this sample who graduated from college was a 3.10 compared to 2.64 for those that

did not graduate. The mean WGPA for students in this sample was 4.03 compared to a 3.23 for those who did not graduate. This difference was statistically significant ($P < .001$) based on the results of an independent samples T-test. Students who graduated took an average of 12.63 honors classes compared to 9.90 honors courses for those who did not graduate. The difference was not statically significant ($p < .05$). College graduates averaged 3.20 AP classes in high school compared to 2.20 for those that did not graduate (see Table 3). This difference was statistically significant ($P < .05$) based on results of an independent samples t-test (see table 3).

When evaluating for kurtosis, values of zero indicated a normal distribution, a positive kurtosis (greater than 0) indicated the sample distribution has more outliers, and a negative kurtosis (less than 0) indicated that there are fewer outliers. Skewness tells us about the balance of our dataset, while kurtosis uncovers the tails, showing us how much our data diverges from the ordinary. The dataset was truncated to ensure Kurtosis and Skewness of our dataset met the -1 to 1 distribution.

Table 3

Descriptive Statistics for Quantitative Variables by Graduation Status

Variable	Total (n = 163)	Graduation Status: Did not graduate (n = 69)	Graduation Status: Graduated (n = 94)	Independent samples t-test
High School GPA (Unweighted)				
Mean	2.90	2.64	3.10	t = 7.99***
Median	2.92	2.52	3.11	
Kurtosis	-.924	1.22	-.545	
Skewness	.139	.969	-.326	
SD	.430	.345	.378	
Min.	2.07	2.08	2.07	
Max.	3.90	3.84	3.90	
High school GPA (Weighted)				
Mean	3.69	3.23	4.03	t = 5.99***
Median	3.50	3.12	3.83	
Kurtosis	-.195	-.386	.065	
Skewness	.461	.690	.500	
SD	0.94	0.82	0.87	
Min.	1.96	1.96	2.17	
Max	6.45	5.48	6.45	
Number of Honors Courses				t = 1.57ns
Mean	11.48	9.91	12.63	
Median	10.00	8.00	11.50	
Kurtosis	-.107	-.697	-1.07	
Skewness	.467	.685	.301	
SD	10.97	9.9	11.61	
Min.	0	0	0	
Max	34	34	34	
Number of AP courses				t = 1.65*
Mean	2.78	2.20	3.20	
Median	.000	.000	.000	
Kurtosis	.007	.840	-.445	
Skewness	1.06	1.01	.986	
SD	3.85	3.39	4.12	
Min.	0	0	0	
Max	12	12	12	

Note. *p < .05. **p < .01. ***p < .001. The skewness and kurtosis values for the data fall within the acceptable range for normal distribution, as outlined by Bulmer (1979). Specifically, skewness between -1 and 1 and kurtosis between -1 and 1 are considered normal.

Next, I compared students who graduated versus those who did not graduate on four quantitative variables: high school GPA (unweighted & weighted), number of honors courses taken in high school and number of AP courses taken in high school. Table 4 provides the correlations between these four variables. The correlation analysis reveals several relationships between GPA and academic rigor. **Weighted GPA (WGPA)** shows moderate to strong correlations with both **Honors** ($r = 0.584$, $p < 0.01$) and **AP** courses ($r = 0.639$, $p < 0.01$), suggesting that students with higher weighted GPAs are more likely to have participated in these advanced courses. This affirms the purpose of weighted GPA, which accounts for course difficulty and rewards students for taking challenging classes. In contrast, **Unweighted GPA (UGPA)**, which does not consider course rigor, has a weaker correlation with AP courses ($r = 0.159$, $p < 0.05$) and an almost no correlation with Honors courses ($r = 0.074$, not significant). The correlation between UGPA and WGPA ($r = 0.601$, $p < 0.01$) is moderate, indicating that while related, the two GPA measures capture different aspects of academic performance. Overall, these results suggest that weighted GPA is a better reflection of students' engagement with rigorous coursework compared to unweighted GPA.

Table 4

Variable Correlations (n=163)

GPA and Rigor	UGPA	WGPA	Honors	AP
Unweighted GPA	1	.601**	.074	.159*
Weighted GPA	.601**	1	.584**	.639**
Honors	.074	.584**	1	.638**
AP	.159*	.639**	.638**	1

Note: GPA is measured at high school graduation, Honors is the number of courses taken in high school, Advanced Placement is the number of AP classes taken in high school.
*$p < .05$. **$p < .01$. ***$p < .001$

Table 5 demonstrates the types of colleges that Upward Bound students attended. The 4-year colleges represent a variety of competitive institutions that most likely contributed to success once there. The majority of students who enrolled into college attended Florida Agricultural and Mechanical University (32), Florida State University (16), University of South Florida (10), St. Leo University (9), Bethune-Cookman University (8), University of Central Florida (6), and Florida Gulf Coast University (6). For those that went to two-year colleges, the majority attended Hillsborough Community College (43). Students who attend 2-year colleges often tend to stay home during the college experience and take on additional family and work responsibilities.

Table 5

Colleges Enrolled Into by Upward Bound Students x Majors

2 Year	4 Year
Central Piedmont (1)	Bethune-Cookman University (8)
Ellsworth Community College (1)	Clark Atlanta University (1)
Hillsborough Community College (43)	CUNY Borough of Manhattan (1)
Norfolk College (1)	Florida Agricultural & Mechanical University (32)
Piedmont Virginia Community College (1)	Florida Atlantic University (1)
St. Petersburg College (2)	Florida Gulf Coast University (6)
Tallahassee Community College (1)	Florida International University (4)
Tyler Community College (1)	Florida Memorial University (2)
	Florida State University (16)
	Full Sail University (1)
	Howard University (1)
	Northern State University (1)
	Norwich University (1)
	Paine College (1)
	Park University (1)
	Radford (1)
	St. Leo University (9)
	University of Central Florida (6)
	University of Florida (3)
	University of Maryland (1)
	University of Nebraska (1)
	University of South Florida (10)

Table 5 (Continued)

	University of Tampa (1)
	University of West Florida (1)
	Waldorf College (1)
	Warner University (1)

Note. This table reflects the number of students that attended either a 2-year community college or 4-year college or university. Graudation from either type of insitution was considered when evaluating college graduation rate.

In the final analysis I examined the effect of the eight predictor variables on the college graduation status of students. Stepwise logistic regression was used since the outcome was a categorial variable with two outcomes (did not graduate vs. graduated). The relationship between each predictor and the outcome was evaluated statistically controlling for the other seven predictors in the model. Using a .05 significance level, three predictors **(Unweighted GPA, Active Participation, Gender)** were signficicant related to graduation status. The model achieved an R-squared value of 0.357, indicating that approximately 35.7% of the variance in graduation status is explained by the predictors. **State GPA** is a significant and highly impactful predictor of college graduation, with a p-value of 0.004, below the 0.05 threshold. The odds ratio for State GPA is 9.18, indicating that a one-unit increase in State GPA is associated with 9 times the odds of college graduation. This strong effect suggests that State GPA is the most influential factor, underscoring the importance of academic performance in determining the likelihood of college success. **Participation** in Upward Bound is another significant predictor, with a p-value of 0.008 and an odds ratio of 4.28. This result implies that individuals with higher levels of participation in the program have over four times the odds of graduating from college compared to those with lower levels of participation. Active involvement in the program is likely a substantial contributor to college success. Gender is also identified as a significant predictor, with a p-value of 0.032 and an odds ratio of 2.621. This suggests that one gender has approximately 2.6 times the odds of college graduation. The significant impact of gender

highlights the need for further exploration to understand the underlying factors contributing to this disparity between males and females. Other non-significant predictors (**WGPA**, **HONORS**, **AP**, **Type**, and **Race**) do not show statistically significant relationships with college graduation, as their p-values exceed the 0.05 threshold. These results highlight **State GPA**, **Participation**, and **Gender** as the most influential factors associated withcollege graduation. **State GPA** and **Participation** stand out with high odds ratios, suggesting that these variables strongly influence the likelihood of college graduation. This finding underscores the importance of academic achievement (State GPA) and active involvement (Participation) as crucial elements that enhance the likelihood of success. The significant effect of **Gender** suggests further research needed to explore these disparities.

Table 6

Logistic Regression Results Predicting Graduation Status (n=163) with both unweighted and weighted GPA in the model, R-squared .357

Variable	P-Value	OR	95% CI Lower	95% CI Upper
UGPA	.004	9.18	2.05	41.25
W GPA	.130	2.34	.779	7.00
Honors	.591	.984	.929	1.04
AP	.316	.921	.784	1.08
College type	.154	2.10	.757	5.81
Gender	.032	2.62	1.09	6.32
Active	.008	4.28	1.45	12.59
Race	.751	.838	.280	2.50
Constant	< .001	.001		

Note. Upward Bound students in this sample were 9 times more likely to graduate from college with higher unweighted GPAs, 2 times more likely if female, and 4 times more likely if active in the Upward Bound program while in high school. VIF value for the Regression was well under the common threshold of 5 indicating no multicollinearity among the independent variables (O'Brien, 2007).

When calculating for Variance Inflation Factor (VIF) [VIF≈1.56]. A VIF of 1.56 signifies low multicollinearity associated with the independent variable in question making the model predictions more reliable. Generally, a VIF above 5 or 10 indicates problematic multicollinearity,

Response to the Null Hypothesis

Based on the results of the study, the null hypothesis, which states that there is no significant relationship between participation in the Upward Bound program, high school GPA, course rigor, gender, race, and college type with the likelihood of graduating from college within six years, is rejected. The findings demonstrate statistically significant relationships between several variables and college graduation rates. Students who had higher unweighted GPAs, actively participated in the Upward Bound program, and were female had higher 6-year college graduation rates. Therefore, the alternative hypothesis is accepted, indicating that these predictor variables do have a significant effect on 6-year college graduation rates for first-generation, low-income students.

Summary

In all, 57.7% of Upward Bound students who enrolled in college graduated within 6 years. That figure was double the national average for first-generation, low-income students, which has hovered around 20%. Upward Bound students in this sample who graduated from college and finished high school with a profile reflecting higher GPA's, having taken more rigorous courses, and female (especially African American female students) were very successful. An emphasis on rigor in high school definitely prepares students for the academic expectations of college. The significant variables in this study were UGPA, gender (i.e., female students), and program participation. Males had lower graduation with only 37.5% of the sample graduating from college. The total number of men in this sample was low, but nationally, men's

college enrollment and college degree attainment are lower than women's enrollment. Active participation in Upward Bound influenced college graduation, indicating students with higher activity levels graduated at higher rates than those who did not. A discussion of these results follows in Chapter 5.

Chapter Five: Discussion

Upward Bound programs began in 1964 and prepared many first-generation, low-income students for college success. Not having a family history or knowledge of the college-going process, coupled with financial stressors, creates major barriers to success for first-generation, low-income students. Services that Upward Bound students receive include academic advising, tutoring, financial aid assistance, test preparation, college tours, college application fee waivers, SAT and ACT test waivers, and a summer residential component. In this study's sample, 163 enrolled in college, with 94 students graduating within 6 years for a 58% rate. Nationally, only 20% of first-generation, low-income students graduate from college (National Center for Education Statistics, 2018).

Upward Bound students in this sample graduated at nearly 3 times the average for the same population. When comparing these results to the general population, about 62% of students who began seeking a bachelor's degree at a 4-year institution in Fall 2012 completed that degree at the same institution within 6 years; the 6-year graduation rate was higher for women than for men (i.e., 65% versus 59%; National Center for Education Statistics, 2020). Several key factors are worth noting. Academic preparation for college includes simulating course rigor for students in high school by taking honors and AP courses.

The GPA variable proved to be statistically significant in this study ($p < .001$). Students in this sample, on average, took 11 honors and 2 advanced placement (AP) classes, with any increase in those variables amounting to higher high school GPAs and college graduation rates. High school students with intentions to enroll in college should challenge themselves with course

rigor. Students can begin taking rigorous courses, especially Math and English, as early as eighth grade. By simulating the rigor high school students will encounter in college, students will be prepared for the transition to college. In addition, families should seek out support from high school personnel who can provide referrals to college preparation programs like Upward Bound, College Reach Out, Talent Search, and Gear-Up. Participation likely influenced other variables by enhancing students' engagement and commitment, which may positively impact academic performance and involvement in rigorous coursework. Families need to be empowered with information, so building relationships with parents or guardians is important. Obtaining and maintaining good GPAs while in high school allows students to apply to selective colleges; these environments provide students with resources and experiences that increase their chances of graduating. Students in this sample who did not graduate from college were less likely to take rigorous courses. Active participation in Upward Bound showed significance when students combined taking rigorous courses with services like tutoring to aid in their success in those courses. Continued academic support in high school when enrolled in programs like Upward Bound allows students to simulate a college experience and improve their college readiness.

Upward Bound students found the most success by attending 4-year universities with a 67% graduation rate from these colleges. Having campus programs focusing on student success is key to the university experience and leads to student retention. For example, the goal of student support services (i.e., another TRIO program) is to increase college retention, transfer rates into baccalaureate programs, and graduation rates of its participants (Sabay & Wiles, 2020). Just like Upward Bound, these programs focus on creating knowledge for students on navigating the college system by building relationships with college personnel who provide access to tutoring, advising, counseling, and career preparation—important factors for first-generation,

low-income students. If a student begins their college journey at a community college, they should consider entering programs that provide institutional support. Students in this sample graduated from community colleges at a 35% rate. Often, having personnel who can provide a culture of care and accountability is important. Community college offers a good financial option for low-income families where tuition rates are typically half the price of attending a 4-year university. Financial aid will go further for students in a 2-year setting. To assist college students in gaining financial skills, many colleges offer financial education through orientations, online webinars, counseling, workshops, and personal finance courses (Eichelberger et al., 2019).

Challenges of attending community college include balancing other life responsibilities like work, supporting their families, and being present to assist with siblings. These reasons are likely why the graduation rate of students attending 2-year colleges in this sample was 35%. Students attending community college should seek out pathway programs that prepare them to transfer to 4-year colleges upon completion of an associate degree. Providing a clear focus on major and credit transfer into a 4-year institution helps them stay on task and motivated to complete the process. Students who attended out-of-state institutions did well, given the cost factors compared to in-state options. Perhaps students in this sample who decided to study out of state went into college with a specific interest or reason for making that decision, which led to the 66% graduation rate. Students in this sample who did not graduate were more likely to attend community college.

Based on these findings, families should do research and seek out institutions with good graduation rates. Providing access to internet and computers allows for informed decisions to be made. College is a major financial investment, especially for low-income families, so the more prepared students are for the realities of pursuing a college degree, the better. In general,

including families in preparation for college helps by providing knowledge and information to manage the process and ease the fears and misconceptions of pursuing and paying for a college degree.

Similar to national data, female students in this sample fared better than male students in college graduation (i.e., 66% versus 36%). Looking closely at the data, female students in this sample had higher GPAs, took more rigorous courses, and were more likely to attend a 4-year institution. Data suggested that male students may need additional mentoring and coaching to enter into college prepared and with a plan for success. Research indicates that male students, particularly those from underserved backgrounds, often benefit from targeted mentorship and support to address unique barriers to college readiness, including academic preparation and planning for college success (Harper & Harris, 2012). Female students tend to employ more organized study strategies, seek academic support, and exhibit higher levels of intrinsic motivation, all of which contribute to their academic success compared to their male counterparts (Conger & Long, 2010). Female students are more likely to utilize academic resources and seek help from professors and peers, which positively impacts their academic performance and persistence in college (Elias et. al. 2010). The conceptual framework of constructivism suggests men need direct attention, services, and support to help them develop positive outlooks on college and careers. In general, when comparing students who graduated versus those who did not, students who earned degrees did better across all variables (i.e., GPA, honors, AP, program participation, attended 4-year institutions).

This particular Upward Bound program had such a positive influence on the target high schools it served that today some are no longer target schools. Upward Bound worked with area high schools that demonstrated lower high school graduation rates, lower college-going rates,

and where the student population qualified for free and reduced-priced lunch. For example, Tampa Bay Technical High school has become an "A" rated school, in part because of a college and career culture supported by the Upward Bound program. Of course, the school is doing many things well, but Upward Bound is part of that success story. Middleton, which is still a target school, has increased its grade from a "D" in 2009 to a "B" in 2024. Through partnerships like the one seen with Upward Bound, school performance increased and a culture of success became the norm.

In a review of the majors of the 94 students who graduated from college, the degrees earned are categorized into interdisciplinary (5), business (29), health sciences (39), education (6), social science (23), arts and communication (5), and engineering (8). The three most popular majors were health sciences, business, and social sciences (see Figure 1).

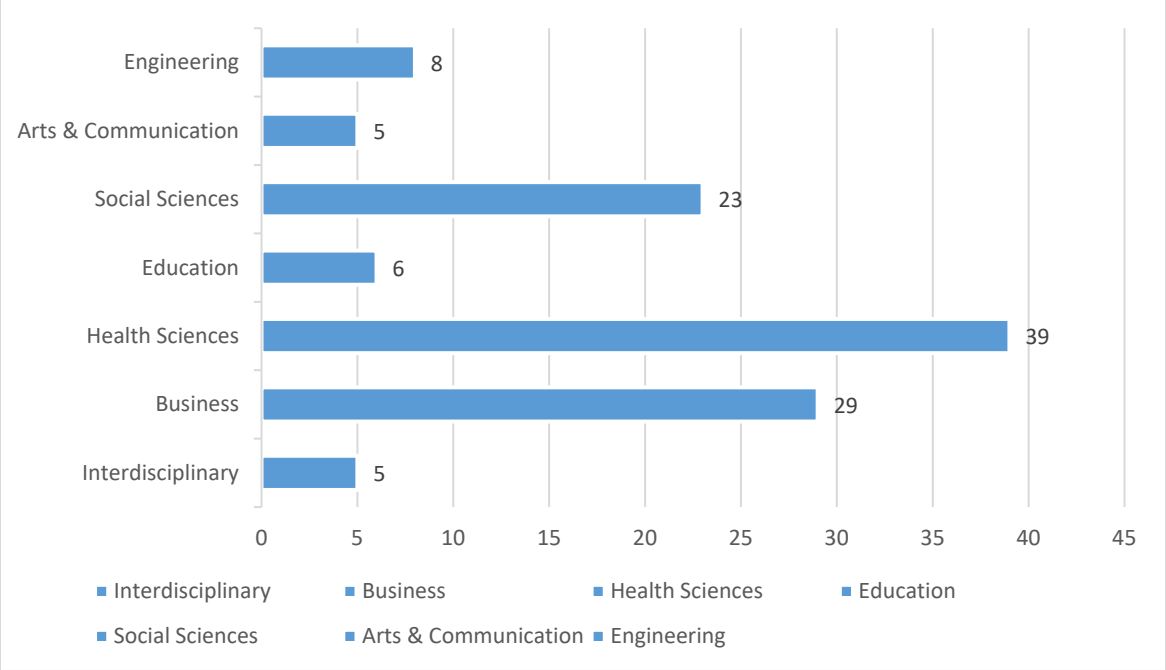

Figure 1. Degrees by major. The majority of students majored in Health Sciences, Business, or Social Sciences. Major Exploration while in high school in general is important with emphasis in these areas could be beneficial.

Implications

The study provides key implications based on the findings of the impact of the Upward Bound program on the college graduation rates for first-generation low-income students. The Upward Bound program studied is highly effective in supporting first-generation low-income students as seen in the college graduation rates of this cohort being three times the national average for similar students. Finding local Upward Bound programs for interested families is critical to college success. Academic rigor in high school played a crucial role in predicting college success. Students who took more honors and AP classes helped produce higher GPAs and were more likely to graduate from college. This suggests that high schools should encourage low-income students to pursue rigorous courses early on in high school to improve their GPA and simualte college rigor. Continuous individual support throughout high school and college is crucial for student success, emphasizing the importance of ongoing mentorship and academic assistance. Addressing gender disparaties are needed given the overwhelming evidence that female students in this study had higher college graduation rates than their male counterparts. This highlights a need to develop targeted strategies to support male students in their academic college persistence and graduation rates. First generation, low-income students can be helped by addressing and shaping policies that improve college affordability. Policymakers should consider incentivizing college attendance for low-income students by offering grant funds and improving affordable higher education options. Strengthening early academic preparation, enhancing personalized support, and addressing financial and gender-specific challenges can significantly improve college graduation outcomes for first-generation, low-income students.

Recommendations for High School Personnel

High school personnel should closely monitor the course selection of students with intent to go to college to ensure they are on a college preparatory track. This step includes having continuous advising sessions to discuss progress and guide students to resources that provide support. By taking AP and honors courses in the high school curriculum, students can earn college credits early while reducing financial costs before arriving on campus. Often, the student–counselor ratio is high, and the needs of first-generation low-income students can be overlooked. According to a survey by the American School Counselor Association (2020), of high school guidance personnel nationwide, the student-to-school-counselor ratio is 430 to 1. The recommended ratio is 250 to 1, and this Upward Bound program studied has a 60-to-1 ratio, allowing more time for individual assistance. School counselors take on various roles in school, such as course scheduling and testing, which limits time that allows for college planning. Sometimes, college preparation gets lost with other priorities in high school, such as meeting high school graduation requirements. For example, high school exit exams shape college enrollment by diverting attention away from ensuring students are academically prepared for college and instead focus on obtaining the minimum academic requirements for graduating from high school (Perna & Thomas, 2009). As high school administrators and counselors determine the efficacy of college support systems for first-generation students, high schools and colleges need to focus more intensely on increasing the emotional and academic success of their students (Sanacore, 2017). School districts should support more college and career counselors to address the individual long-term goals of students.

The Florida Department of Education (https://www.fldoe.org/academics/college-career-planning/) provides an array of resources for school counselors and students to use for goal,

college, and career planning. College and career workshops should be visible in communities to market college matriculation and afford low-income families skill-based certificate programs, promote postsecondary achievement, and change the "language" from hopelessness in such communities to opportunity and achievement (Crutchley, 2023). Family engagement is important, so high school personnel should create workshops and seminars to keep students informed about the process of going to college. These seminars should focus on college admission requirements and financial aid information to explain ways to pay for college. These sessions should be interactive, with access to complete college and financial aid applications in person. High school personnel should also have community resources and relationships that are strategic to student success. Creating a pipeline to support programs like Upward Bound helps provide additional opportunities and resources that might not be directly available at the school. Connections to college programs that directly support first-generation, low-income students allow for the social capital needed when serving this population. TRIO personnel working with pre-collegiate students should research college TRIO programs and guide students to consider attending institutions where continued support will exist. The U.S. Department of Education publishes the TRIO footprint map of programs across the nation (https://ope.ed.gov/programs/maped/storymaps/trio/), which provides a blueprint of locations for continued support.

First-generation, low-income students would benefit from cultivating leadership skills. Connecting students to mentors, especially individuals with established careers, could help provide support and motivation. An important leadership quality first-generation, low-income students lack is asking for help. To overcome imposter syndrome, these students need to feel a sense of entitlement and belonging to help them develop a "student identity" (Chapman, 2017, p.

113). Keeping close relationships with males is paramount, so they are part of the progression taking place and entering college with stronger academic standing.

Recommendations for College Personnel

The college admissions landscape has continued to get competitive among many institutions of higher education seeking the best talent. College personnel should offer pathways to college for first-generation, low-income students. This recommendation involves actively recruiting students and creating relationships with high school personnel and community-based programs. Similar to the federal TRIO student support services programs, institutional initiatives that serve this population help with their transition to college by having a support network once there. Campus-based initiatives and strategies to assist first-generation students should take into account cultural nuances and cultural barriers within the context of students' familial class-based norms and racial/ethnic identities (Chandra et al., 2020). Developing programs that serve male students could help close the gap between female and male student achievement by assessing challenges male students face during their undergraduate experiences.

Professional development seminars and conferences focused on the needs of first-generation, low-income students would help ensure faculty and staff have the skills to best serve these students. An institutional commitment to student success is key to creating a culture that believes in the philosophy that each student has unique needs.

Here is a summary of the recommendations:

- Help students understand the improved quality of life obtained by going to college.
- Encourage students to take rigorous coursework.
- Invest time into test preparation strategies.
- Advocate that schools invest additional time for college preparation.

- Create financial literacy programs for families.
- Expose students to college-related activities and peers who have similar goals
- Connect students with mentors.
- Refer students to programs who can serve as resources in the college preparation process.
- Create programs in high school and college that serve first generation, low-income students.
- Provide ongoing professional development opportunities for staff that assist in understanding the unique needs of first-generation, low-income students and the challenges faced by these groups in college attainment.
- Monitor the progress of male students and their needs throughout the education pipeline.
- Projected GPA intervention, including projected GPA models to show students what their GPA will be when they graduate high school based on their current cumulative GPA and the number of classes they have taken and have left.

Public Policy

Financial support of 4-year public institutions has seen decreased state appropriations over the years, with some states moving to a performance-based funding model. In this reality, public institutions compete for funding based on performance metrics such as retention and graduation, which enhances student services and creates a model where enrollment becomes highly selective. It is imperative that institutions make efforts to maintain enrollment opportunities for first-generation, low-income students who are often a vulnerable, marginalized group. Perhaps incentivizing the college-going process by giving students grant funds for college

would help ease the financial burdens on low-income college students. This study has shown students can be successful with support.

TRIO, which consists of a group of federal programs (i.e., Upward Bound, Upward Bound Math Science, Veterans Upward Bound, Talent Search, Student Support Services, Ronald E. McNair Scholars Program, Education Opportunity Centers), provide services to first-generation low-income students throughout the education pipeline. Success in securing continued funding over the years is in much part due to the advocacy of its national association: the Council of Opportunity in Education (COE). Based in Washington, DC, COE maintains relationships with key congressional and senate leaders by consistently sharing the stories of TRIO alums and organizing efforts to hear from constituents across the country on the accomplishments of its programs. TRIO programs have received bipartisan support for some of the most vulnerable citizens because their services span all communities across the United States. Funding for TRIO stands at $1.2 billion, consisting of over 3,000 programs serving over 880,000 students. Long-term funding for first-generation, low-income students needs continued advocacy and support from organizations like COE. Having an organized approach in this manner has led to the sustainability of TRIO.

Building a Constructivist K–12 Pipeline

Students begin to construct meaning about their education and future opportunities through their experiences and relationships beginning in elementary school. Given this point is where youth and adolescents spend a good bulk of their time, it is imperative that educators and students work collaboratively on building essential competencies. Reading and writing are components of success in the education pipeline, so concentrating on these areas will benefit students. Teaching students healthy communication strategies is an area that could help students

promote help-seeking behaviors, especially for male students. Educators should seek out professionals from various industries to speak to students periodically about their careers, which will help students hear success stories and build confidence to forge their paths. In middle school, study skills and time management become key. Learning to be efficient and consistent becomes the important next step in getting good grades.

Educators should work with students to help them plan their days, weeks, and assignments. These ownership and accountability skills become prevalent later in college. Identifying potential high schools, especially with academic specialties and magnet programs, will set the tone for college and career readiness. In high school, educators must convey that performance matters—each course grade is important to college admissions. Taking rigorous courses and performing in them are indicators of success in college. Individualized attention and counseling would help students in the college planning process, which is where links to college preparation programs (e.g., AVID, Upward Bound, College Reach Out, Gear-Up) provide extra support and resources. High school is a time to explore and self-evaluate skillsets to narrow the college search process.

Limitations

This study included 202 students (163 of which enrolled in college) from the southeast region of the United States. A larger sample and a national study would help assess if these results are generalizable to other high school students. A sample with more men would also help to assess if these results stand in a greater context. In addition, the class of 2009 was impacted by delayed program funding, which halted program services for 4 months (August–November 2008). The amount of time it takes to obtain a degree—coupled with other life factors—may hinder college success, but that impact was not measured. Other factors like activities and

services outside of Upward Bound or within their own respective high schools were not measured as to how that contributed to college graduation. Family support (single-parent, two-parent, or extended family) or economic differences could have affected these factors as well.

Limitations in scholarly writing refer to potential weaknesses in the researcher's study that are beyond their control (Simon, 2011). I understand and acknowledge the current study posed certain limitations. The target audience for this study included data from participants of one Upward Bound program. Although results are generalized, given the overarching and pervasive obstacles this population faces and the uniform objectives to which all Upward Bound programs adhere, there was still the limitation of the sample. Another limitation of this study is the absence of data on students who dropped out before graduating from high school. This could introduce selection bias, as the study only examines students who successfully graduated high school and enrolled in college. To fully understand the impact of Upward Bound on all participants, future research should include students who did not complete high school or transition to college. Also, the study does not acknowledge if any of the students that did not enroll into college perhaps chose to take a gap year for a variety of life reasons. Additionally, the study's reliance on quantitative data limits its ability to capture the socio-emotional factors that play a crucial role in student success. A mixed-methods approach, incorporating qualitative interviews or case studies, could provide a more holistic understanding of how Upward Bound influences student outcomes. Finally, Simon (2011) defined snapshots in a given study as being "dependent on conditions occurring during that time. Although the Upward Bound program provides specialized services to assist students to persist through college, even after exiting the program, there are still various obstacles when they arrive on campus. Due to Upward Bound programs being unable to provide services to students after high school graduation, data

pertaining to college persistence and graduation include dependent variables uncontrollable by the Upward Bound program.

Contribution to Existing Literature

Various past research has studied the effectiveness of Upward Bound. In a study by Mathematica Policy Research (2009), Upward Bound significantly increased college attendance rates, especially for students with lower academic preparation. In a comparison study between Gear up and Upward Bound (Winston & de Alva, 2001), found that Upward Bound contributes significantly to preparing disadvantaged students for college, especially by improving their academic preparedness and motivation. Perna & Swail (2003) found Upward Bound was particularly effective for minority students who needed both academic support and personal empowerment. Angrist & Levy (2009) studied college attendance and found Upward Bound is most effective in helping students gain college access but that additional support may be needed to improve degree completion. Cabrera (2006) found that Upward Bound significantly helps students overcome barriers to higher education by fostering both academic skills and a sense of college readiness. On a study of college graduation rates, Ward & Vargas (2012) found that structured academic support and advising are critical for helping students persist through college. Finally, Allen & Esters (2006) studied post-secondary outcomes and found that Upward Bound improved college readiness and access, though its impact on degree completion was variable.

My study contributes to the body of literature by investigating 6-year college graduation rates and looking at significant factors like high school grade point average, active program participation in Upward Bound, and highlights gender disparities in college success. It affirms the need for students to engage in rigorous courses, find support through programs like Upward Bound, and the need to explore gender disparities.

Recommendations for Future Research

Future studies should investigate the relationship between the amount of financial aid a student receives in college and their college graduation rate. These types of studies could highlight college affordability and create policies that make accessibility a reality for low-income families. Many students work during their time in college to pay tuition and to meet their personal needs. Looking at the number of hours worked and college graduation rates would help to see how work obligations impact graduation. Location and environment (e.g., metropolitan, rural) would be interesting to study to see how access to resources plays a role in student success. Conducting a qualitative study would help hear from students directly regarding their college preparation and success. Hearing real-life stories would create an understanding of students' challenges before and during college. These data would especially be helpful when working with men to determine their unique needs. A qualitative study of Upward Bound students and alumni of the program would also provide insight into the benefits of the program and testimonies as to what services provided the most impact. For example, in a study by Perna and Swail (2003) a participant reflected on the program's impact, saying "Upward Bound provided me with the guidance and support I needed to navigate the college application process and succeed academically." This study found college degree success amongst female students. Understanding the "ingredients" of female college student success is important so that professionals can continue providing them with support. This study could be a pilot study as I examined active and non-active participation in Upward Bound based on attendance. A future study could review the number of hours logged during program participation (a continuous variable) which could yield findings on how the quantity of program exposure impacted college success. Student Wellness is another area of study that could be beneficial for first generation, low-income students. A study

on how colleges integrate wellness into the campus culture and what opportunities exists to teach self-help strategies and coping with the stress skills could yield important findings. Finally, evaluating institutional support for students and the link to college graduation would measure resources designed to promote retention and graduation.

Conclusion

In conclusion, this study contributes to the growing body of literature on educational interventions for first-generation, low-income students by providing empirical evidence of Upward Bound's impact on college graduation rates. While the results highlight the program's effectiveness in supporting academic achievement, they also point to areas where additional support may be needed, particularly for students facing significant socio-economic challenges. Future research should explore the role of continuous, personalized support in higher education to maximize the long-term success of Upward Bound participants. First-generation, low-income students need champions in their lives who will help provide them with knowledge, resources, and direct assistance when it comes to preparing for and entering college. Under the theoretical framework of constructivism, students can construct new knowledge based on their lived experiences as they navigate the education pipeline. Key factors include taking rigorous classes, involvement in programs like Upward Bound, and the need to support both males and females in college. First-generation, low-income men are a vulnerable population that needs assistance during their educational journey. Academic support (e.g., access to tutoring to do well in rigorous courses) is a significant factor for students in this sample.

This work needs to begin early with students practicing good study skills and challenging themselves with competitive courses. Understanding the college landscape and the various pathways to degrees will help families make informed decisions that meet their child's career

aspirations—including financial literacy, as this can be one of the first major financial decisions for a low-income student. College success professionals should create opportunities to engage first-generation, low-income students and promote existing support programs. College success represents a change in life trajectory for students and should be a choice that hinges on desire, not circumstances out of their control.

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Appendices

Appendix A: IRB Approval

October 28, 2020

Raymond Cabrera
[redacted]
Tampa, FL 33620

Dear Mr. Cabrera:

On 10/28/2020, the IRB reviewed and approved the following protocol:

Application Type: Initial Study
IRB ID: STUDY001712
Review Type: Expedited 5
Title: Navigating the Pre-College Landscape to Post-Secondary Success: A look at Academic Preparation, College Type, and Gender Gaps in First-Generation, Low-Income Students
Funding: None
IND, IDE, or HDE: None

Approved Protocol: Protocol, Version 1, 10-21-2020

Within 30 days of the anniversary date of study approval, confirm your research is ongoing by clicking Confirm Ongoing Research in BullsIRB, or if your research is complete, submit a study closure request in BullsIRB by clicking Create Modification/CR. In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Your study qualifies for a waiver of the requirements for the informed consent process for this record review as outlined in the federal regulations at 45 CFR 46.116(f).

Sincerely,

Various Menzel
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Appendix B: Sample Demographics

Gender	Sample size
Male	48
Female	115
Total	163
Race/Ethnicity	
African American	127
White	36
Total	163

Appendix C: Enrolled Students X Graduation Rates

Table C1

Sex

	Total (n = 163)	Male (n = 48)	Female (n = 115)	Chi-Square Test
Did Not Graduate	42.3	62.5	33.9	11.34***
Graduated	57.7	37.5	66.1	

Note. *p < .05. **p < .01. ***p < .001

Table C2

Crosstab

			Female		
			.00 M	1.00 F	Total
Graduation	0	Count	30	39	69
		% within Female	62.5%	33.9%	42.3%
	1	Count	18	76	94
		% within Female	37.5%	66.1%	57.7%
Total		Count	48	115	163
		% within Female	100.0%	100.0%	100.0%

Table C3

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.337[a]	1	< .001		
Continuity Correction[b]	10.196	1	.001		
Likelihood Ratio	11.301	1	< .001		
Fisher's Exact Test				< .001	< .001
Linear-by-Linear Association	11.267	1	< .001		
N of Valid Cases	163				

Note. a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.32.

b. Computed only for a 2x2 table

Appendix D: Descriptive Statistics for Quantitative Variables by Graduation Status

Table D1
Graduation Status

Descriptive Statistics for Quantitative Variables by Graduation Status

Variable	Total (n = 163)	Graduation Status: Did not graduate (n = 69)	Graduation Status: Graduated (n = 94)	Independent samples t-test
High School GPA (Unweighted)				
Mean	2.90	2.64	3.10	t = 7.99***
Median	2.92	2.52	3.11	
Kurtosis	-.924	1.22	-.545	
Skewness	.139	.969	-.326	
SD	.430	.345	.378	
Min.	2.07	2.08	2.07	
Max.	3.90	3.84	3.90	
High school GPA (Weighted)				
Mean	3.69	3.23	4.03	t = 5.99***
Median	3.50	3.12	3.83	
Kurtosis	-.195	-.386	.065	
Skewness	.461	.690	.500	
SD	0.94	0.82	0.87	
Min.	1.96	1.96	2.17	
Max	6.45	5.48	6.45	
Number of Honors Courses				t = 1.57ns
Mean	11.48	9.91	12.63	
Median	10.00	8.00	11.50	
Kurtosis	-.107	-.697	-1.07	
Skewness	.467	.685	.301	
SD	10.97	9.9	11.61	
Min.	0	0	0	
Max	34	34	34	
Number of AP courses				t = 1.65*
Mean	2.78	2.20	3.20	
Median	.000	.000	.000	
Kurtosis	.007	.840	-.445	
Skewness	1.06	1.01	.986	
SD	3.85	3.39	4.12	
Min.	0	0	0	
Max	12	12	12	

Note. *p < .05. **p < .01. ***p < .001.

Appendix E: College Type x Graduation Rates

Table E1

College Type X Graduation Rates

	Total (n = 163)	Did not Graduate (n = 69)	Graduated (n = 94)	Chi-square test
Two Year	51	33	18	15.22***
Four Year	112	36	76	

Note. *p < .05. **p < .01. ***p < .001

Table E2

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	15.221[a]	1	< .001		
Continuity Correction[b]	13.917	1	< .001		
Likelihood Ratio	15.234	1	< .001		
Fisher's Exact Test				< .001	< .001
Linear-by-Linear Association	15.128	1	< .001		
N of Valid Cases	163				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21.59.
b. Computed only for a 2x2 table

Table E3

*Graduation * YR_4*

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.800[a]	1	< .001		
Continuity Correction[b]	12.538	1	< .001		
Likelihood Ratio	13.786	1	< .001		
Fisher's Exact Test				< .001	< .001
Linear-by-Linear Association	13.715	1	< .001		
N of Valid Cases	163				

Note. a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.32.
b. Computed only for a 2x2 table

Table E4

Crosstab

			YR_4		
			.00 2_YR	1.00 4_YR	Total
Graduation	0	Count	31	38	69
		% within YR_4	64.6%	33.0%	42.3%
	1	Count	17	77	94
		% within YR_4	35.4%	67.0%	57.7%
Total		Count	48	115	163
		% within YR_4	100.0%	100.0%	100.0%

Appendix F: Colleges Enrolled into by Upward Bound Students

2 Year	4 Year
Central Piedmont	Bethune-Cookman University
Ellsworth Community College	Clark Atlanta University
Hillsborough Community College	Cuny Borough of Manhattan
Norfolk College	Florida Agricultural & Mechanical University
Piedmont Virginia Community College	Florida Atlantic University
St. Petersburg College	Florida Gulf Coast University
Tallahassee Community College	Florida International University
Tyler Community College	Florida Memorial University
	Florida State University
	Full Sail University
	Howard University
	Northern State University
	Norwich University
	Paine College
	Park University
	Radford
	St. Leo University
	University of Central Florida
	University of Florida
	University of Maryland
	University of Nebraska
	University of South Florida
	University of Tampa
	University of West Florida
	Waldorf College
	Warner University

Appendix G: Graduation Rates x Race

Table G1

Chi-Square Tests

	Value	*df*	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.705[a]	3	.439
Likelihood Ratio	2.739	3	.434
Linear-by-Linear Association	.499	1	.480
N of Valid Cases	163		

Note. a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.69.

Table G2

Crosstab

			Ethn				
			1 AfAm	2 White	3 Latino	4 Asian_Oth	Total
Graduation	0	Count	55	3	9	2	69
		% within Ethn	43.3%	75.0%	33.3%	40.0%	42.3%
	1	Count	72	1	18	3	94
		% within Ethn	56.7%	25.0%	66.7%	60.0%	57.7%
Total		Count	127	4	27	5	163
		% within Ethn	100.0%	100.0%	100.0%	100.0%	100.0%

Appendix H: Active Students x Graduation

Table H1

Active Students X Graduation

	Total (n = 163)	Did not graduate (n = 69)	Graduated (n = 94)	Chi-square test
Active	133	51	82	4.70*
Not Active	30	18	12	

Note. *p < .05. **p < .01. ***p < .001

Table H2

Chi-Square Tests

	Value	*df*	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.702[a]	1	.030		
Continuity Correction[b]	3.857	1	.050		
Likelihood Ratio	4.651	1	.031		
Fisher's Exact Test				.040	.025
Linear-by-Linear Association	4.673	1	.031		
N of Valid Cases	163				

Note. a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.70.

b. Computed only for a 2x2 table

Appendix I: Variable Correlations

GPA and Rigor	UGPA	WGPA	Honors	AP
Unweighted GPA	1	.601**	.074	.159*
Weighted GPA	.601**	1	.584**	.639**
Honors	.074	.584**	1	.638**
AP	.159*	.639**	.638**	1

Note: GPA is measured at high school graduation, Honors is the number of courses taken in high school, Advanced Placement is the number of AP classes taken in high school.
*$p < .05$. **$p < .01$. ***$p < .001$

Appendix J: Logistic Regression Results Predicting Graduation Status

Logistic Regression Results Predicting Graduation Status (n=163) with both unweighted and weighted GPA in the model, R-squared .357

Variable	P-Value	OR	95% CI Lower	95% CI Upper
UGPA	.004	9.18	2.05	41.25
W GPA	.130	2.34	.779	7.00
Honors	.591	.984	.929	1.04
AP	.316	.921	.784	1.08
College type	.154	2.10	.757	5.81
Gender	.032	2.62	1.09	6.32
Active	.008	4.28	1.45	12.59
Race	.751	.838	.280	2.50
Constant	< .001	.001		

Note. Upward Bound students in this sample were 9 times more likely to graduate from college with higher unweighted GPAs, 2 times more likely if female, and 4 times more likely if active in the Upward Bound program while in high school. VIF value for the Regression was well under the common threshold of 5 indicating no multicollinearity among the independent variables (O'Brien, 2007).