

Assessing Factors that Distinguish First-Generation College Students from Non-First Generation
College Students at an Urban Comprehensive University

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ABSTRACT

The purpose of the study was to compare a freshman cohort of first and non first-generation college students and to identify characteristics that distinguish the two groups in terms of selected demographics, pre-college behaviors and beliefs (expectations and personal traits). Moreover, the study sought to identify variables whose distribution indicated a significant difference between the two groups and rank those variables by order of the strength of association.

Data analysis for this study consisted of a combination of chi-square and descriptive discriminate analysis using logistic regression. Chi-square analysis was the preliminary statistical procedure used in this study. Descriptive Discriminate Analysis was used because its primary function is designed to reveal projected differences among groups (Huberty, 1994).

The results revealed seven important characteristics (Reading for pleasure (*Hpw0111*), Household income (*Income*), Asked teacher for advise (*Act0114*), Rate computer skills (*Rate0103*), Get a bachelor's degree (*Futact11*), Change major field of study (*Futact01*) and Obtain recognition by colleague (*Goal0103*) were commonly statistically significant student characteristics across all race/ethnicity groups, and three (Gain a general education (*Reason05*), High school grade point average (*HSGPA*) and Felt overwhelmed (*Act0110*) were unique to one or some of the groups. These variables can also be viewed as predictors that help identify the likelihood that a student is first-generation. Results of this study had implications for the practice of high school guidance counselors, student and academic affairs practitioners and specifically support services personnel and financial aid officers.

Dedication

This work is dedicated to my wife Toinette and three daughters Jasmine, Ashley and Alicia. Each of you has served as my Angels of inspiration. I could not have achieved this milestone without you in my life. We did it.

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Chapter 1

Introduction

At the turn of the 20th century, the majority of college students were white male adolescents, primarily the sons of doctors, lawyers, ministers, prosperous merchants, and well-to-do farmers (London, 2000). With notable exceptions, during this time frame, females and minorities who attended college were enrolled in normal schools where they studied to become teachers.

The modern era (1945 to present), however, brought the influences of government policies and the economy on access to higher education to the foreground. Some demographics from this era illustrate the point. The total population of the United States grew 100% between the years of 1900 and 1948. During this same period, the college population increased almost 1000% (Brubaker & Rudy, 1996).

Between 1900 and 1997 the percentage of 18-year-olds attending college increased from 4% to 65% of the population of 18-year-olds (Levine & Cureton, 1998). Behind these numbers was a consistent policy of government support for Americans' expectations of and desire for higher education. Federal legislation provided more and more citizens an opportunity to pursue a college degree. For instance, veterans were able to access a postsecondary education by taking advantage of the Servicemen's Readjustment Act of 1944 (G.I. Bill). The Truman Commission Report of 1947 established a community college system to offer citizens a more accessible and affordable education. Access for racial minorities was advanced with the United States Supreme Court's decision in *Brown v. Topeka Board of Education* in 1954. By declaring that "separate but equal" education for African-American students was unconstitutional, the ruling provided an impetus to address the concern of equal access to higher education for all citizens. Financial aid

programs to make higher education available to those who could not otherwise afford it were also established during the modern era. These government policies played a key role in increasing access to higher education (Callan, 1993; Millard, 1991; Trow, 1993; Vaughan, 1992).

Economic issues during this time also influenced access to higher education. There was concern about the impact of returning veterans on the economy after World War II. Higher education officials support the purposes of the G.I. Bill to give soldiers an opportunity to earn a college degree so they could bring different skills to the workplace. In the 1980s, the economy was depressed and the corporate sector called on higher education to produce better-trained graduates. College and university officials responded to the demand for better-educated workers by opening their doors. Higher education officials recognized the need to provide an education to a more diverse population. Critics warned that the failure to do so could result in a failed economy with an entrenched underclass (Davies, 1998). Minorities, women, and immigrants constituted an increasingly large percentage of the states' populations. State officials realized they must include these groups in their efforts to improve the educational level of their work force.

As a result of these changes, in the last nine decades, the United States has become increasingly urban and periods of extended migrations have mixed people and cultures as never before (London, 2000). Today, the contemporary college student is, statistically speaking, no longer upper middle class, adolescent, white, or male; instead, the proportion of working-class and minority students pursuing a higher education has increased dramatically. It is now commonplace to see older students in college and women undergraduates outnumber men (London, 2000).

As the student population grew in numbers and diversity, researchers were challenged to define the population so they might study their experiences. As more Black, Hispanic and Asian students entered higher education researchers conducted more research on those students. Previously, the homogeneity of the student population was a standard part of the researchers' approach to their work. With the increasing diversity of the college population, that assumption was no longer appropriate (Pascarella & Terenzini, 1998).

Researchers began to investigate issues they considered possible influences on the experiences of students in higher education. Questions were raised as to the roles that gender, race, socioeconomic status, and generational status might play in a student's college experience. The effect of students' gender on their educational experiences spawned research in many areas (Jacobs, 1996; Morgan, 1996; Smith, 1990; Whitt, Edison, Pascarella, Nora, & Terenzini, 1999).

Researchers also investigated the role of race on students' educational experiences (Cokley, 1999; Jackson, 1998; Nisson, Paul, Lupini, & Tatem, 1999; Torres, 1999). For example, the use of a bicultural orientation program for Hispanic college students was presented in a study by Torres (1999). The role of race was explored in a comparison of two ethnic groups' attitudes towards perfectionism (Nisson et al., 1999). Whitt et al. (1999) conducted a comparison study of two ethnic groups' cognitive skills and pre-college behaviors. Major findings from the study revealed that Asian and Hispanic students lag behind White students in various cognitive skills.

The effect of socio-economic status on students' college experiences has also been a theme of higher education research (Baker & Steiner, 1995; Chaney, Muraskin, Cahalan, 1998; Lavin & Hyllegard, 1996; Levine & Nidiffer, 1996). For example, Chaney et al. (1998) conducted a longitudinal study to explore the effect of a federal program for disadvantaged

students on retention. Another study interviewed students who had overcome lower-income backgrounds to get into college (Levine & Nidiffer, 1996).

As the middle-class population of the United States continues to grow and more students from the diverse segments of society enter private and public colleges, their enrollment must by its very nature impact higher education (London, 2000). For instance, private and public colleges in rural areas, where racial diversity can be limited, may experience a greater challenge with the task of educating a more diverse student population. In many cases, this growing population of students will consist of first-generation college students and students from different racial and ethnic backgrounds (London, 2000).

Many first-generation college students have benefited from what sociologists call *structural mobility*, a concept that in a stratification system refers to the vertical movement of a specific group, class, or occupation. Typically, the grandparents of first-generation college students did not complete high school and held blue-collar jobs; their parents, who also might not have completed high school, hold either blue-collar or lower-level white-collar positions (London, 2000). Although many first-generation college students and their parents agree that a post-secondary education might be a catalyst for a better future, they continue to have reservations about entering what they consider to be relatively uncharted territory.

Many first-generation college students are somewhat skeptical about the opportunities associated with college (Richardson & Skinner, 2000). Often, such students come from communities and backgrounds where they are told horror stories about college, stories that heighten their anxiety regarding the pitfalls associated with being a minority in a higher-education setting (Richardson & Skinner, 2000). For example, many first-generation college students are told that college will not erase the fact that they are minorities, that they will not be

able to find jobs, and that a college education can do nothing for them (Richardson & Skinner, 2000). Despite the anxieties raised by such stories, perhaps the greatest pitfall facing first-generation college students is their lack of preparation.

In 1997, first-generation college students represented more than 26% of all those enrolled in undergraduate programs in the United States (Cokely, 1999). Researchers found that a significant number of these students are ill-prepared for college and lag behind upper middle class White students in persistence and graduation rates. Researchers have suggested that the cause for this outcome involves students' academic preparedness prior to enrolling in college. Sax, Astin, Korn and Mahoney (1998), for example, found that the most academically-prepared high school students graduate from college at higher rates and often in fewer than five years. In the same study, the researchers reported that 19.4% of African Americans graduated from college in four years, compared with 22.9% of American Indians, 26.8% of Hispanics, 30.5% of Mexican Americans, 42.7% of Whites, and 50.2% of Asian Americans. When analyzing college graduation rates, Sax, Astin, Korn and Mahoney (1998) combined SAT scores with high school grades and discovered distinct differences in the rates of degree completion between first-generation college students and non-first-generation college students. Not surprisingly, of the two groups, non-first-generation college students took less time to complete their degrees (Sax, Astin, Korn & Mahoney, 1998).

Simply put, many first-generation college students enter college without adequate academic preparation. This is largely due to the fact that many such students do not take the sort of high school classes that will prepare them appropriately for the rigors of college. As a result, more college and university officials have begun to designate resources and personnel for support systems that will address the needs of these students. One such method has involved the

development and implementation of summer transitional programs designed to assist the student in preparing academically for the demands of an advanced education. In addition, such endeavors often involve requiring first-generation college students to enroll in support programs designed to support their educational performance during their first year. Higher education officials have also realized that in addition to preparation and first-year success, retention must likewise be a major focus of any effort designed to assist such students. Therefore, to increase retention and development, support or intervention programs generally also consist of tutoring, special mentoring, and additional assistance (Richardson & Skinner, 2000). However, before college and university officials could implement effective and efficient structures to support and help students become academically successful, they needed additional data (Edwards, 1993; Levine, 1993).

As a result, university officials began establishing offices to address multicultural issues related to student development and achievement. Although all students, regardless of race and gender, use support programs, many institutions began tutoring programs, study skills workshops, time management seminars, and counseling services designed specifically for historically underrepresented students (Edwards, 1993; Levine 1993).

Interestingly, however, these methods of assistance prompted many first-generation college students to describe their initial exposure to higher education as negative. According to Richardson and Skinner (2000), such students often felt that the faculty might have already established low expectations regarding their academic abilities. In a similar study, through qualitative methods, Richardson and Skinner (2000) were able to gather data that would appear to substantiate students' fears. For example, some faculty members were reported to have indicated outright their beliefs that first-generation college students were not as knowledgeable

or as capable as their non-first generation peers - many who are often White. Such comments cause many first-generation college students to feel that in some classrooms a climate of disrespect exists for them.

Higher education officials entering the 21st century witnessed an unprecedented increase in diversity, as the number of college students throughout the United States reached approximately 15 million. Of the total population, White students represented 75.1% (10,462,099), African American students accounted for 12.3% (1,703,318), and Hispanic students represented 12.5% (1,461,806) (*Chronicle of Higher Education Almanac*, 2003). Women represented 56.1% of the total population. The 21st century will also bring about an increase in enrollment for Asian, African American and Hispanic students. In addition to these changes a shift occurred in the age of college students away from the traditional 18 to 22 years old, as enrollment numbers began to include older or “nontraditional” students. An additional change involved an increase in the number of part-time students who balanced attending college with working full-time jobs (Altbach, 1993; Baxter Magolda & Terenzini, 1999).

With first generation status on the rise in higher education, and an effort to more effectively understand their college experiences, researchers and university officials were challenged to define—or perhaps even redefine—this growing population. Researchers and university officials began to investigate the role of such variables as gender, race, and socio-economic status, and examine how they might influence the experiences of first generation students in higher education (Jacobs, 1996).

The effects of gender on a student’s educational experience prompted additional research in this area (Jacobs, 1996; Morgan, 1996; Smith, 1990; Whitt, Edison, Pascarella, Nora, & Terenzini, 1999). For instance, when Smith (1990) conducted a study comparing the experiences

of women attending co-educational institutions to the experiences of those attending women's colleges, the researcher discovered that students in the latter group had higher grade point averages and higher rates of degree completion. In addition, when Whitt, Edison, Pascarella, Nora, and Terenzini (1999) studied classroom environments that make female students feel uncomfortable they found that those who attended women's colleges felt more comfortable. In both studies the researchers concluded that women did well because they found the environment more supportive at single sex institutions.

However, research addressing generational status has not so much explored the impact of college experiences on first-generation college students as much as it has examined the pre-college experience of such students. Research in this area was introduced in the 1980s and continued throughout the 1990s (Brown, 1997; Fallon, 1997; Fishman, 1997; Justiz & Rendon, 1989; MacDermott, Conn, & Owen, 1987; Olson & Rosenfeld, 1984a; Olson & Rosenfeld, 1984b; York-Anderson & Bowman, 1991). These studies tended to examine either the characteristics or the experiences of first-generation college students prior to enrollment.

The first category of existing research focuses on the characteristics of first-generation college students prior to enrolling in post-secondary education (Brown, 1997; Fallon, 1997; Justiz & Rendon, 1989; Olson & Rosenfeld, 1984a; Olson & Rosenfeld, 1984b; York-Anderson & Bowman, 1991). For instance, researchers have examined the knowledge that students had regarding financial aid programs. Olson and Rosenfeld (1984b) found that the level of knowledge concerning financial assistance greatly influenced the choices of first-generation college students regarding whether to attend college, as well as choice of schools.

Additional research has focused on the level of parents' education (Brown, 1997; Fallon, 1997; MacDermott et al., 1987; Olson & Rosenfeld, 1984b). Several such studies revealed that

many parents who did not attend college viewed the attendance of their children as a threat to their culture and family values (Fallon, 1997; Justiz & Rendon, 1989).

The second category of research deals with the experiences of first-generation college students, particularly the interaction between such students and their high school counselors (Brown, 1997; MacDermott et al., 1987; Fallon, 1997; Justiz & Rendon, 1989; Olson & Rosenfeld, 1984a; York-Anderson & Bowman, 1991). For instance, school personnel frequently do not provide adequate information about college to first-generation college students nor do they provide sufficient assistance with the college application process (Olson & Rosefeld, 1984a). Researchers have determined that such personnel often failed to perform these duties because they feel such students lack the cognitive development and the academic preparation to attend college (Olson & Rosefeld, 1984a).

Despite the inroads made by these two areas of study, a third little-researched area could provide the most insightful information regarding the first-generation college students. This third area of investigation examines such students in the college setting. A majority of the studies that do exist simply compare the persistence rates of first generation college students to those of non-first generation college students (Terenzini et al., 1995; Richardson & Skinner, 2000). Between these two groups, for instance, Terenzini et al. (1995) compared pre-college characteristics and first-year experiences. Researchers have also examined whether students' cognitive development could be connected with generational status. In both cases, the authors argued that, primarily due to their lack of academic preparation prior to college enrollment, many first generation students should be considered "susceptible." Additionally, Terenzini et al., (1995) recommended that more research be completed and that support from higher education officials be provided to first-generation college students.

As previously noted, with respect to underrepresented students, in the past 30 years the issue of access to higher education has given way to studies aimed at improving retention rates and better support services for first-generation students (Richardson & Skinner, 2000). As a result, academic and student affairs officers have come to the conclusion that to create effective retention and support programs, they must possess a clearer understanding of the population they hope to reach (Richardson & Skinner, 2000). As researchers continue to investigate the experiences of first-generation college students, it is also important to study students of color, as Terenzini et al., (1995) have done with their research comparing traditional and underrepresented students by gender, race, and socio-economic status. However, studies that use the same variables to compare students *within* racial groups are more limited. This study sought to address this research gap. Though the focus of this study is on first-generation students of color, I will study students of non-color, too and will make a comparison to see if I can find any differences between students who identify themselves as White and those who identify themselves as a student of color.

Purpose of the Study

The purpose of the study was to compare a freshman cohort of first and non first-generation college students enrolled in an urban university and to identify characteristics that distinguish the two groups in terms of selected demographics, pre-college behaviors and beliefs (expectations and personal traits). Moreover, the study sought not only to identify variables whose distribution indicated a significant difference between the two groups, but also rank those variables by order of the strength of association. Further, though the focus of this study was on first-generation students of color, I studied white, non-Hispanic students to see whether I could

find any differences among the racial/ethnicity groups on characteristics that differentiate the first and non-first generation college students.

In an effort to determine whether differences do exist, I examined selected demographic characteristics (age, distance from campus gender, enrollment status, grade point average, parents' income, and race/ethnicity), selected pre-college behaviors (asked teacher for advice, enrollment in advanced courses, study with other students, study or homework, parents wanted me to attend college, tutoring/remedial needs, use of the internet for research or homework, volunteer work), and selected beliefs regarding students' personal traits and expectations (academic ability, change major field, computer ability, communicate regularly with professors, drop out temporary, graduate with honors, graduate with bachelor degree, leadership ability, make at least a "B", mathematical ability, membership in a social fraternity or sorority, work full-time, writing ability, self-confident).

To ensure that my analysis was grounded in established research, I derived these variables from the Annual Freshmen Survey (AFS) and from a review of literature and research studies, as well as from the recommendations of such authors as Inman & Mayes (1999), and Terenzini, Springer, Yaeger, Pascarella, & Nora (1995). AFS was developed by researchers in the Cooperative Institutional Research Program (CIRP) at the University of California at Los Angeles (UCLA) (Sax, Astin, Korn, & Mahoney, 2000). Data analysis for this study consisted of a combination of chi-square and descriptive Discriminate analysis using logistic regression. Chi-square analysis was the preliminary statistical procedure used in this study. Because the study contained numerous independent variables, I relied on a sequence of chi-square analyses to help identify a list of statistically significant variables to be used in the subsequent descriptive Discriminate logistic regression model. Descriptive Discriminate analysis was used because its

primary function is designed to reveal projected differences among groups (Huberty, 1994). It was also used because finding the students' characteristics that differentiate first and non first-generation college students was the major purpose of this study, and the outcome, generation status, is a dichotomous variable; descriptive Discriminate analysis via logistic regression was considered to be most suitable for addressing the three research questions in my study.

Research Questions

This study was designed to explore the following research questions regarding the distinguishing characteristics of first-generation college students from non-first generation college students:

1. Do selected demographic characteristics (age, distance from campus, gender, enrollment status, grade point average, parents' income, and race/ethnicity) distinguish first-generation students from non-first generation college students with regard to generational status? Are there any interaction effects between race/ethnicity and other demographic characteristics on generation status?
2. Do selected pre-college behaviors (asked teacher for advice, enrollment in advanced courses, study with other students, study or homework, parents wanted me to attend college, tutoring/remedial needs, use of the internet for research or homework, volunteer work) distinguish first-generation college students from non-first-generation college students? Are there any interaction effects between race/ethnicity and selected pre-college behaviors on generation status?
3. Do selected beliefs regarding students' personal traits and expectations (academic ability, change major field, computer ability, communicate regularly with professors, drop out temporary, graduate with honors, graduate with bachelor degree, leadership ability, make at least

a “B”, mathematical ability, membership in a social fraternity or sorority, work full-time, writing ability, self-confident) distinguish first-generation college students from non-first-generation college students? Are there any interaction effects between race/ethnicity and the selected beliefs on generation status?

Significance of the Study

This study has the potential for significant bearing on both future practice and future research. In terms of practice, in addition to first-generation college students of color and their parents, several other constituencies might benefit from the findings of this study, including college administrators, student affairs officials, and high school counselors.

Practically, this study could benefit parents by providing them with a better understanding of how to help prepare their students for college. Students themselves could reap such benefits as a clearer perception of how they are similar to their peers. Moreover, the information might help such students establish an overall sense of community and belonging. Finally, various administrators, student affairs officials, and high school counselors could gain from this study a deeper understanding of the multiple ways that they could assist first-generation college students as they prepare for and enroll in college.

With regards to future research, future scholars could add to the accumulation of the knowledge by replicating the present study at different types of institutions. For example, exploring the experiences of first-generation college students at community colleges and at historically Black colleges and universities can provide a broader understanding of the study group as a whole.

Researchers might also want to explore first-generation college students using a different definition than the one used for this study, as this might lead to additional findings, which in turn

would broaden the existing literature. Further qualitative research can be done on first-generation college students. Such studies could reveal a more in-depth understanding of the many obstacles, feelings, and experiences that these students encounter.

Organization of the Study

This study is organized by five chapters. Chapter One provided an introduction to the study, its purpose, the research questions it poses, and its significance. The second chapter provides a review of relevant literature on the topic. Chapter Three describes the methodology employed in the study and includes the sampling procedures and methods used to collect and analyze the data. Finally, the fourth chapter reveals the results of the study, while Chapter Five discusses the results, the limitations of the study, and their implications for future research and practice.

Chapter 2

Literature Review

Before conducting this study, I examined several topics related to the subject of first-generation college students. First, a theoretical framework constructed for the College Choice Process Model was investigated (Ranero, 1999). The second area of exploration involved selected demographic characteristics (i.e., age, race, gender, economic status, and SAT/ACT scores) of first-generation college students, as well as literature relevant to this topic. A third area explored by this study was selected pre-college behaviors of first-generation college students, which subsequently revealed two sub-topics: interactions with family members and interactions with non-family members. A fourth area involves selected beliefs of first-generation college students' personal traits and expectations. The literature review presented in this chapter is organized around these four major topics and their sub-topics.

The College Choice Process Model

The College Choice Process Model is based on factors that impact the decision of students to attend college. It takes into account background characteristics, student characteristics, the student's family, and characteristics of the college (Ranero, 1999). To better understand this process, each stage of the model is discussed. The three main stages of this model are *college aspiration*, *college search*, and *college choice* (Hossler & Gallagher, 1987; Litten, 1982; Martin & Dixon, 1991; Paulsen, 1990).

The College Aspiration Stage

The first stage of the College Choice Process Model is the aspiration stage, wherein students determine whether or not they wish to attend college (Paulsen, 1990). During this stage, certain background characteristics (socioeconomic status, aptitude, race, gender, peers, and

educational level of parents) can influence a student's decision (Hossler & Gallagher, 1987; Liten, 1982; Martin & Dixon, 1991; Paulsen, 1990).

Socioeconomic status has proven to be a strong indicator of college attendance. For example, researchers Hossler & Gallagher (1987) found that students with high socioeconomic status are more likely to go to college than those with low socioeconomic status. Furthermore, such status can open doors of access to higher education or limit students' ability to even consider attending college. According to Gladieux and King (1999), access to higher education is, in theory, available to all, but the reality is that a student from a family with a higher socioeconomic status (\$75,000 or more annually) has an 86% chance of attending college by age 23, while a student with low socioeconomic status (\$50,000 or less annually) has only a 38% chance of doing so.

Achievement and ability are additional indicators linked to the aspiration stage of the college selection process. As academic achievements and abilities increase, students are more likely to attend college (Hossler & Gallagher, 1987). For example, when students' achievements and ability levels (i.e., SAT/ACT scores and GPA) reach a point that is college competitive (depending on the choice of college), the college selection process becomes more formal (Hossler & Gallagher, 1987). At this point, students begin talking with teachers, guidance counselors, parents, and peers about attending college.

The influence of parents and peers likewise plays a significant role in a student's aspirations to attend college (Hossler & Gallagher, 1987; Paulsen, 1990). A study conducted by Paulsen (1990) found that students who received support and encouragement from parents to attend college do so at a greater rate than those without parental support and encouragement. In

addition, students who have friends interested in attending college are more likely to pursue such an education as well (Hossler & Gallagher, 1987; Paulsen, 1990).

During the aspiration stage, the pre-college experience of students also influences decisions. For example, according to a study by Paulsen (1990), students who have participated in extracurricular activities during high school (i.e., student government, sports, clubs, and debate teams) are more likely to attend college than those who do not participate. This link can be explained by the fact that many of these students seek high personal achievement; hence, they consider going to college an extension of such achievement (Paulsen, 1990). Students' academic experiences also influence the aspiration stage because those who are enrolled during high school in advanced academic placement or college preparation courses have a better understanding of what will be required of them at the college level (Hayden, 2000). This awareness allows students to assess if they are properly prepared for the rigors of college work (Hossler & Gallagher, 1987).

The College Search Stage

The second stage of the Model involves the search for a college. Students enter this stage when they meet the conditions and expectations of the college aspiration stage. During this second stage, students begin to seek information about colleges and universities they are interested in attending (Hossler & Gallagher, 1987; Litten, 1982; Martin & Dixon, 1991; Paulsen, 1990). Students typically begin this stage by creating a list of colleges and universities, which researchers refer to as a *choice set*. With such a choice set in hand, students can then begin to examine certain characteristics (i.e., net cost of attending college, institution size, teaching reputation, location, and type) of the selected schools and obtain information that will help them make their decision about applying to particular institutions (Hossler & Gallagher, 1987; Litten,

1982; Martin & Dixon, 1991; Paulsen, 1990). In addition, researchers have discovered that students choose for their choice sets a wide variety of institutions, likely to differ in net cost, size, teaching reputation, location, and type (Hossler & Gallagher, 1987).

Litten (1982) suggested that minority students approach the college search process differently from White students. Minority students typically start their college search process later than do Whites. In some cases, minority students initiate their search process mere months before they are due to graduate from high school; in a few cases, they even begin the process after graduation. While there is no single reason why minority students often hesitate before entering this stage, Litten (1982) suggested that they might fear being rejected. When compared to their White counterparts, this fear of rejection leads many minority students to consider more types of institutions, such as historically black schools, regional schools, and small state supported schools, however, not surprisingly many minority students exclude community colleges from their list, because they perceive these in a negative way (Litten, 1982). Researchers suggest that students broaden the types of schools in their choice sets because they feel doing so will increase their chances of being accepted.

The second stage ends when students narrow the choice set of colleges or universities in which they are interested and complete applications for those institutions (Paulsen, 1990). At this point the student enters the final stage of the college selection process, that of college choice.

The College Choice Stage

The final stage of the College Choice Process Model is the choice stage. During this stage, students have been notified of their acceptance into particular colleges and universities. They must then make a decision to attend one of those colleges or universities based upon the

assumption that the institutional characteristics mirror their own personal characteristics (Paulsen, 1990).

At this stage, one such important characteristic involves the cost of the college or university. Surrounding the issues of cost are two assumptions: first, that when deciding on a college, students will maximize the perceived cost-benefits of their decision; second, that the student has all of the necessary information about the university to make a rational and sound decision (McDonough & Antonio, 1996).

Using these approaches, students select a college based upon the following criteria (in no specific order): financial aid, guidance counselors, institutional size, location, academic/college reputation, parents, peers, race, and socioeconomic status (McDonough & Antonio, 1996). Along with other personal factors, these items eventually combine with important institutional characteristics to influence the student to attend a particular university (Clark & Crawford, 1992; Paulsen, 1990; Tinto, 1975).

Demographic Characteristics

While a considerable amount of literature exists on disadvantaged students, as well as the relation between parents' education and college choice, persistence, and performance, little is known or has been written about first-generation college students of color. With the shift in the demographic make-up of our society, it was surprising that there is a lack of research examining the demographic characteristics of such students.

Income

One common demographic characteristic noted in several studies involves the income levels of first-generation college students and their non-first generation peers. Not unexpectedly, income levels are lower for the former group (Billson & Terry, 1982; Inman & Mayes, 1999;

Terenzini et al., 1995; Ting, 1995). The lack of sufficient financial resources profoundly impacts first-generation college students, both prior to and during college. Such students are likely to experience more financial pressures during their college experience and such pressures often lead many of them to take on part-time or full-time jobs (McGregor, Mayleben, Buzzanga, Davis, & Becker, 1991). Billson and Terry (1982) reported that first generation college students are more likely than their non-first generation counterparts to work more hours per week at off-campus jobs. For many such students, the requirement to work affects the quality of their education in several ways. According to Billson and Terry (1982), first-generation college students working full or part-time during college are less likely to attend academic support programs and workshops designed to enhance their overall development and assist them in sustaining adequate grades; hence, they place themselves at greater academic risk.

In the same study, researchers found that if first-generation college students are faced with choosing between the dual demands of working full-time and academic responsibilities, they are more likely to prioritize the former, a fact that differentiates them from their non-first-generation peers. These findings are supported in a study by Inman and Mayes (1999) who found first-generation students are likely to have dependents (i.e., children, parents, and siblings) that rely on them for some type of financial assistance; hence, the need to earn money while in college can be more crucial for them. In contrast, when faced with similar demands, non-first generation college students are more likely to quit their jobs (Billson & Terry, 1982; McGregor et al., 1991).

Race and Gender

On the topics of race and gender among first-generation college students, limited research has been conducted. The research that does exist focuses almost exclusively on comparing first-

generation college students of color to their White peers. According to Terenzini et al. (1995), first-generation college students are more likely to be Hispanic than non-first generation college students. The researchers also found that the two groups of students differ in terms of gender. First-generation college students are more likely to be female (Inman & Mayes, 1999; Terenzini et al., 1995).

However, despite the research that does exist on the issues of race and gender, there is no known study that compares first-generation college students of color and non-first-generation students of color. Hence, this study seeks to fill such a gap.

Age

Another difference that has emerged as a topic of research is age. First-generation college students are likely to be older than the traditional ages of 18-22, averaging 27 years of age (Inman & Mayes, 1999; Terenzini et al., 1995). Since many first-generation college students come from families whose income does not allow them to attend college immediately after high school, this finding might not be extraordinary. For the most part, many first-generation college students are forced to work to save money for college, so by the time they can attend, they are beyond the traditional age (Inman & Mayes, 1999; Terenzini et al., 1995).

Family Responsibilities

An additional factor that differentiates first-generation from non-first generation college students is family responsibility. As stated previously, many first-generation students are likely to have dependents (i.e., children, parents, brothers, and sisters) that rely on them for some type of assistance; because of this, many such students attend colleges near their homes so they can continue to work and provide their families financial support (Inman & Mayes, 1999). This type of responsibility limits students' ability to participate in extracurricular activities; thus further

limiting their college experience and overall development. As a result, these students usually take longer to graduate and may drop in and out of college frequently (Inman & Mayes, 1999).

Academic Success

Research has been conducted also that compares the SAT/ACT scores of first-generation college students to their white counterparts. A study conducted by Riehl (1994), for example, examined such scores and found that first-generation college students score significantly lower.

In the same study, Riehl (1994) determined similar findings regarding students' grade point averages: those of non-first-generation students were significantly higher (Riehl, 1994). Additional research by Terenzini et al., (1995) revealed that SAT/ACT scores of first-generation college students have increased but continue to lag behind those of their non-first-generation peers. Such lags further illustrate how ill-prepared many first-generation college students are when they enter college. Furthermore, this lag in scores and grades has placed such students at greater academic risk during college. According to Terenzini et al., (1995), however, SAT/ACT scores and grade point averages are not the only factors that impact one's college success; factors such as peers, family, and study habits also play a role.

Pre-College Behaviors

The largest body of literature on first-generation college students so far focuses on their behavior prior to entering college. In an effort to examine this body of literature, this study divides the category into two sub-topics. First, I examined first-generation college students' interaction with family members. Second, I examined their pre-college experiences with non-family members, such as high school counselors.

Family Member Interaction

The college level of the parent and its impact on first-generation college students has been documented in several studies (MacDermott et al., 1987; Olson & Rosenfeld, 1984a; Riehl, 1994). One such study reveals that such students report a lower degree of encouragement from family and friends concerning their college aspirations (Terenzini et al., 1995). According to Terenzini et al. (1995), the lack of parental and peer encouragement to attend college directly and negatively impacts students. To begin with, it actually hinders many students from attending college. In contrast, students who have encouragement from their families and peers are more likely to pursue an undergraduate degree. First-generation college students who plan to attend college usually encounter from family and peers both support and non-support experiences.

One positive outcome for first-generation students was that parents who support their child's decision to attend college are often very involved in the entire educational process (Olson & Rosenfeld, 1984a). This includes discussions about whether to attend college, as well as which college to attend. Although peers, teachers, and counselors might contribute to this process, parents usually play the most significant role in a student's decision to pursue an undergraduate degree (MacDermott et al., 1987; Olson & Rosenfeld, 1984a).

On the other hand, first-generation students whose parents oppose their attending college might receive a negative response when they announce their desire to pursue their educational goals. Without parental reassurance, many such students could begin to question the purpose of a college education. Researchers have shown this lack of encouragement can impact the students' relationships with their parent(s) (Brown, 1997; Fallon, 1997, Justiz & Rendon, 1989; York & Anderson & Bowman, 1991). Some parents of first-generation students believe college represents a threat to the culture and values of the family. For example, they might feel that

higher education will supplant one's original culture and values with those of White America (Justiz & Rendon, 1989). This disagreement regarding the purpose of higher education has caused many first-generation college students to feel torn between family and school (Fallon, 1997; Justiz & Rendon, 1989; Terenzini, Randon, Upcraft, Millar, Allison, Greeg, & Jalomo, 1994).

Another negative outcome that many first generation college students face is parents who fail to understand the pressures of college and the commitment it requires. Such a lack of understanding might result in continuing differences of opinion that ultimately affect a student's academic performance (Brown, 1997). According to Brown (1997), such differences of opinion can also negatively impact students' overall college experience. For instance, students might feel isolated and hesitate to discuss college issues with parents. The isolation and hesitation some first-generation college students thus feel could severely impact their academic development and college experience (Brown, 1997).

Researchers have suggested that first-generation college students and their parents are not aware of a number of issues that impact a student's decision to attend college (Fallon, 1997; Fishman, 1997; Olson & Rosenfeld, 1984b). Lack of information about relevant issues, such as financial aid and academic requirements, influences how such students and their parents negotiate the college search and selection process (Fishman, 1997).

Limited knowledge about financial assistance has been found to profoundly impact the college choices of first-generation students (Olson & Rosenfeld, 1984b). For example, such students and their parents often have limited awareness of banking and loan procedures, and those who are aware of such services fear high loan repayments. This fear is often fostered by the notion that even if students obtain a college degree, it will still be difficult for them to find a job.

Therefore, some students appear uncertain as to whether they want to put such a financial burden on their families (Fallon, 1997).

While many students and parents have limited knowledge regarding financial assistance, even more first-generation students enter post-secondary education less prepared for its academic challenges. Fishman (1997) found that many such students enter college ill-prepared in the fundamental areas of reading, math, and computer skills. Not surprisingly, reading, math, and computer use by students in many rural and urban areas lag behind those of students in more affluent areas. In addition, rural and urban areas reflect a higher concentration of parents with no college experience. According to Terenzini et al., (1995), there is a direct correlation between first-generation college students' computer skills and their parents' level of education. Students whose parents do not have college experience are less likely to possess the computer skills necessary for success in college (Fishman, 1997).

In most cases, parents with no college experience possess limited skills for providing their children with a system of support during college. Plus, parents with no college experience are more likely to find it difficult to help their students map out a successful college career. Therefore, in most cases, first-generation college students must navigate the college experience alone, with limited knowledge of what is required of them (Fallon, 1997; Riehl, 1994; York-Anderson & Bowman, 1991). According to Brown (1997), navigating through the college process with limited support has proven to be a hurdle that many first-generation students fail to overcome. As a result, some students suffer academically or drop out of college altogether.

Researchers have found that when undertaking the college search, first-generation students and their parents often approach the process differently than do their non-first-generation peers. Brown (1997), for instance, found that a major difference occurs in the

traditional practice of visiting colleges and universities. Typically, campus visits by first-generation college students are conducted at schools close to home. In addition, such students rarely participate in overnight campus visitations (MacDermott et al., 1987).

First-generation college students are more likely than their non-first generation peers to visit campuses by themselves or with friends rather than with their parents. Often, the parents are employed in occupations that do not allow them to take time off for such trips. Additionally, many such parents are not in a financial position to take time away from their jobs that would result in a loss of pay (MacDermott et al., 1987). However, the conducting of a college search without parents, revealed no significant impact, positive or negative, on any group of students. Researchers have concluded many first-generation students encounter non-family members (i.e., friends, teachers, coaches, etc) who play a role in their attending and graduating from college (MacDermott et al., 1987).

Non-Family Members Interactions

With respect to pre-college interactions with non-family members, considerable contrast exists between the first-generation and non-first-generation groups. In a study by Terenzini et al. (1995), first-generation students indicated that during the pre-college years they spend less time in social activities with friends than do their non-first-generation counterparts. Another area of considerable contrast between first and non-first generation college students involved knowledge of financial aid programs.

A lack of familiarity with financial aid programs causes many parents of first-generation college students difficulty in the completion of financial aid forms. As a result, some students turn for assistance to outside sources, such as high school guidance counselors. However, high school counselors often fail to provide all of the necessary information and assistance to such

students. Researchers have found this often occurs because many counselors feel first generation students are not “college material” (Terenzini et al., 1995). Failure to properly inform students in a timely manner becomes more crucial when handling time sensitive financial aid materials that require meeting specific deadlines. Students who apply for financial aid late usually run the risk of receiving less aid—or none at all. This failure means that more often, first-generation college students are required to shoulder a larger burden of their financial obligation.

Additional studies on first-generation college students have also revealed that teachers and guidance counselors do a relatively poor job of assisting many first-generation college students in preparing for college (Terenzini et al., 1995). The deficits in such students’ academic skills are often traced to weak high school programs and lack of encouragement from counselors, teachers, and parents (Fallon, 1997).

While there have been studies to explore the behaviors of first-generation students prior to enrollment, additional research has been conducted on the beliefs adopted by such students after attending college. This research has produced additional insight into the ways first-generation college students perceive their personal aspirations and expectations with regarding higher education.

Beliefs

Researchers have explored first-generation students’ beliefs about themselves and higher education both prior to and during their college experience. For example, Billson and Terry (1982) concluded that first-generation college students often decide to pursue a college degree for much the same reasons as do their non-first-generation counterparts. First-generation college students believe that they will increase their knowledge and be prepared for a career by earning a college degree (Billson & Terry, 1982). Billson and Terry (1982) also found that for such

students, social and economic status is the primary motivator for pursuit of a post-secondary degree. However, many first-generation college students lose the respect of some family members and friends if they attempt to earn a college degree. As stated before, this is often the case when family members and friends feel that education will undermine their culture (London, 2000).

Differing opinions between students and parents regarding the value of a post-secondary education have created a gap that is often wider for first-generation college students and their parents than for their non-first-generation peers (Billson & Terry, 1982). The gap first begins to widen in high school because many parents of first-generation college students are not involved in their child's education. By the time such students enter college, parents have not taken the appropriate steps to familiarize themselves with the academic and social demands of higher education, and thus the gap widens. Parents who have limited knowledge of the academic and social demands of higher education usually have difficulty addressing the concerns and needs of their children. Eventually, the gap becomes permanent. In addition, this gap increases the likelihood that students will begin to struggle with their desire to complete college and often succumb to their parents' wishes. In most cases, the struggle becomes too intense, and many students drop out of college rather than continue to dispute their parents' opposition (Inman & Mayes, 1999). First-generation college students also face additional pressure from friends who agree with parents and family members that higher education is disruptive to their culture (London, 2000).

Transition to College

Researchers have focused additional research on the perceptions of first and non-first generation students concerning the transition from high school to college. Not surprisingly,

Inman and Mayes (1999) found that non-first-generation students reported a smoother transition into college. For example, the transition is most often facilitated by one parent (or both) whose knowledge of higher education can play a role in helping their child navigate through the process. In addition, this knowledge provides an opportunity for parents to respond to their students' concerns and needs regarding issues related to higher education (Inman & Mayes, 1999; Pratt & Skaggs, 1989).

Preparation for College

In those studies, first and non-first-generation college students were asked to assess their level of preparation for college. Members of the former group reported less certainty regarding their preparation for postsecondary education (Inman & Mayes, 1999; Pratt & Skaggs, 1989). First-generation college students reported taking easier courses and fewer college preparation courses during high school; as a result, they felt ill-prepared for and faced higher levels of uncertainty about the rigors of college. Additionally, they participated in little to no extracurricular activities, such as student government, debate club, and sports (Terenzini et al., 1994). According to Terenzini et al. (1994), this lack of preparation and limited participation in extracurricular activities place first-generation college students at greater academic risk.

Financial Issues

First-generation college students also had additional concerns regarding financial issues. A study by Inman and Mayes (1999) found that efforts by first-generation college students to manage financial issues often involve attending a school in close proximity to their home. The option to stay at home while attending college is more highly valued by first-generation college students because fulfilling financial obligations is often crucial to their pursuit of a degree. These findings suggest that first-generation college students place significant value on being able to

live at home while attending college because it reduces the costs of a college education and fulfills their family obligations (Inman & Mayes, 1999). Colleges and universities that offer evening and weekend classes are also attractive to first-generation college students, often because financial exigencies force them to work during the day (Inman & Mayes, 1999).

Degree Attainment

According to Inman and Mayes (1999) another area of differentiation between first and non-first-generation college students involves degree attainment. Non-first-generation college students aspire to earn a degree higher than that of the Bachelor of Science or Arts (Pratt & Skaggs, 1989; Riehl, 1994; Terenzini et al., 1995). In contrast, first-generation college students lower their expectations of academic achievement, a fact that might be linked to their lower levels of academic preparation and parental support (Pratt & Skaggs, 1989; Riehl, 1994; Terenzini et al., 1995).

Although each group reports different expectations as to the level of academic success they can reach in higher education, there is no significant difference as to how they view the importance of higher education. Both groups report dedication to earning a college degree (Pratt & Skaggs, 1989).

In addition to degree attainment, the two groups of students were compared as to their expectations of first-semester freshman grades. Again, first-generation college students reported lower grade expectations than their non-first-generation peers (Riehl, 1994). This finding coincided with those first-generation students who reported a lower self-rating of academic preparedness (Riehl, 1994).

Degree completion is another area of differentiation. First-generation college students reported the belief that it would take them more time to complete their degree program than their

non first-generation peers (Terenzini et al., 1995). Researchers of the same study concluded that this difference is perpetuated by the fact that many first-generation college students must split their time, and energy between school and work (Terenzini et al., 1995).

Researchers have also found differences in the perception of first-generation college students toward faculty and teaching. Such students reported a lower degree of belief that faculty care about students and teaching (Terenzini et al., 1995). Interestingly, though, first-generation students also expressed the conviction that interacting with faculty is important (Pratt & Skaggs, 1989).

Confidence levels regarding the choice of a major also differ between the two groups, as Terenzini et al. (1995) discovered. First-generation college students report a higher degree of certainty about their academic majors than do their non-first-generation peers, and the former are less likely to change their majors (Terenzini et al., 1995). According to Terenzini et al., (1995) this level of certainty by first-generation students is supported by reports that suggest because they face multiple obligations, they enter college more focused toward a particular goal (such as a major).

Terenzini et al., (1995) also reported that first and non-first-generation college students differ regarding their perceptions of campus climate. The former group is more likely to report experiencing racial and ethnic discrimination (Terenzini et al., 1995). On a related note, researchers have found that the climate of a college campus can impact students' confidence, academic achievement and self-image. The two target groups differ again in their emphasis on the value of increasing self-confidence. First-generation college students consider increasing self-confidence a more important goal than do their non-first-generation peers (Inman & Mayes, 1999). Researchers have suggested that first-generation college students could see the college

experience as one possessing benefits that extend beyond the academic realm. Also, researchers have found that self-confidence is important to the students' development. Additionally, researchers exploring the issue of self-esteem among the two student groups have found that first-generation students score lower in terms of self-esteem. This fact was mostly due to their lower degrees of academic preparation and parental support (McGregor et al., 1991).

Social acceptance is also a crucial focus of research. Non-first-generation college students are more likely to perceive themselves as socially accepted than first-generation college students (McGregor et al., 1991). Again, a basic unfamiliarity with higher education could cause the latter group to question whether they truly "fit in" (McGregor et al., 1991).

In a study that compared the two groups of students at a community college, researchers found that they differed in regard to alternative post-secondary education plans. When asked what they would do if the community college was not available, non-first-generation college students were more likely to consider attending a state university, while their first-generation peers were more likely not to pursue any alternative education. Those who reported they would attend an alternative school chose vocational or technical institutions (Pratt & Skaggs, 1989).

In the same study, students also responded to an inquiry about the possibility of transferring to another college. Non-first-generation college students reported a greater likelihood of transferring to another college than their first-generation counterparts (Pratt & Skaggs, 1989). The researchers in this study also found college choice could be limited for the latter group by factors such as cost and family responsibilities (Pratt & Skaggs, 1989).

The two groups of college students reported no significant differences in their beliefs regarding post-higher education success. For instance, researchers found consistency between the two groups in terms of how they gauge their ability to land a job and be successful in the

workplace. First-generation college students also express a belief that they are just as capable of success as their non-first-generation peers (McGregor et al., 1991).

Researchers have also examined how the two groups assess their scholastic abilities. Again, researchers found no significant differences between the two groups' self-rating in terms of academic ability or mathematics ability; both groups report competency in these areas (McGregor et al., 1991; Pratt & Skaggs, 1989).

Finally, students from both groups were asked to rate the importance of participating in extracurricular activities, ranging from attending campus concerts to athletic events. Researchers reported no significant difference in how the students in the two groups rate such experiences. Members of both groups consider participation in such events important, although first-generation college students are not as likely to attend as a result of work or pre-existing personal obligations (Terenzini et al., 1995).

Conclusion

A review of existing literature indicates that while some research has focused on the pre-college behaviors and aspirations of first-generation college students, several others explore particular characteristics, such as age, gender, socio-economics, and grades. The overall purpose of this study was to build upon the existing body of knowledge regarding first-generation college students in higher education—more specifically, students of color. This study sought to fill the gap in the current literature with respect to race and ethnicity.

Chapter 3

Methods

This chapter describes the methods used to conduct this study. A description of the population, the sample selection, instrumentation, reliability and validity of the instrument, data collection procedures, and a discussion of the data analysis procedures, follows.

Purpose of the Study

The purpose of the study was to compare a freshman cohort of first and non first-generation college students enrolled in an urban university and to identify characteristics that distinguish the two groups in terms of selected demographics, pre-college behaviors and beliefs (expectations and personal traits). Moreover, the study sought to identify variables whose distribution indicated a significant difference between the two groups and rank those variables by order of the strength of association. Further, though the focus of this study was on first generation students of color, I studied students of non-color too, to examine any differences between the racial/ethnic groups on characteristics that differentiate the first and non-first generation college students.

In an effort to determine whether differences exist, I examined selected demographic characteristics (age, distance from campus gender, enrollment status, grade point average, parents' income, and race/ethnicity), selected pre-college behaviors (asked teacher for advice, enrollment in advanced courses, study with other students, study or homework, parents wanted me to attend college, tutoring/remedial needs, use of the internet for research or homework, volunteer work), and selected beliefs regarding students' personal traits and expectations (academic ability, change major field, computer ability, communicate regularly with professors, drop out temporary, graduate with honors, graduate with bachelor degree, leadership ability,

make at least a “B”, mathematical ability, membership in a social fraternity or sorority, work full-time, writing ability, self-confident).

Data analysis for this study consisted of a combination of chi-square and descriptive Discriminate analysis using logistic regression. The Statistical Package for the Social Sciences (SPSS), was used to conduct both chi-square and Discriminate analyses. Chi-square analysis was the preliminary statistical procedure used in this study. Because the study contained numerous independent variables, I relied on a sequence of chi-square analyses to help identify a list of statistically significant variables to be used in the subsequent descriptive Discriminate logistic regression model. Descriptive Discriminate analysis was used because its primary function is designed to reveal projected differences among groups (Huberty, 1994). It was also used because finding the students’ characteristics that differentiate first and non first-generation college students was the major purpose of this study, and the outcome, generation status, is a dichotomous variable; descriptive Discriminate analysis via logistic regression was considered to be most suitable for addressing the three research questions in my study.

Research Questions

This study was designed to explore the following research questions regarding the distinguishing characteristics of first-generation college students from non-first generation college students:

1. Do selected demographic characteristics (age, distance from campus, gender, enrollment status, grade point average, parents’ income, and race/ethnicity) distinguish first-generation students from non-first generation college students with regard to generational status? Are there any interaction effects between race/ethnicity and other demographic characteristics on generation status?

2. Do selected pre-college behaviors (asked teacher for advice, enrollment in advanced courses, study with other students, study or homework, parents wanted me to attend college, tutoring/remedial needs, use of the internet for research or homework, volunteer work) distinguish first-generation college students from non-first-generation college students? Are there any interaction effects between race/ethnicity and selected pre-college behaviors on generation status?

3. Do selected beliefs regarding students' personal traits and expectations (academic ability, change major field, computer ability, communicate regularly with professors, drop out temporary, graduate with honors, graduate with bachelor degree, leadership ability, make at least a "B", mathematical ability, membership in a social fraternity or sorority, work full-time, writing ability, self-confident) distinguish first-generation college students from non-first-generation college students? Are there any interaction effects between race/ethnicity and the selected beliefs on generation status?

Institution Selection

More than 700 colleges and universities throughout the United States use the Annual Freshman Survey (AFS) to gather crucial information about demographic characteristics, pre-college behaviors, and beliefs regarding higher education of entering freshmen. I identified administrators at five universities with whom I had a rapport and extended them an invitation to participate in my study. Of these universities, three accepted my invitation. After researching each university's demographic make-up, I selected the university that presented the most diverse student population. The institution that was chosen is a medium-size degree-granting urban comprehensive university that offers 23 undergraduate and 15 graduate and professional degree programs. More than 54% of the student population is made up of students of color.

Using the *2002 Higher Education Directory*, information was obtained about the Director of Institutional Research, including name and telephone number. The Director and I arranged a meeting to discuss how the data would be used and how to remove all identifying indicators. After this meeting, the Director of Institutional Research assisted me in gaining access to the university's data. The university selected for this study has administered the AFS, during its summer orientation program, annually since 1998. During my meeting with the Director of Institutional Research, five data sets were reviewed. After reviewing these data, I chose to concentrate on the 2004 data set, because its sample size was the largest. The total fall 2004 freshmen class enrollment was 956. Of this total, 409 students who attended summer orientation had volunteered to complete the AFS survey. The sample represented 43% of the 2004 entering freshmen class.

Instrumentation

The AFS, is a survey instrument created by researchers at the Cooperative Institutional Research Program (CIRP), located at the University of California at Los Angeles (UCLA). A copy of the AFS can be found in Appendix A. The AFS questionnaire, which was first administered to colleges and universities in 1966, is the most widely-used instrument in the United States for gathering data on entering freshmen (Cooperative Institutional Research Program, 1999).

Data on college students were used to develop the items on the AFS based on theoretical assumptions about today's entering freshmen. Each area of the AFS was analyzed by a committee of experts in various fields of higher education, student development, and educational programs, then subjected to statistical tests on an item-by-item basis (Cooperative Institutional Research Program, 1999).

Reliability and Validity

In the course of the past 33 years, data from over 8,000,000 students have been collected (Cooperative Institutional Research Program, 1999). Generally, reliability and validity are assessed for each item on the survey or for a group of questions, rather than for the questionnaire as a whole (Howell, 2002).

In many uses of AFS data, the question of reliability pertains to an aggregated statistic, such as the percentage of freshman agreeing with a particular value statement. Traditional standards of reliability cannot be applied to such aggregated data, since the quality being measured is not in where a particular student stands, but where a group of individuals stands. In these cases, an item that might have “low” reliability when viewed from the perspective of assessing an individual; on the other hand, it could have extremely “high” reliability when viewed from the perspective of an institution (Sax, Astin, Korn, & Mahoney, 2000). Generally, the reliability of these aggregates, each individual item, range from around .70 to .99, with the majority falling in the range of .85 -.95 (Sax, Astin, Korn, & Mahoney, 2000).

Regarding validity of the CIRP, the developers focused on content validity. Content validity was established through use of an expert panel who reviewed each item on the survey, comparing them to domains of interest that had been established from the literature. A threshold of .90 was used for item inclusion. This meant that 90% of the panel needed to agree that this was a good item. The panelists were familiar with the constructs of the survey measure. Experts were researchers and educators within the field of higher education (CIRP, 1995). With this information in hand, I concluded that the reliability and validity were sufficient for purposes of this study.

The AFS consists of two parts. The first part is a standardized questionnaire that all participating institutions administer to entering freshmen, while the second part is a supplemental section that individual institutions can use to ask additional questions of particular interest. The additional questions asked by the participating university were not included in this study. This study focused instead on a selected group of questions that addressed specific research questions.

Respondents were asked to report their gender, age on December 31st of the participating year, enrollment status, the distance they lived from the university, grade point average, SAT/ACT scores, ethnic background, need for special tutoring, parents' income, mother's or father's level of education, coursework they took during high school, high school activities, the number of advanced placement courses and exams taken during high school, personal traits, and personal achievements.

Dependent Variable

The major dependent variable in this study is generation status (i.e., whether the student is first generation college student or not), which is a dichotomous variable. The values of this variable were determined by their parent's level of education. Those who responded that neither their mother nor father had any college experience were assigned to the first-generation college students group; those who reported either their mother or father had at least some college experience or more were assigned to the non-first-generation college student group.

Measures for Independent Variables of Interest

For this study, I chose selected demographic characteristics, selected pre-college behaviors, and selected beliefs regarding students' personal traits and expectations as the independent variables. The following discussion describes the rationale for selecting the following independent variables included in the study.

Demographic Characteristics

The first section of the survey gathered data regarding general demographic characteristics of the respondents. This eight-item section gathered data on the respondent's race, gender, and age. This section also asked respondents about the distance they lived from campus, grade point average, SAT/ACT scores, and parents' income.

Race. Race, is a nominal categorical variable. Respondents were asked to mark the category according to their corresponding race. Upon data entry, participants were coded as either having not marked that category (1) or have marked that category (2) for each racial indicator. Previous studies on first generation college students are limited to the overall analyses without taking race/ethnicity into consideration. In fact, to date there are no known studies which compare, or distinguishes first-generation college students of color from non-first generation college students of color.

Gender. Gender, is a nominal categorical variable. Gender was coded as (0=male; 1=female). Gender has been found to be an important first generation college student factor, with women more likely to be first generation students (Terenzini et al., 1995).

Age. Age, an ordinal categorical variable in this data set, was coded according to the AFS survey based on each respondent's birth date. Age was selected as an independent variable because researchers have found that it plays a significant role in distinguishing first generation status (Terenzini et al., 1995).

Enrollment Status. Enrollment Status, is a nominal categorical variable and was coded as follows: 0= full-time and 1 = part-time. Upon data entry, respondents were asked to mark their enrollment status. Enrollment status was included in a list of independent variables because it has

been found to be an important first-generation classification factor, with first-generation students more likely being part-time – due to their obligation to work full-time (Inman & Mayes, 1999).

Location. Location was considered an ordinal categorical variable and represented the distance (in miles) a student must travel to return home. Location was included in a list of independent variables because, according to Inman & Mayes (1999), first-generation college students tend to attend colleges and universities near their homes, because of the economic benefit.

Grade Point Average. Grade Point Average (GPA) in high school was considered an ordinal categorical variable. Upon data entry, respondents were asked to mark the appropriate letter grade that best describe their academic standing. Respondents could report A+, A, B, C or D. Grade Point Average was included in a list of independent variables because, according to Inman & Mayes (1999), a student's GPA is a strong indicator of first generational status. Grade Point Averages for first-generation students lag those of traditional students.

Standardized Test Scores (SAT/ACT). Standardized Test Scores were considered as a continuous variable. SAT/ACT was coded according to the AFS survey based on each respondent's individual self-reported score. Standardized scores were selected as an independent variable because according to (Riehl, 1994) test scores for first-generation students lag those of traditional students.

Parent's Income. Parents' income was considered an ordinal categorical variable, because of the coding scheme in the data set. Upon data entry, participants were asked to mark the appropriate category of the income range of their parents. Valid response categories included: 1 = less than \$6,000, 2 = 6,000 –9,999, 3 = 10,000 –14,999, 4 = 15,000 – 19,999, 5 = 20,000 – 24, 999, 6 = 25,000 –29,999, 7 = 30,000 – 39,999, 8 = 40,000 –49,999, 9 = 50,000 – 59,999, 10

= 60,000 – 74,999, 11 = 75,000 – 99,999, 12 = 100,000 – 149,000, 13 = 150,000 – 199,999, and 14 = 200,000 or more. Parent's income was included as an independent variable because, according to Terenzini et al., (1995) and Ting (1998), parent's income was a strong indicator in distinguishing generational status.

Pre-College Behaviors. The next section was designed to gather data regarding respondents' pre-college behaviors, either curricular or co-curricular. Respondents were asked to report if they used any educational support services during high school. Also, respondents were asked about their activities and experiences during high school, as well as the number of hours during a typical week they spent engaged in various activities.

Support Services. Support Services (i.e., remediation, learning laboratories, tutorial services, etc), have been found to be an important link in identifying first-generation college students. However, first-generation students are less likely to use such service (Terenzini et al., 1995). Respondents were asked to mark the category according to their academic need. Upon data entry, participants were coded as either having not marked (1) or have marked the category (2) for each indicator during high school. There were seven separate categorical indicator variables on whether students received some support services on each of the following subjects (English, Reading, Mathematics, Social Studies, Science, Foreign Language and Writing).

Advance Placement Courses. Respondents of the AFS were asked to report any advance placement courses taken during high school. Upon data entry, participants were asked to mark the appropriate number of advance courses taken during high school. Advance Placement Courses were included as an independent variable because researchers have reported that there was an association with level of classes taken and generational status (Terenzini et al., 1995).

Pre-college Activities. Respondents of the AFS were also asked to report on various pre-college characteristic activities they participated in during high school. Upon data entry, respondents were asked to mark the number of hours they spent asking a teacher for advice after class, studying/homework, used the internet for research or homework and volunteer work. Response options were as follows: 1 = None, 2 = less than one hour, 3 = 1-2, 4 = 3-5, 5 = 6-10, 6 = 11-15, 7 = 16-20, 8 = More than 20 hours. Pre-college activities were considered ordinal categorical variables, because of the coding scheme in the data set. Pre-college activities were also analyzed because researchers have found that the aforementioned areas were ones in which many first-generation students avoid (Inman & Mayes, 1999).

Beliefs. The AFS also contains items about respondents' beliefs regarding their expectations and traits while in college. The questions deal with academic and personal characteristics. Respondents were asked to report the likelihood of doing certain things while in college, such as changing their major or joining a social Greek Organization (fraternity/sorority). They were also asked to report the highest academic degree they expected to earn. Also, respondents were asked to report the degree of importance they placed on accomplishing various tasks. These tasks ranged from graduating with honors to conducting community service. These were considered an ordinal variable. Response options were as follows: Not Important, Somewhat Important, Very Important, and Essential.

Personal Expectations. Respondents of the AFS were asked to rate themselves in a number of areas: *as compared with the average person of their age*. Based on the recommendations of literature, this study focused on the following: academic ability, computer skills, leadership ability, mathematical ability and writing ability. Response options were: Highest 10%, Above Average, Average, Below Average, and Lowest 10%. Personal

expectations were included as an independent variable because of the general consensus among researchers (Terenzini et al., 1995; Fishman, 1997), that first-generation student who do enter college, do so ill-prepared and with lower levels of self-expectations in areas of reading, math and computer skills.

Personal Aspirations. Respondents of the AFS were also asked to rate themselves in the area of personal aspirations. Personal aspiration was considered an ordinal level variable. Respondents were asked to answer the following question: *What is your best guess as to the chance that you will?* Based on the recommendations of literature, this study focused on the following: work full-time while attending college, join a social fraternity or sorority, make at least a “B” average, drop out of college temporarily, communicate regularly with your professors, self-confidence (social and intellectual), change major field, get a bachelor degree, and graduate with honors. Responses were: Very Good Chance, Some Chance, Very Little Chance and No Chance. Personal aspirations were included as an independent variable because researchers reported that first-generation students often times lower their personal aspiration of academic achievement during college (Inman & Mayes, 1999).

Data Collection Procedures

Prior to initiating this study, I received approval from the Institutional Review Board for Research Using Human Subjects (IRB) at the university participating in the study. After receiving IRB approval, the AFS data were delivered to the Director of Institutional Studies so the study could commence.

The AFS was administered at the campus test site between June 28 and August 28, 2004. The data were collected during summer orientation prior to students entering college. Participants were informed of the purpose and nature of the survey and volunteered to

participate. Those who volunteered were taken to an isolated on-campus test site to complete the survey. Forty-three percent of all incoming freshmen completed the survey instrument. The institution then submitted all completed AFS to the CIRP processing contractor for analysis. After CIRP analyzed the data, the surveys were returned to the university and forwarded to me by the Director of Institutional Research.

Data Analysis Procedures

Data analysis for this study consisted of a combination of chi-square and descriptive Discriminate analysis using logistic regression. The Statistical Package for the Social Sciences (SPSS), was used to conduct both chi-square and Discriminate analyses. Chi-square analysis was the preliminary statistical procedure used in this study. Because the study contained numerous independent variables, I relied on a sequence of chi-square analyses to help identify a list of statistically significant variables to be used in the subsequent descriptive Discriminate logistic regression model. Descriptive Discriminate analysis was used because finding the students' characteristics that differentiate first and non first-generation college students was the major purpose of this study, and the outcome, generation status, is a dichotomous variable. Descriptive Discriminate analysis via logistic regression was considered to be most suitable for addressing the three research question in my study (Huberty, 1994).

In preparation for data analysis, the sample population was grouped into two categories: first and non-first generation status. Steps involved in creating these categories are as follows: respondents were asked to report their mother or father's highest level of education - *grammar school or less, some high school, high school graduate, postsecondary school other than college, some college, college degree, some graduate school, or graduate degree*. Those who reported that one parent had at least some college experience were assigned to the non-first-generation

group. Those who responded that their parent(s) had no college experience were assigned to the first-generation group; hence my dependent variable was established. Since the generation status variable mirrors parent's education levels, level of education was not included as an independent variable in the analyses of this study. Next, because some data were categorical (i.e., Gender - male or female), it was necessary to recode and create dummy variables.

To address the three research questions posed in the study chi-square analyses were conducted to identify the variable that showed significant differences between first and non-first generation status. Chi-square analysis allowed me to determine whether there were significant differences in proportions between first-generation and non first-generation students on the selected demographic, pre-college and belief variables. In addition, I obtained the Cramer's phi coefficient for each variable. The Cramer's phi coefficient represents the effect size measures of strength of association between two categorical variables and thus can be used as an index of substantive importance of the relationship, as opposed to the chi-square statistic used for determining the statistical significance. According to Cohen's (1988, p. 227) suggestion for interpreting Cramer's phi coefficient, a measure of strength of association is interpreted as follows: $.10 < \phi < .30$ = small effect size, $.30 < \phi < .50$ = medium effect size and $\phi > .50$ = large effect size. By rank ordering the Cramer's phi coefficients by the descending order, I was able to determine the relative substantive importance of the variable compared to other statistically significant variables.

After conducting chi-square analysis on the overall sample, I repeated the process by splitting the students by race (White vs. non-White). Further, I repeated the chi-square analysis by further splitting the students of color by ethnicity (Asian, African American and Hispanic) and comparing these groups to White students, because as will be discussed in the results of the

overall analysis, the race/ethnicity variable was both statistically and substantially significant variables in the chi-square analysis for the overall sample.

Following a series of chi-square analyses, descriptive Discriminate analysis via a logistic regression was conducted as the primary analysis for the study. The primary function of descriptive Discriminate analysis is to focus on revealing major differences among groups (Huberty, 1994). Because finding the students' characteristics that differentiate first and non first-generation college students was the major purpose of this study, and the outcome, generation status, is a dichotomous variable, descriptive Discriminate analysis via logistic regression was considered to be most appropriate for addressing the three research question in my study.

Summary

The present study was designed to investigate selected demographic, pre-college and belief factors that distinguished first generation college students from non-first generation college students. The methodology described in the above chapter was deemed appropriate to address the research questions posed in the study.

Chapter 4

Findings

The purpose of this chapter is to report the results from the data analysis. The chapter concludes with a summary that leads to a discussion of the findings provided in Chapter Five, the final chapter.

Characteristics of the Sample

A total of 194 students of 409 that had available information for my study were analyzed. The remaining student data were removed due to incomplete information. Of those, 123 (63.4%) students were classified as First Generation College Student (FGCS) and the other 71 (36.6%) students were classified as Non First-Generation College Student (NFGCS) according to the criteria based on the educational level of the student's parent(s) that was stated in the previous chapter. Items that were relevant to three major research questions posed in this study, i.e. selected demographics, pre-college behaviors and beliefs (expectations and personal traits) were considered in the analyses in terms of differences between FGCS and NFGCS.

As noted in Chapter One, the United States has become increasingly diverse during the last century. According to the National Center for Education Statistics (NCES) (2001), among students in all U.S. postsecondary institutions, women comprised 56% of undergraduates in 1999-2000. In the present study, women comprised 68% of the participants. According to the NCES, minority students represented about one-third of the total undergraduate population; 12% Black, 11% Hispanic, and 5% Asian. In the present study, slightly more than 50% of the participants identified themselves as Hispanic and 75.3% of participants are a racial or ethnic minority group. It is important to note that the sample used for this study is disproportionately Hispanic; thus racial and ethnic make-up of this study is unique and is not representative of the

general college population. It is also interesting to note that the sample's socioeconomic status mirrored those reported by the Social Science Data Analysis Network. In the United States the median income of 93,196,000 White households in 2003 was \$45,572. The median income of 13,696,000 Black households was \$29,689, and that of 11,693,000 Hispanic households was \$32,997 (Social Science Data Analysis Network (SSDN), 2004). White students reported a median income between \$40,000 and \$49,999. The median income for Asians and Blacks ranged between \$25,000 and \$29,999, and that of Hispanics about \$30,000.

Descriptive statistics on demographics of the overall sample are reported in Table 1. Of the total sample 123 students (63.4%) indicated that neither parent had college experience and 71 students (36.6%) indicated that one or the other parent had college experience. As noted in Table 1 of the overall sample, a majority of participants were female (n=132, 68%) as compared to male (n=62, 32%). About half of the respondents were Hispanic (n=98, 50.5%). Whites (n=48), (24.7%) comprised the next largest group of respondents followed by Asian/Pacific Islanders (n=31,16%) and Blacks (n=17,8.8%). As mentioned, compared to the U.S. general college student composition, my sample had an unusually high number of Hispanic origin students. The discrepancy illustrates that racial-ethnic distribution can vary quite a lot from institution to institution.

As shown in Table 1, FGCS status by gender revealed that 72.4% of the first-generation sample was made-up of females as compared to 60.6% of non first-generation students.

The largest number of FGCS respondents (dfgcs=1) were classified as Hispanic 72 (58.5%), followed by 31 (25.2%) of White, 12 (9.8%) of Asian/Pacific Islander and 8 (6.5%) of black. On the other hand, for NFGCS respondents the composition was quite different. NFGCS

Table 1

Descriptive Statistics of Demographics on Overall Sample

Demographic Characteristic	N	%
Generation Status		
First-Generation College Student	71	36.6
Non First-Generation College Student	123	63.4
Gender		
Male	62	32.0
Female	132	68.0
Race/Ethnicity		
White	48	24.7
Black	17	8.8
Hispanic	98	50.5
Asian	31	16.0
Generation Status by Gender		
First-Generation Male	62	32.0
First-Generation Female	132	68.0
Non First-Generation Male	28	39.4
Non First-Generation Female	43	60.6
Generation Status by Race/Ethnicity		
First-Generation White	31	25.2
First-Generation Black	8	6.5
First-Generation Hispanic	72	58.5
First-Generation Asian	12	9.2
Non First-Generation White	17	23.9
Non First-Generation Black	9	12.7
Non First-Generation Hispanic	26	36.6
Non First-Generation Asian	19	26.8
Generation Status – Gender by Race/Ethnicity by FG Status		
Non First-Generation Male – White	8	38.1
Non First-Generation Male – Black	3	60.0
Non First-Generation Male – Hispanic	8	42.1
Non First-Generation Male – Asian	9	52.9
First-Generation Male – White	13	61.9
First-Generation Male – Black	2	40.0
First-Generation Male – Hispanic	11	57.9
First-Generation Male – Asian	8	47.1
Non First-Generation Female – White	9	33.3
Non First-Generation Female – Black	6	50.0
Non First-Generation Female – Hispanic	18	22.8
Non First-Generation Female – Asian	10	71.4
First-Generation Female – White	18	66.7
First-Generation Female – Black	6	50.0
First-Generation Female – Hispanic	61	77.2
First-Generation Female – Asian	4	28.6

respondents (dfgcs=0) were classified as Hispanic 26 (36.6%), followed by 19 (26.8%) of Asian/Pacific Islander, 17 (23.9%) of White and 9 (12.7%) of Black participants. As shown in Table 1, gender by race/ethnicity, 21 students (10.8%, overall percentage) were classified as White male; 5 (2.6%) as Black male; 19 (9.8%) as Hispanic male and 17 (8.8%) as Asian/Pacific Islander male. The same table shows that 27 (13.9% overall percentage) were classified as White female; 12 (6.2%) as Black female; 14 (7.2%) as Asian/Pacific Islander female; and 79 (60.7%) as Hispanic female.

Among White males, 8 (38.1%) students were classified as NFGCS and 13 (61.9%) students were classified as FGCS. Among Black males, 3 (60%) students were classified as NFGCS and 2 (40%) students were classified as FGCS. Among Hispanic males, 8 (42.1%) students were classified as NFGCS and 11 (57.9%) students were classified as FGCS. Among Asian/Pacific Islander males, 9 (52.9%) students were classified as NFGCS and 8 (47.1%) students were classified as FGCS. Among White females, 9 (33.3%) students were classified as NFGCS and 18 (66.7%) students were classified as FGCS. In black female 6 (50%) students were classified as NFGCS and 6 (50%) students were classified as FGCS. Among Hispanic females, 18 (22.8%) students were classified as NFGCS and 61 (77.2%) students were classified as FGCS. These data are shown in Table 1. Finally, among Asian/Pacific Islander females, 10 (71.4%) students were classified as NFGCS and 4 (28.6%) students were classified as FGCS. Finally, in summary, the demographic make-up of this study differs from a typical one in U.S. colleges and universities due to the large proportion of Hispanic respondents who identified themselves as both FGCS and NFGCS. The large number of Hispanic students makes this study interesting, because it allowed more precise inferences to be made on Hispanic students, which was not possible in previous studies conducted by Terenzini et al., (1995).

Data Analysis Results

This section reports findings from both chi-square analysis and descriptive Discriminate analysis using logistic regression. Any analysis that resulted in an alpha value less than .1 in the chi-square calculations was deemed statistically significant and the variables was used as independent variables of subsequent descriptive Discriminate analysis. The reason that I adopted a more liberal significance level (i.e. $p = .10$) than the conventional (i.e. $p = .05$) is that I did not want to fail to detect any variable that in fact differentiates FGCS and NFGCS in this rather small sample ($N=194$).

Plan of Analysis

The purpose of the study was to compare a freshman cohort of first and non first-generation college students enrolled in an urban university and to identify characteristics that distinguish the two groups in terms of selected demographics, pre-college behaviors, and beliefs (expectations and personal traits). Moreover, the study sought to identify variables whose distribution indicated a significant difference between the two groups and to rank those variables by the order of the strength of association.

Data analysis for this study consisted of a combination of chi-square and descriptive Discriminate analysis via logistic regression. The Statistical Package for the Social Sciences (SPSS) was used for both chi-square and logistic regression analysis. Chi-square analysis was the preliminary statistical procedure used in this study. Because the study contained numerous independent variables, I relied on a sequence of chi-square tests to help create a list of statistically and/or substantively significant variables to be used in conducting the descriptive Discriminate analysis (Johnson, 1998).

Descriptive Discriminate analysis via a logistic regression was used as the primary analysis for the study. The primary function of descriptive Discriminate analysis is to focus on revealing major differences among groups (Huberty, 1994). Because finding the students' characteristics that differentiate first and non first-generation college students was the major purpose of this study, and the outcome variable, generation status, is dichotomous, descriptive Discriminate analysis via logistic regression was chosen as the method of statistical analysis.

Chi-square Analysis Results

There were 60 variables I considered to develop a list of independent variables to be used for the logistic regression. This original list of variables was established by prior research as well as from the recommendations of such authors as Inman & Mayes (1999) and Terenzini, Springer, Yaeger, Pascarella, & Nora (1995). Chi-square analysis allowed me to determine whether there were statistically and/or substantively significant differences in proportions between first-generation and non first-generation students on the selected demographic, pre-college and belief variables.

In addition, I obtained the Cramer's phi coefficient for each variable. The Cramer's phi coefficient represents the strength of association between two categorical variables and thus can be used as an index of substantive importance of the relationship, as opposed to the chi-square test that is used for determining the statistical significance. According to Cohen's (1988, pp. 223-227) suggestion for interpreting Cramer's phi coefficient, a measure of strength of association is interpreted as follows: $.10 < \phi < .30$ = small effect size, $.30 < \phi < .50$ = medium effect size and $\phi > .50$ = large effect size. By rank ordering the Cramer's phi coefficient in descending order, I was able to know the relative substantive importance of the variable compared to other statistically significant variables.

After conducting chi-square analysis on the overall sample, I analyzed FGCS (FGCS vs. NFGCS) by splitting the students by race (White vs. non-White). Then, I analyzed FGCS (FGCS vs. NFGCS) by further splitting the students of color by ethnicity (Asian, African American and Hispanic) and compared each group to White students, because as will be discussed in the results of the overall analysis, the race/ethnicity variable was both statistically and substantially significant in the first chi-square analysis for the overall sample.

Significant Variables by Chi-square Test of Association by Generational Status Only

Table 2 indicates that there were 10 significant variables that distinguish first-generation and non first-generation students when looking at the overall sample. In the last column of the table, the direction of association was indicated either as a positive (+) or a negative (-). The positive sign indicates that as the generation status changes from NFGCS (coded as 0) to FGCS (coded as 1), the variable of interest has an increased proportion as the value increases. For example, the positive sign for the *dfemale* variable indicates that as generation status changes the value from 0 (NFGCS) to 1 (FGCS), there is a greater proportion of students when *dfemale* variable changes from 0 (male) to 1 (female). This means that there is a greater proportion of female students in the FGCS group than NFGCS group. Thus, it simply shows that the first-generation college students group has a higher proportion of female students than non first-generation college students group. In terms of strength of association, its Cramer's phi coefficient was .122, which was considered a small effect size according to the Cohen's rule of thumb. The size of the Cramer's phi coefficient, although small, indicates that there are differences in gender composition between first and non-first generation groups. Table 2 also

Table 2

Variables Significantly Associated with First-Generation Status in Respondent Group (N=179-194)

Variable	Valid N	Pearson Chi-square Value	df	P-value	Cramer's phi	Direction of Association
Dfemale	194	2.880	1	.09	.122	(+)
Race_ethn	194	14.412	3	.002	.273	(+)*
Income	179	17.479	11	.096	.312	(-)
Numapply	190	18.710	8	.016	.314	(-)
Act0114	193	5.263	2	.072	.165	(-)
Needrem4	194	5.642	1	.018	.171	(+)
Act0128	193	4.910	2	.086	.160	(-)**
Rate0103	193	11.062	4	.026	.239	(-)
Hpw0106	192	13.025	7	.071	.260	(+)
Hpw0111	191	8.814	7	.266	.215	(+)

Variables are statistically significant at the $\alpha = .10$ level, except Hpw0111.

Note: Dfemale-female; Race_ethn-Race/Ethnicity; Income-household income; Numapply-number of applications submitted to colleges and universities; Needrem4-need remedial social studies; Act0114-asked teacher for advice; Act0128-used personal computer; Rate0103-rate computer skills; Hpw0106-work for pay; and Hpw0111 – Reading for pleasure.

* Hispanic has more proportion in FGCS group than expected, and Black and Asian/Pacific Islander have more proportion in non-FGCS than expected.

** FGCS tend to split into extreme groups, (i.e., either in Frequently or Not at all).

highlights that *race/ethnicity* (represented by 'Race_ethn' variable) is a significant variable that distinguishes FGCS and NFGCS. Parent's Income (*Income*) is a significant variable that also distinguishes FGCS and NFGCS. First-generation students consisted of a higher proportion of students that came from household incomes less than \$40,000 per year as compared to more than \$50,000 per year for NFGCS. Parent's income yielded a Cramer's phi coefficient of .312. The size of the Cramer's phi coefficient is considered medium, which indicates that income is more strongly related to the generation status than gender.

For first-generation students the number of college applications (*Numapply*) they submit is a distinguishing factor between first and non first-generation college students. With regards to first-generation college students, they were more likely to submit fewer college applications for admissions. This variable's Cramer's phi coefficient of .314 indicates the effect size is medium when distinguishing students by generation status.

In the present study for first-generation students, asking a teacher for advice after class (*Act0114*) was a distinguishing factor between the two groups. The Cramer's phi coefficient of .165 yielded by this variable was considered small; however, it indicates that FGCS are less likely to ask a teacher for advice than non first-generation students. Remedial support also yielded a significant difference regarding generation status. First-generation students reported more need for remedial Social Studies (*Needrem4*) than did non first-generation students. Although this variable yielded a small Cramer's phi of .171, it indicates that there are differences in remedial perceived needs for Social Studies between first and non first-generation groups.

The present study revealed that personal computer (*Act0128*) use was significant. However, despite computer use being statistically significant, its Cramer's phi coefficient was .160. The size of this Cramer's phi coefficient is small; however, previous literature noted that

computer use does provide some important difference and should be considered when distinguishing students by generation status. It is noteworthy that these data showed first-generation students reported less use of personal computers overall and showed a tendency that personal computer use goes to two extremes (i.e., either Frequently or Not at all category).

Students were also asked to rate their overall computer skills (*Rate0103*). The data suggest that first-generation students consisted of a lower proportion of students who consider their overall computer skills above average. This variable yielded a Cramer's phi coefficient of .239. The Cramer's phi coefficient indicated that overall computer skill is more strongly related to the generation status than personal computer use.

As discussed in previous studies, many first-generation students are likely to have dependents (i.e., children, parents, brothers, and sisters) that rely on them for some type of financial assistance; because of this, many such students attend colleges near their homes so they can continue to work and provide their families financial support (Inman & Mayes, 1999). In the present study, a higher proportion of first generation students reported they would work during college (*Hpw0106*). The variable also yielded a small-to-medium effect size of Cramer's phi coefficient, .260 that provides some substantial difference when distinguishing the two groups.

Finally though it was not statistically significant, a pre-college behavior of reading for pleasure (*Hpw0111*) had a substantively significant association with first-generation status (Cramer's Phi = .215) and it had a tendency that first-generation students read more for pleasure than non first-generation peers.

*Significant Variables by Chi-square Test of Association by Generational Status Split into Race
(White Students and Students of Color)*

Results for White Students

Table 3 highlights the significant variables for White students group by chi-square test of association when the sample was split into two racial categories (White and students of color). For Whites, having felt overwhelmed (*Act0110*) and felt depressed (*Act0111*) during the past year were distinguishing factors between white first-generation student and White non first-generation students. These variables yielded Cramer's phi coefficient's of .465 and .383, respectively. The size of each Cramer's phi coefficient indicates that there are substantial differences between the white FGCS and white non FGCS groups. White first-generation students were more likely to have felt overwhelmed and depressed during the past year.

For whites, coming to class late (*Act0119*) was also a distinguishing factor between the two groups. The medium size Cramer's phi coefficient .318 indicates there is a substantial difference between white first-generation and first-generation students of color. White first-generation students were less likely to come to class late when compared to their white non first-generation peers.

Among students with goals to obtain a bachelor's degree, white first-generation students were more likely than white non first-generation students to believe they had a very good chance to earn a bachelor's degree (*Futact11*). This variable yielded a Cramer's phi coefficient of .372, which indicates that there are substantial differences between first and non first-generation groups. Additional findings from the study indicated that the groups also differ when participants were asked to indicate the importance of obtaining recognition from colleagues for contributions to their special field (*Goal0103*).

Table 3

Variables Significantly Associated with First-Generation Status in Sub-Sample Classified by Race White (N = 42-48)

Variable	Valid N	Pearson Chi-square Value	df	P-value	Cramer's phi	Direction of Association
Act0110	48	10.37	2	.006	.465	(+)
Act0111	48	7.05	2	.029	.383	(+)
Act0119	48	4.864	2	.088	.318	(-)
Futact11	47	6.499	3	.090	.372	(+)
Goal0103	48	6.897	3	.075	.383	(+)
Futact03	47	7.876	3	.049	.409	(-)
Numapply	48	9.401	5	.094	.443	(-)
Income	42	16.178	10	.095	.621	(-)
Reason05	48	6.181	2	.045	.359	(+)

Variables are statistically significant at the $\alpha = .10$ level.

Note: Act0110-felt overwhelmed; Act0111-felt depressed; Act0119-came to class late; Futact03-graduate with honors; Futact11-get Bachelor degree; Goal0103-obtain recognition from colleagues; Numapply-number of college applications completed; Reason05-gain a general education; and Income-household income.

White first-generation students were more likely to believe obtaining recognition from colleagues for contributions to their special field of study was important. This variable resulted in a Cramer's phi coefficient of .383, which indicates that there are substantial differences between groups.

One item asked to indicate if they thought they would graduate with honors (*Futact03*). With regards to White first-generation college students, they were less likely to believe they would graduate with honors. The Cramer's phi coefficient for this variable was .409, which indicates that graduating with honors is more strongly related to generation status than obtaining a bachelor degree (*Futact11*).

White first-generation students, in particular, were more likely to submit a fewer number of college applications for admissions (*Numapply*). The high Cramer's phi coefficient of .443 increases this variable's strength to distinguish the groups.

Parent's income also was identified as a distinguishing factor between White first-generation and white non first-generation students. White first-generation students' parents made less annual income than did White non first-generation students. Parent's income yielded a Cramer's phi coefficient of .621, which indicates that *income* is more strongly related to generation status than all other previously examined variables.

Among students with goals to gain a general education, White first-generation students were more likely than their White non first-generation peers to believe gaining a general education (*Reason05*) was very important. This variable yielded a Cramer's phi coefficient of .359 that indicates that there are substantial differences between first and non first-generation groups.

Results for Students of Color

Table 4 provides significant variables that distinguish FGCS and NFGCS status for students of color. Any tests that resulted in an alpha value less than .1 were again deemed significant.

Analysis by gender (*dfemale*) suggested that it was a significant variable that distinguishes FGCS and NFGCS status for non-white students. Although significant, the size of the Cramer's phi coefficient of .153 indicated that the difference in proportions is small. In addition to gender there were other variables that were significant. One such variable was parent's income. For first-generation students of color, parent's *income* was statistically significant. First-generation students of color were less likely than their non first-generation students of color to have family incomes of more than \$50,000 per year. Although the salaries for first-generation students' families ranged between \$20,000 and \$50,000, this variable yielded a medium effect size of Cramer's phi coefficient of .359, which indicated this variable was a substantially distinguishing factor between first and non first-generation students of color.

For students of color, having had or need remedial English (*Hadrem1*) was a distinguishing factor between first and non first-generation students. With regards to first-generation students of color, they were less likely to have had or need remedial English (*Hadrem1*). The reported Cramer's phi coefficient of .184 was small; however, it indicated this variable was a distinguishing factor between first and non first-generation students of color. Unlike remedial need for English, first-generation students of color were more likely to need remedial support in Social Studies (*Needrem4*). The Cramer's phi coefficient of .190, although small, indicated this variable is a distinguishing factor between first and non first-generation students of color. Similar differences were also found among students who were asked to rate

Table 4

Variables Significantly Associated with First-Generation Status in Sub-Sample Classified by Race Students of Color (N = 137-146)

Variable	Valid N	Pearson Chi-square Value	df	P-value	Cramer's phi	Direction of Association
Dfemale	146	3.403	1	.065	.153	(+)
Income	137	17.677	11	.089	.359	(-)
Hadrem1	146	4.952	1	.026	.184	(-)
Needrem4	146	5.254	1	.022	.190	(+)
Rate0103	145	9.115	4	.058	.251	(-)
Act0118	145	5.030	2	.081	.186	(-)
Act0112	146	5.189	2	.075	.189	(-)
Numapply	142	15.139	8	.056	.327	(-)**
Hpw0106	144	20.837	7	.004	.380	(-)*
Hpw0011	144	8.185	7	.317	.238	(+)
Reason01	145	5.136	2	.077	.188	(-)

Variables are statistically significant at the $\alpha = .10$ level, except Hpw0111.

Note: Dfemale-female; Act0112-Performed volunteer work; Act0118-Socialized with Diff/ethnic group; Hpw0106-Working for Pay; Hpw0111 – Reading for pleasure; Income-household income; Hadrem1-had remedial English; Needrem4-need remedial social studies; Numapply-number of other college applications submitted; and Reason01-Parents wanted me to go to college.

* FGCS of color tend to split into extreme groups (i.e., either no hours per week or 16-20 hours per week).

** FGCS of color tend to split into groups (i.e., either none or three).

their computer skills (*Rate0103*). First-generation students of color, were less likely to rate their computer skills above average. This variable resulted in a Cramer's phi coefficient of .251; thus indicating that this variable was a distinguishing factor for first and non first-generation groups.

Additional findings from the chi-square test indicated that first and non first-generation students of color differed with regards to socializing with different ethnic groups (*Act0118*). For first-generation students of color, they were less likely to socialize with different ethnic groups. The size of the Cramer's phi coefficient .186; although small, indicated this variable was a distinguishing factor between first and non first-generation students of color.

Such differences were also observed among first-generation students of color who performed volunteer work (*Act0112*). Performing volunteer work was a distinguishing factor between the two groups. In fact, first-generation students of color were less likely to perform volunteer work. This variable yielded a small Cramer's phi coefficient of .189, which indicated this variable was a distinguishing factor between first and non first-generation students of color, but was not very important substantively.

First-generation students of color on average worked more hours per week than non first-generation peers (*Hpw0106*). The variable also yielded a medium Cramer's phi coefficient of .380 that provided substantial difference when distinguishing the two groups. Another pre-college behavior reading for pleasure (*Hpw0111*) was found to be practically important for distinguishing first and non first-generation college students' status. Though it was not statistically significant, the Cramer's Phi was .238, which was ranked fifth among eleven variables.

Litten (1982) suggested that many students of color approach the college search process differently from white students. Litten went on to state that students of color and those who are

not less academically prepared for college tend to submit on average more college applications. The number of applications submitted for college (*Numapply*) was statistically significant. The direction of the association was complex. On average, however, first-generation students of color tended to submit less college applications than non first-generation peers, which was contrary to Litten's results. The Cramer's phi coefficient of .327, indicated that there were distinguishing differences between the first and non first-generation groups. This is, the pattern tended to split into two extremes such as either none or three, more applications.

According to Terenzini et al. (1995), many first-generation students lack the parental and peer encouragement to attend college, which has a direct impact on their decision to attend college as shown in Table 4. Parents encouraging students to attend college was significant (*Reason01*) and first-generation college students of color tended to receive less encouragement to attend college from their parents. However, its Cramer's phi coefficient was only .188.

Significant Variables by Chi-square Test of Association of Generational Status Split by Ethnicity (African American, Asian, and Hispanic)

Results for African American Students

Table 5 presents significant variables that distinguish African American FGCS and non FGCS groups when generation status was split by ethnicity. Performed volunteer work (*Act0112*) was statistically significant; hence, it was a distinguishing factor between first and non first-generation groups. The reported Cramer's phi coefficient of .660 was large. Therefore, this variable is important and indicated that African American first-generation performed substantively significantly less volunteer work than African American non first-generation students.

Such differences were also observed among students who came to class late (*Act0119*). For African American first-generation students, coming to class late was a distinguishing factor between the FGCS and non FGCS groups. With regards to African American students, first-generation students were less likely to come to class late. This variable yielded a large Cramer's phi coefficient of .540; thereby indicating this variable was a strong distinguishing factor between African American first and non first-generation students.

Remedial needs in math were also significant for African American first-generation students. The reported Cramer's phi coefficient of .436 is large and thus indicates that there are substantial differences in terms of needing or having had remedial Math between first and non first-generation groups. Surprisingly, African American first-generation students were less likely to report needing or having had remedial Math compared to African American non first-generation peers.

Table 5 also highlights that the number of hours study per week (*Hpw0101*) by African American students was statistically significant. The Cramer's phi coefficient was .814 the largest in the list in Table 5; hence, it indicates this variable is a very strong distinguishing factor between first and non first-generation African American students. African American first-generation students studied more hours per week than African American non first-generation students. Though it was not statistically significant, reading for pleasure (*Hpw0111*) had a practically strong association with first-generation status (Cramer's Phi = .568) and first-generation African American students tended to read more for pleasure than non first-generation African American students.

Table 5

Variables Significantly Associated with First-Generation Status in Sub-Sample Classified by Race/Ethnicity - African American Students subgroup (N=17)

Variable	Valid N	Pearson Chi-square Value	df	P-value	Cramer's phi	Direction of Association
Act0112	17	7.411	2	.025	.660	(-)
Act0119	17	4.958	2	.084	.540	(-)
Hadrem3	17	3.238	1	.072	.436	(-)
Hpw0101	17	11.266	5	.046	.814	(+)
Hpw0111	17	5.384	7	.600	.568	(+)
Reason01	17	10.119	2	.006	.772	(+)

Variables are statistically significant at the $p < .10$ level., except Hpw0111.

Note: Act0112-performed volunteer work; Act0119-came to class late; Hadrem3-had remedial Math; Hpw0101-studying/homework; Hpw0111 – Reading for Pleasure; and Reason01-parents wanted me to go to college.

Finally, parents wanting their sons, or daughters to attend college (*Reason01*) was significant. This variable yielded a very large Cramer's phi coefficient of .772; thus indicating that there were differences between first and non first-generation groups in terms of the pre-college behavior. African American first-generation students were more likely to have parents who wanted them to attend college than non first-generation African American peers.

Results for Hispanic Students

Table 6 provides a list of variables which showed significant differences for Hispanic students. When analyzed, gender (*dfemale*) was statistically significant. The Cramer's phi coefficient of .173 indicated that there were small differences in gender composition between the two groups. For Hispanic students, first-generation students had more females.

Remedial needs, with regards to English (*Hadrem1*), were significant. For Hispanic students, having had or needing remedial English was a distinguishing factor between first and non first-generation students. The Cramer's phi coefficient of .289 indicated this variable was a small to moderate distinguishing factor between first and non first-generation students. Hispanic first-generation students were less likely to have had remedial English.

There were also significant differences with regards to remedial writing experiences and needs (*Hadrem7*). The Cramer's phi coefficient of .226, though small indicated that this variable was a distinguishing factor between first and non first-generation students. Hispanic first-generation students were less likely to have had remedial writing experience and needs. Table 10 also shows that need for remedial support in Social Studies (*Needrem4*) was statistically significant. For Hispanics, remedial support in Social Studies was a distinguishing factor between first and non first-generation students. The size of the Cramer's phi coefficient was .191, which is a small effect size. Contrary to the previous two experiences and needs,

Table 6

Variables Significantly Associated with First-Generation Status in Sub-Sample Classified by Race/Ethnicity – Hispanic Student subgroup (N=97-98)

Variable	Valid N	Pearson Chi-square Value	df	P-value	Cramer's phi	Direction of Association
Dfemale	98	2.933	1	.087	.173	(+)
Hadrem1	98	8.190	1	.004	.289	(-)
Hadrem7	98	4.989	1	.026	.226	(-)
Hpw0106	97	15.665	7	.028	.402	(+)*
Hpw0111	97	7.479	5	.187	.278	(+)
Needrem4	98	3.579	1	.059	.191	(+)

Variables are statistically significant at the $\alpha = .10$ level, except Hpw0111.

Note: Dfemale-female; Hadrem1-had remedial English; Hadrem7-had remedial writing; Hpw0106-working for pay; Hpw0111 – Reading for pleasure; and Needrem4-need remedial social studies.

* FGCS tend to split into extreme groups, (i.e., no hours worked per week or 16-20 hours worked per week).

Hispanic first-generation students were more likely to feel the necessity of remedial support in Social Studies.

Working for pay (*Hpw0106*) was also significant. With regards to Hispanic students, first-generation students were more likely to work for pay during college. The Cramer's phi coefficient was .402, which is a medium effect size. In terms of reading for pleasure (*Hpw0111*) it was found substantively important (Cramer's Phi = .278), but not statistically significant. First-generation Hispanic students read more for pleasure than non first-generation peers.

Results for Asian American Students

Table 7 provides a list of variables that significantly distinguish Asian FGCS and non FGCS groups. For Asian Americans, remedial need in English (*Needrem1*) was significant and was a distinguishing factor between first and non first-generation students. The reported Cramer's phi coefficient of .423 indicated that having needed remedial English was a substantial difference between first and non first-generation groups. Asian American first-generation students were more likely to need remediation in English.

For Asian American first-generation students, remedial need for reading (*Needrem2*) was also significant. The medium size Cramer's phi coefficient .367 indicated that there were differences between first and non first-generation groups. Asian American first-generation students were more likely to need remediation in reading on average, but showed a pattern that split into the two extremes.

Having felt overwhelmed (*Act0110*) and felt depressed (*Act0111*) were both statistically significant. The Cramer's phi coefficients were .528 and .560, respectively. The size of each Cramer's phi coefficient indicated that these variables are strong distinguishing factors between first and non first-generation students.

Table 7

Variables Significantly Associated with First-Generation Status in Sub-Sample Classified by Race/Ethnicity – Asian American Student subgroup (N=29-31)

Variable	Valid N	Pearson Chi-square Value	df	P-value	Cramer's phi	Direction of Association
Needrem1	31	5.552	1	.018	.423	(+)
Needrem2	31	4.178	1	.041	.367	(+)*
Act0110	31	8.638	2	.013	.528	(-)
Act0111	31	9.725	2	.008	.560	(-)
Act0114	31	4.868	2	.088	.396	(-)**
Act0118	31	9.567	2	.008	.556	(-)
Act0124	31	5.711	2	.058	.429	(-)
Act0126	29	7.110	2	.029	.495	(-)
HSGPA	30	12.011	6	.062	.633	(-)
Hpw0106	30	13.175	7	.068	.663	(-)
Hpw0111	30	3.885	5	.566	.360	(+)
Futact01	31	6.433	3	.092	.456	(-)
Futact09	31	6.878	2	.032	.471	(-)

Variables are statistically significant at the $\alpha = .10$ level, except Hpw0111.

Note: Needrem1-need remedial English; Needrem2-need remedial reading; Act0110-felt overwhelmed; Act0111-felt depressed; Act0114-Asked teacher for advice after class; Act0118-socialized w/diff ethnic group; Act0124-used internet for research; Act0126-other internet use; HSGPA-high school grade point average; Hpw0106-working for pay; Futact01-change major field of study; and Futact09-make at least a "B" average.

* FG Asian American students split evenly across categories (Do not need or Will need remedial support)

* FG Asian American student split evenly across all categories (i.e., Not at all, Occasionally and Frequently).

Asian American first-generation students were less likely to have felt overwhelmed or felt depressed during the past year prior to participating in the study compared to peer non first-generation Asian American students.

For Asian American students, asking teachers for advice (*Act0114*) was also statistically significant. The Cramer's phi coefficient of .396 indicated that this variable was a moderate distinguishing factor between first and non first-generation students. Asian American first-generation students were less likely to ask teachers for advice on average, but the tendency was split into two extremes. Additional findings revealed that socializing with different ethnic groups (*Act0118*) was significant for Asian American students. The large Cramer's phi coefficient of .556 indicated that there were large differences between first and non first-generation groups. Asian American first-generation students were less likely to socialize with different ethnic groups.

Using the internet for research (*Act0124*) was also significant for Asian American students. The Cramer's phi coefficient of .429 indicated that this variable was a moderate to strong distinguishing factor between first and non first-generation students. Asian American first-generation students were less likely than Asian American non first-generation students to use the internet for research.

Asian first-generation students revealed similar findings when asked about other internet use (*Act0126*). The medium Cramer's phi coefficient of .495 indicated that this variable was a moderate to strong distinguishing factor between first and non first-generation students. Asian American first-generation students were less likely to use the internet for other uses.

For Asian American students, high school grade point average (*HSGPA*) was also significant; hence, it was a distinguishing factor between first and non first-generation students.

The Cramer's phi coefficient was .633, which is a large effect size. Asian American first-generation students tended to have lower high school GPAs than non first-generation Asian American peers.

Working for pay (*Hpw0106*) was significant for Asian group. The size of the Cramer's phi coefficient of .663 indicated that this variable was a strong distinguishing factor between first and non first-generation students. Contrary to the results found in overall sample, Asian American first-generation students were less likely to work for pay during college than Asian American non first-generation students.

First-generation Asian American students tended to have read more for pleasure (Cramer's Phi = .360) as was found in other race/ethnicity groups of students of color. Again, it was not statistically significant, but was practically significant with a medium effect size measured by the Cramer's Phi.

Changing major field of study (*Futact01*) also yielded significant results for Asian American students. The Cramer's phi coefficient was .456, which is a moderate to large effect size. Asian American first-generation students were less likely to change major field of study during college than Asian American non first-generation students.

In line with their greater need for remediation, first-generation students may not perform as well as their non first-generation peers. Asian students' expectation to earn at least a "B" average (*Futact09*) was statistically significant. Asian American first-generation students were less likely to believe they could earn at least a "B" average while in college. The size of the Cramer's phi coefficient of .471 indicated that this variable was a moderate distinguishing factor between first and non first-generation students.

Summary of Significant Variables that Distinguish FGCS and NFGCS by Different Classification Schemes

Table 8 lists the significant variables that distinguished FGCS and NFGCS by three classification schemes. The order that each variable was ranked indicated its strength of association as it relates to distinguishing between first and non first-generation groups. Specifically, the intent of this index was to measure the strength of the association among variables.

As shown in Table 8, for Whites, income was the most distinguishing factor between first and non first-generation groups. However, with regard to students of color, working for pay (*Hpw0106*) was the most important factor that distinguishes between first and non first-generation students.

Table 8 also highlights the variables' effect size when the sample was separated by ethnicity (i.e., Black, Asian, and Hispanic) in distinguishing FGCS and non FGCS. For Blacks, studying and/or doing homework (*Hpw0101*) was the most distinguishing factor between first and non first-generation students. However, on the other hand, for both Asian and Hispanic students working for pay (*Hpw0106*) were the most important factor that distinguishes first and non first-generation groups. With regards to Hispanic students, first-generation students were more likely to work during college on average. However, the opposite was true for Asian first-generation college students.

Table 8

Summary Table – Significant Variables that Distinguish FGCS and NFGCS by Each Classification

Overall Sample		Subgroups by Race				Subgroups by Ethnicity					
(N =179-194)		White (N = 42-48)		Non-White (N = 137-166)		Black (N =17)		Hispanic (N = 97-98)		Asian (N = 29-31)	
Variable	Cramer's phi	Variable	Cramer's phi	Variable	Cramer's phi	Variable	Cramer's phi	Variable	Cramer's phi	Variable	Cramer's phi
Numapply	.314	Income	.621	Hpw0106	.380	Hpw0101	.814	Hpw0106	.402	Hpw0106	.663
Income	.312	Act0110	.465	Income	.359	Reason01	.772	Hadrem1	.289	HSGPA	.633
Race_ethn	.273	Numapply	.443	Numapply	.329	Act0112	.660	Hpw0111	.278	Act0111	.560
Hpw0106	.260	Futact03	.409	Rate0103	.251	Hpw0111	.568	Hadrem7	.226	Act0118	.556
Rate0103	.239	Act0111	.383	Hpw0111	.238	Act0119	.540	Needrem4	.191	Act0110	.528
Hpw0111	.215	Goal0103	.383	Needrem4	.190	Hadrem3	.436	Dfemale	.173	Act0126	.495
Needrem4	.171	Futact11	.372	Act0112	.189	-	-	-	-	Futacto09	.471
Act0114	.165	Reason05	.359	Reason01	.188	-	-	-	-	Futact01	.456
Act0128	.160	Act0119	.318	Act0118	.186	-	-	-	-	Act0124	.429
Dfemale	.122			Hardrem1	.184	-	-	-	-	Needrem1	.423
-	-	-	-	Dfemale	.153	-	-	-	-	Act0114	.396
-	-	-	-	-	-	-	-	-	-	Needrem2	.367
-	-	-	-	-	-	-	-	-	-	Hpw0111	.360

Note: Dfemale-female; Income-household income; Numapply-number of applications submitted to colleges and universities; Needrem4-need remedial social studies; Act0114-asked teacher for advice; Act0128-used personal computer; Rate0103-rate computer skills; Hpw0101-study/homework; Hpw0106-working for pay;Hpw0111-reading for pleasure; Futact03-graduate with honors; Futact11-get bachelor degree; Hadrem1-had remedial English; Hadrem3-had remedial Math; Hadrem7-had remedial writing; Needrem1-need remedial English; Needrem2-need remedial reading; Act0110-felt overwhelmed; Act0111-felt depressed; Act0112-performed volunteer work; Act0118-socialized w/diff ethnic group; Act0124-used internet for research; Reason1-parents want me to go to colleges; Reason05-gain a general education; Act0119-came to class late; Act0126-other internet use; Goal0103-recognition from colleagues; Race_ethn-Student's race; HSGPA-high school grade point average; and Futact01-change major field of study.

Note that reading for pleasure (*Hpw0111*) never was shown to be statistically significant association, but appeared as a substantively important variable in the overall sample, in the non-White (i.e., students of color) subgroup, and in any subgroups classified by ethnicity status, such as African American, Hispanic and Asian. The relatively large effect size measured by Cramer's Phi compared to other statistically significant variables indicated that the variable should not be ignored when considering distinguishing characteristics of generation status.

It should be noted, however, that the series of chi-square analyses conducted only served as a preliminary analysis and should not be used for final results because there are at least three major shortcomings. First, one of the assumptions of chi-square test, which requires a minimum of five expected counts per cell were not met in many of the chi-square analyses conducted above. Second, the chi-square analysis only indicates the statistical significance of the relationship between two categorical variables, but it does not allow for analyzing multiple variables jointly. Without considering potential independent variables jointly, it is difficult to report any net impact of the independent variable on generation status.

Descriptive Discriminate Analysis Results

Descriptive Discriminate analysis using logistic regression overcomes those shortcomings of chi-square analysis because this technique can handle multiple independent variables at the same time. Descriptive Discriminate analysis via logistic regression is simply a logistic regression in terms of statistical technique, but the goal is different from that of logistic regression, which aims at finding a set of predictors that best predict the dichotomous outcome variable (Huberty, 1994). Thus, the goal of logistic regression is prediction, but the goal of descriptive discriminate analysis via logistic regression is to find a set of variables and the weights that best differentiate the two groups classified by the dichotomous outcome variable.

This goal is in fact the goal of descriptive discriminate analysis, which focuses on describing and revealing major differences through Discriminate function. When the logistic regression model is used for achieving this goal, the structural part of the logistic regression model serves as the Discriminate function (Johnson, 1998). The procedure is a powerful tool because it provides insights into (a) which, if any, variables used in a model are useful in differentiating among criterion groups, (b) which variables are most effective in classifying individuals into criterion groups, and (c) how accurate a derived discriminate variable is in actually predicting outcomes (Huberty, 1994).

The major purpose of the present study was to find a set of student characteristics that best distinguishes the first-generation college students from the non first-generation college students and rank order them using a logistic regression model as the purpose of descriptive discriminate analysis.

The descriptive discriminate analysis, using logistic regression, was conducted to identify which variables would be most effective in differentiating FGCS and Non FGCS and thus identifying characteristics that would most likely indicate first-generation status. To conduct the descriptive discriminate analysis via a logistic regression, I proceeded in the following way.

Since race/ethnicity and gender were identified as the fundamental demographic characteristics and they have a statistically significant relationship with the FGCS status, I first entered those into a logistic regression model to see if they were significant. When I entered race/ethnicity variable (*race_ethn*) and gender variable (*dfemale*) jointly into the model, the results showed that the partial regression coefficient for *dfemale* was not statistically significant, but the coefficients for the race/ethnicity dummy variables were statistically significant. This implies that when race/ethnicity and gender were considered jointly, gender did not explain

uniquely the portion of variability in the outcome variable. Therefore, I removed the gender variable from the model. The result for the logistic regression using only race/ethnicity as an independent variable is shown in Table 9 and confirmed that race/ethnicity was a significant characteristic to predict the FGCS status (Wald Chi-square = 13.593, p-value = .004). Also observe that this result mirrors the results reproduced in Table 1. The way that the logit (η_i) is transformed into the probability of being a first-generation college student $P^{(i)}$ was shown in Table 9. See also Appendix B for the graphs illustrating the relationships between logit (η) and probability (P).

This model served as a baseline model that was elaborated upon by including other potential significant independent variables, which were listed in Table 8. The variables were entered by the order of Cramer's phi across all the classification schemes shown in Table 8. When I entered an independent variable, I also created the interaction terms with race/ethnicity variable, because Table 8 indicated such interaction effects. If the interaction between a certain variable and race/ethnicity showed statistical significance, which was determined by my chosen cut-off α level of .10, I kept the interaction terms in the model. If the interaction was not statistically significant, I dropped the interaction terms and then refitted the data with only the main effect. If the main effect was again not statistically significant, then I dropped the variable completely from the model.

Table 9

Logistic Regression of First Generation Status by Race/Ethnicity

a) Results of the Logistic Regression

Parameter	Estimate (β)	Standard Error	Wald Chi-square	df	P-value	Odds Ratio (Exp β)
Intercept	.601	.302	3.963	1	.047	1.824
Race_ethn			13.593	3	.004	
Race_ethn(1) (Blk)	-.719	.572	1.578	1	.209	.478
Race_ethn(2) (Hisp)	.418	.379	1.217	1	.270	1.519
Race_ethn(3) (AA)	-1.060	.476	4.952	1	.026	.346

Note: *Race_ethn(1)* variable is a dummy variable for Black; *Race_ethn(2)* is a dummy variable for Hispanic; and *Race_ethn(3)* is a dummy variable for Asian, and therefore, white served as the reference group.

b) Relationship of Table 13 to Table 3

$$\eta_i = \log\left(\frac{p_i}{1 - p_i}\right)$$

and

$$\eta_i = \beta_0 + \beta_1 dBlack + \beta_2 dAsian + \beta_3 dHispanic$$

Group	logit(η_i)	Probability (P^i)	Interpretation
White	.601	0.646	64.6% of White students are FGCS
Black	.601 - .719 = -0.118	0.471	47.1% of Black students are FGCS
Hispanic	.601 + .418 = 1.019	0.735	73.5% of Hispanic students are FGCS
Asian	.601 - 1.060 = -0.459	0.387	38.7% of Asian students are FGCS

DesJardins (2001) explained, “the dependent variable in logistic regression model is the logarithm of the odds of the occurrence of a particular outcome or event” (p. 2). In this case the outcome or the event of interest was first-generation status. $P^{(i)}$ is the probability that a student will be first-generation and the $1 - P^{(i)}$ is the probability that a student is not first-generation. The outcome was estimated in log-form. In other words, the equation predicts the *log-odds* of being first-generation and not the probability of being first-generation itself. Note that the log odds is

$$\eta = \log\left(\frac{p}{1-p}\right)$$

denoted as η and defined as: , and the relationship between log odds (η) and probability (P) is depicted in Figure 1 and Figure 2 in Appendix B.

After repeating this process for all the potential predictors, the final model that I reached was the following:

Equation (1)

$$\eta = \log\left(\frac{p_i}{1-p_i}\right)$$

and

$$\begin{aligned} \eta_i = & \beta_0 + \beta_1 dBlack_i + \beta_2 dHispanic_i + \beta_3 dAsian_i + \beta_4 income_i + \beta_5 Hpw011_i + \beta_6 rate0103_i \\ & + \beta_7 act0114_i + \beta_8 act0110_i + \beta_9 (dBlack \times act0110)_i + \beta_{10} (dHispanic \times act0110)_i \\ & + \beta_{11} (dAsian \times act0110)_i + \beta_{12} goal0103_i + \beta_{13} futact11_i + \beta_{14} reason05_i \\ & + \beta_{15} (dBlack \times reason05)_i + \beta_{16} (dHispanic \times reason05)_i + \beta_{17} (dAsian \times reason05)_i \\ & + \beta_{18} hsgpa_i + \beta_{19} (dBlack \times HSGPA)_i + \beta_{20} (dHispanic \times hsgpa)_i \\ & + \beta_{21} (dAsian \times HSGPA)_i + \beta_{22} futact01_i \end{aligned}$$

where the independent variable expressed by a multiplication sign (\times) in between two variables represent the interaction terms between the two variables that are located in both sides of it. For example, $dBlack \times Act0110$ term in Equation 1 represents the interaction between *dBlack* and *Act0110* (Felt overwhelmed).

Table 10 reports the results of the logistic regression model represented in Equation 1. In Table 10, race/ethnicity was coded as follows: *Race-ethn*(1) = black, *Race-ethn*(2) = Hispanic, and *Race-ethn*(3) = Asian. Thus, White students served as the reference group.

The result provided by the descriptive discriminate analysis via a logistic regression indicated the following: *Race/ethnicity* had an interaction effect with these three variables *Act0110*, *Reason05*, and *HSGPA*. The first interaction effect was between *race/ethnicity* and “have felt overwhelmed” (*Act0110*). This interaction showed that the effect of *Act0110* on FGCS status depended on students’ race/ethnicity. Second, it was revealed that there is an interaction effect between race/ethnicity and a “student wanting to gain a general education” (*Reason05*). Again this interaction effect suggested that (*Reason05*) on FGCS status depends on a students’ race/ethnicity. Third the impact of high school GPA (*hsgpa*) on FGCS status also depended on the students’ race/ethnicity. Race/ethnicity had an interaction effect with these three variables.

The other variables, such as, Parent’s Income (*income*), reading for pleasure (*hpw0111*), rate computer skills (*rate0103*), recognition from colleagues (*goal0103*), get bachelor’s degree (*futact11*), and change major field of study (*futact01*), only had a main effect. Because there were three variables that interacted with race/ethnicity, it is important to discuss the relationship separately by race/ethnicity. Thus, from Equation 1, the following equations were obtained for each race/ethnicity group.

Equation (2)

White: $\eta_i = \beta_0 + \beta_4 income_i + \beta_5 Hpw0111_i + \beta_6 rate0103_i + \beta_7 act0114_i$
 $+ \beta_8 act0110_i + \beta_{12} goal0103_i + \beta_{13} futact11_i + \beta_{14} reasons05_i$
 $+ \beta_{18} hsgpa_i + \beta_{22} futact01_i$

Black: $\eta_i = (\beta_0 + \beta_1) + \beta_4 income_i + \beta_5 hpw0111_i + \beta_6 rate0103_i + \beta_7 act0114_i$
 $+ (\beta_8 + \beta_9) act0110_i + \beta_{12} goal0103_i + \beta_{13} futact11_i + \beta_{14} reason05_i + \beta_7 act0114_i$
 $+ (\beta_{18} + \beta_{19}) HSGPA_i + \beta_{22} futact01_i$

Table 10

Overall Results of Descriptive Discriminate Analysis Using Logistic Regression of FGS

Parameter	Estimate (β)	Standard Error	Wald Chi-square	df	P-value	(Exp β)
Intercept β_0	-5.077	3.248	2.443	1	.118	.006
Race_ethn			5.618	3	.132	
Race_ethn(1) dBlack β_1	-5.212	8.170	.407	1	.523	.005
Race_ethn (2) dHisp β_2	5.320	3.699	2.069	1	.150	204.339
Race_ethn (3) dAsian β_3	14.141	7.198	3.860	1	.049	1384344.1
Income β_4	-.204	.089	5.269	1	.022	.815
Hpw0111 β_5	.742	.209	12.562	1	.000	2.100
Rate0103 β_6	-.662	.288	5.290	1	.021	.516
Act0114 β_7	-.846	.354	5.702	1	.017	.429
Act0110 β_8	.457	.665	.471	1	.493	1.579
Race_ethn*act0110			10.151	3	.017	
Race_ethn (1) by act0110 β_9	-.927	1.304	.506	1	.477	.396
Race_ethn (2) by act0110 β_{10}	.217	.889	.060	1	.807	1.242
Race_ethn (3) by act0110 β_{11}	-5.452	1.844	8.736	1	.003	.004
Goal0103 β_{12}	.437	.288	2.297	1	.130	1.548
Futact11 β_{13}	.776	.310	6.255	1	.012	2.172
Reasons05 β_{14}	1.891	.874	4.686	1	.030	6.627
Race_ethn * reasons05			8.990	3	.029	
Race_ethn (1) by reasons05 β_{15}	.475	2.506	.036	1	.850	1.609
Race_ethn (2) by reasons05 β_{16}	-3.466	1.202	8.315	1	.004	.031
Race_ethn (3) by reasons05 β_{17}	-2.122	1.664	1.627	1	.202	.120
HSGPA β_{18}	-.233	.300	.601	1	.438	.792
Race_ethn * HSGPA			5.924	3	.115	
Race_ethn (1) by HSGPA β_{19}	.650	.686	.899	1	.343	1.916
Race_ethn (2) by HSGPA β_{20}	.749	.366	4.191	1	.041	2.116
Race_ethn (3) by HSGPA β_{21}	-.152	.514	.087	1	.768	.859
Futact01 β_{22}	.469	.272	2.990	1	.084	1.599

Variable(s) entered on step 1: race_ethn, income, hpw0111, rate 0103, act0114, act0110, race_ethn*act0110, goal0103, futact11, race_ethn*reason05, hsgpa, race_ethn*hsgpa, futact01

$$\begin{aligned} \text{Hispanic: } \eta_i &= (\beta_0 + \beta_2) + \beta_4 \text{income}_i + \beta_5 \text{hpw0111}_i + \beta_6 \text{rate0103}_i + \beta_7 \text{act0114}_i \\ &+ (\beta_8 + \beta_{10}) \text{act0110}_i + \beta_{12} \text{goal0103}_i + \beta_{13} \text{futact11}_i \\ &+ (\beta_{14} + \beta_{16}) \text{reason05}_i + (\beta_{18} + \beta_{20}) \text{HSGPA}_i + \beta_{22} \text{futact01}_i \end{aligned}$$

$$\begin{aligned} \text{Asian: } \eta_i &= (\beta_0 + \beta_3) + \beta_4 \text{income}_i + \beta_5 \text{hpw0111}_i + \beta_6 \text{rate0103}_i + \beta_7 \text{act0114}_i \\ &+ (\beta_8 + \beta_{11}) \text{act0110}_i + \beta_{12} \text{goal0103}_i + \beta_{13} \text{futact11}_i \\ &+ (\beta_{14} + \beta_{17}) \text{reason05}_i + (\beta_{18} + \beta_{21}) \text{HSGPA}_i + \beta_{22} \text{futact11}_i \end{aligned}$$

By plugging the estimates of the intercept and the slopes in Table 14 into Equation 2, I obtained the following prediction equations for each race/ethnicity group. These prediction equations can be used to describe a best set of student's characteristics that discriminate the FGCS and NFGCS status for each race/ethnicity group. Those prediction equations are:

Equation (3)

$$\begin{aligned} \text{White: } \eta_i &= -5.077 - .204 \text{income}^i + .742 \text{HpW0111}^i - .662 \text{rate0103}^i - .846 \text{act0114}^i + .457 \\ &\text{act0110}^i + .437 \text{goal0103}^i + .776 \text{futact11}^i + 1.891 \text{reason05}^i - .233 \text{HSGPA} + .469 \\ &\text{futact01}^i \end{aligned}$$

$$\begin{aligned} \text{Black: } \eta_i &= -10.289 - .204 \text{income}^i + .742 \text{HpW0111}^i - .662 \text{rate0103}^i - .846 \text{act0114}^i + .470 \\ &\text{act0110}^i + .437 \text{goal0103}^i + .776 \text{futact11}^i + 2.336 \text{reason05}^i + .417 \text{HSGPA} + .469 \\ &\text{futact01}^i \end{aligned}$$

$$\begin{aligned} \text{Hispanic: } \eta_i &= .243 - .204 \text{income}^i + .742 \text{HpW0111}^i - .662 \text{rate0103}^i - .846 \text{act0114}^i + \\ &.674 \text{act0110}^i + .437 \text{goal0103}^i + .776 \text{futact11}^i - 1.575 \text{reason05}^i + .516 \text{HSGPA} \\ &+ .469 \text{futact01}^i \end{aligned}$$

$$\begin{aligned} \text{Asian: } \eta_i &= 9.064 - .204 \text{income}^i + .742 \text{HpW0111}^i - .662 \text{rate0103}^i - .846 \text{act0114}^i - \\ &4.995 \text{act0110}^i + .437 \text{goal0103}^i + .776 \text{futact11}^i - .231 \text{reason05}^i - .385 \text{HSGPA} \\ &+ .469 \text{futact01}^i \end{aligned}$$

Descriptive Discriminate Analysis Results for White Students

Table 11 indicates that there were eight statistically significant variables (whose estimates were marked with asterisks such as * or **) that distinguished White first-generation students from White non first-generation students. When comparing white non first-generation college students and White first-generation college students, White students who come from households with higher incomes were significantly less likely to be first-generation college students (-.204, $p < .05$).

When comparing White non first-generation college students and White first-generation college students, White students who read for pleasure (*Hpw0111*) were significantly more likely to be first-generation students (.724, $p < .05$). White college students who rated their computer skills as less than average (*Rate0103*) were significantly less likely to first-generation college students when compared to their White non first-generation peers (-.662, $p < .05$). White students who asked teachers for advice (*Act0114*), were significantly less likely to first-generation. (-.846, $p < .05$). When comparing the two groups, White college students who believed gaining recognition from colleagues (*Goal0103*) were significantly more likely to be first-generation students (.437, $p < .10$). White college students who believed it is very important to earn a bachelor's degree (*Futact11*) were significantly more likely to be first-generation college students when compared to White non first-generation college students (.776, $p < .05$). When compared with their White non first-generation peers, White first-generation college students who reported gaining a general education (*Reason05*) is important were significantly more likely to be first-generation students (1.891, $p < .05$). When compared to White non first-generation college students, White students who said there is little chance they will change their major (*Futact01*) were significantly more likely to be first-generation college students (.469, $p < .10$).

Table 11

Results of Descriptive Discriminate Analysis on First-Generation Status for White Students

Parameter	Estimate (β)	Standard Error	Wald Chi-square	df	P-value	Odds Ratio (Exp β)	Standardized Estimate
Intercept	-5.077	3.248	2.443	1	.118	.006	
Income	-.204**	.0895	.269	1	.022	.815	-.343
Hpw0111	.742**	.209	12.563	1	.001	2.100	.586
Rate0103	-.662**	.2885	.290	1	.021	.516	-.328
Act0114	-.846**	.3545	.702	1	.017	.429	-.334
Act0110	.457	.665	.471	1	.493	1.579	.162
Goal0103	.437*	.2882	.297	1	.130	1.548	.217
Futact11	.776**	.3106	.255	1	.012	2.172	.321
Reason05	1.891**	.8744	.686	1	.030	6.627	.548
HSGPA	-.233	.300	.601	1	.438	.792	-.217
Futact01	.469*	.2722	.990	1	.084	1.559	.235

Note: Income-household income; Hpw0111-reading for pleasure; Rate0103-rate computer skills; Act0114-asked teacher for advice; Act0110-felt overwhelmed; Goal0103-recognition from colleagues; Futact11-get bachelor degree; Reason05-gain a general education; HSGPA-high school grade point average; and Futact01-change major field of study.

Note: ** p-value < .05
* p-value \approx .10

Descriptive Discriminate Analysis Results for Black Students

Table 12 indicates that there were eight statistically significant variables that distinguish Black first-generation students from Black non first-generation students. When comparing Black non first-generation students and Black first-generation students, black students who come from households with higher incomes were significantly less likely to be first-generation college students (-.204, $p < .05$).

When comparing Black non first-generation college students and Black first-generation college students, Black students who indicated they read for pleasure (*Hpw0111*) were significantly more likely to be first-generation students (.742, $p < .05$). Black college students, who rated their computer skills as above average (*Rate0103*), were significantly less likely to be first-generation college students when compared to Black non first-generation peers (-.662, $p < .05$). Black students, who reported they occasionally asked teachers for advice (*Act0114*), were significantly less likely to be first-generation (-.846, $p < .05$).

When comparing Black non first-generation college students and Black first-generation college students who believe gaining recognition from colleagues (*Goal0103*) is important were significantly more likely to be first-generation students (.437, $p < .10$). Black college students who believed it is very important to earn a bachelor's degree (*Futact11*) were significantly more likely to be first-generation college students (.776, $p < .05$). When compared with their Black non first-generation peers, Black college students who reported gaining a general education (*Reason05*) is important were significantly more likely to be first-generation students (2.366, $p < .05$). Black college students who said there is little chance they will change their major (*Futact01*) were significantly more likely to be first-generation college students (.469, $p < .10$).

Table 12

Results of Descriptive Discriminate Analysis on First-Generation Status for African American Students

Parameter	Estimate (β)	Standard Error	Wald Chi-square	df	P-value	Odds Ratio (Exp β)	Standardized Estimate
Intercept	-10.289	8.1601	.590	1	.207	.00003	
Income	-.204**	.0895	.269	1	.022	.815	-.343
Hpw0111	.742**	.209	12.563	1	<.001	2.100	.586
Rate0103	-.662**	.2885	.290	1	.021	.516	-.328
Act0114	-.846**	.3545	.702	1	.017	.429	-.334
Act0110	-.470	1.142	.170	1	.680	.625	-.166
Goal0103	.437*	.2882	.297	1	.130	1.548	.217
Futact11	.776**	.3106	.255	1	.012	2.172	.321
Reason05	2.366**	2.393	.978	1	.323	10.661	.686
HSGPA	.417	.609	.470	1	.493	1.518	.389
Futact01	.469*	.2722	.990	1	.084	1.559	.235

Note: Income-household income; Hpw0111-reading for pleasure; Rate0103-rate computer skills; Act0114-asked teacher for advice; Act0110-felt overwhelmed; Goal0103-recognition from colleagues; Futact11-get bachelor degree; Reason05-gain a general education; HSGPA-high school grade point average; and Futact01-change major field of study.

Note: ** p-value < .05
* p-value \approx .10

Descriptive Discriminate Analysis Results for Hispanic Students

Table 13 indicates that there were nine statistically significant variables that distinguish Hispanic first-generation students from Hispanic non first-generation students. When comparing Hispanic non first-generation students and Hispanic first-generation students, Hispanic students who come from households with higher incomes were significantly less likely to be first-generation college students (-.204, $p < .05$).

When comparing Hispanic non first-generation college students and Hispanic first-generation college students, Hispanic students who indicated they read for pleasure (*Hpw0111*) were significantly more likely to be first-generation students (.742, $p < .05$). Hispanic students, who reported they rated their computer skills as above average (*Rate0103*), were significantly less likely to first-generation college students when compared to Hispanic non first-generation peers (-.662, $p < .05$). Hispanic college students, who reported they asked teachers for advice (*Act0114*), were significantly less likely to first-generation, when compared to Hispanic non first-generation counterparts (-.864, $p < .05$).

When compared to Hispanic non first-generation college students, Hispanic college students who believe gaining recognition from colleagues (*Goal0103*) is important were significantly more likely to be first-generation students (.437, $p < .10$). Hispanic college students who believed it is very important to earn a bachelor's degree (*Futact11*) were significantly more likely to be first-generation college students when compared to Hispanic non first-generation college students (.776, $p < .05$). When compared with their Hispanic non first-generation peers, Hispanic college students who reported gaining a general education (*Reason05*) is important were significantly less likely to be first-generation students (-1.575, $p < .05$).

Table 13

Results of Descriptive Discriminate Analysis on First-Generation Status for Hispanic students

Parameter	Estimate (β)	Standard Error	Wald Chi-square	df	P-value	Odds Ratio (Exp β)	Standardized Estimate
Intercept	.243	2.971	.0067	1	.935	1.275	
Income	-.204**	.0895	.269	1	.022	.815	-.343
Hpw0111	.742**	.209	12.563	1	<.001	2.100	.586
Rate0103	-.662**	.2885	.290	1	.021	.516	-.328
Act0114	-.846**	.3545	.702	1	.017	.429	-.334
Act0110	.674	.6051	.241	1	.265	1.961	.238
Goal0103	.437*	.2882	.297	1	.130	1.548	.217
Futact11	.776**	.3106	.255	1	.012	2.172	.321
Reason05	-1.575**	.8123	.763	1	.052	.207	-.456
HSGPA	.516*	.2135	.860	1	.015	1.676	.482
Futact01	.469*	.2722	.990	1	.084	1.559	.235

Note: Income-household income; Hpw0111-reading for pleasure; Rate0103-rate computer skills; Act0114-asked teacher for advice; Act0110-felt overwhelmed; Goal0103-recognition from colleagues; Futact11-get bachelor degree; Reason05-gain a general education; HSGPA-high school grade point average; and Futact01-change major field of study.

Note: ** p-value < .05
* p-value \approx .10

Hispanic students who reported a higher high school grade point average (*HSGPA*) were significantly more likely to be first-generation college students, when compared to Hispanic non first-generation college students (.516, $p < .10$). Hispanic college students who said there is little chance they will change their major (*Futact01*) were significantly more likely to be first-generation college students (.469, $p < .10$).

Descriptive Discriminate Analysis Results for Asian/Pacific Islander Students

Table 14 indicates that there were eight statistically significant variables that distinguish Asian first-generation students from Asian non first-generation students. When comparing Asian non first-generation students and Asian first-generation students, Asian students who come from households with higher incomes were significantly less likely to be first-generation college students (-.204, $p < .05$).

When comparing Asian non first-generation college students and Asian first-generation college students, Asian students who indicated they read for pleasure (*Hpw0111*) were significantly more likely to be first-generation students (.742, $p < .05$). Asian college students, who rated their computer skills as above average (*Rate0103*), were significantly less likely to be first-generation college students when compared to Asian non first-generation peers (-.662, $p < .05$).

Asian students, who reported they occasionally asked teachers for advice (*Act0114*), were significantly less likely to be first-generation, when compared to Asian non first-generation counterparts (-.846, $p < .05$). Asian students who indicated they felt overwhelmed (*Act0110*) were significantly less likely to be first-generation college students (-.4.995, $p < .05$).

Table 14

Results of Descriptive Discriminate Analysis on First-Generation Status for Asian/Pacific Islander students

Parameter	Estimate (β)	Standard Error	Wald Chi-square	df	P-value	Odds Ratio (Exp β)	Standardized Estimate
Intercept	9.064	6.560	1.909	1	.167	8638	.636
Income	-.204**	.0895	.269	1	.022	.815	-.343
Hpw0111	.742**	.209	12.563	1	<.001	2.100	.586
Rate0103	-.662**	.2885	.290	1	.021	.516	-.328
Act0114	-.846**	.3545	.702	1	.017	.429	-.334
Act0110	-4.995**	1.705	8.583	1	.003	.007	-.626
Goal0103	.437*	.2882	.297	1	.130	1.548	.217
Futact11	.776**	.3106	.255	1	.012	2.172	.321
Reason05	-.231	1.423	.026	1	.871	.793	-.067
HSGPA	-.385	.438	.772	1	.380	.681	-.359
Futact01	.469*	.2722	.990	1	.084	1.559	.235

Note: Income-household income; Hpw0111-reading for pleasure; Rate0103-rate computer skills; Act0114-asked teacher for advice; Act0110-felt overwhelmed; Goal0103-recognition from colleagues; Futact11-get bachelor degree; Reason05-gain a general education; HSGPA-high school grade point average; and Futact01-change major field of study.

Note: ** p-value < .05
* p-value \approx .10

When compared to Asian non first-generation college students, Asian college students who believe gaining recognition from colleagues (*Goal0103*) is important were significantly more likely to be first-generation students (.437, $p < .10$). Asian college students who believed it is very important to earn a bachelor's degree (*Futact11*) were significantly more likely to be first-generation college students when compared to Asian non first-generation college students (.776, $p < .05$). Asian college students who said there is little chance they will change their major (*Futact01*) were significantly more likely to be first-generation college students (.469, $p < .10$).

Table 15 summarizes 10 student characteristics (i.e. *Hpw0111*, *Reason05*, *Income*, *Act0114*, *Rate0103*, *Futact11*, *Futact01*, *Goal0103*, *HSGPA*, and *Act0110*) in the logistic regression model separately by race/ethnicity that are rank ordered by the absolute value of standardized coefficient, which enables me to compare the relative practical importance of the variable. The standardized coefficient (β_i^*) was calculated by the raw coefficient (β_i) divided by $\frac{\pi}{\sqrt{3}}$, which is the standard deviation of the standard logistic distribution, and then multiplied by the standard deviation of the independent variable (S^i) under consideration. That is,

$\beta_i^* = \beta_i \left(\frac{S_i}{\pi/\sqrt{3}} \right)$. Among them, seven characteristics (*Hpw0111*, *Income*, *Act0114*, *Rate0103*, *Futact11*, *Futact01* and *Goal0103*) were commonly statistically significant student characteristics across four race/ethnicity groups, and 3 out of 10 variables (*Reason05*, *HSGPA* and *Act0110*) were unique to one or some of the groups. These variables can be viewed as predictors that help identify the likelihood that a student is first-generation.

Table 15

Descriptive Discriminate Analysis – Importance of the Significant Variables Rank Ordered by Standardized Coefficient by Race/Ethnicity

	White	Black	Hispanic	Asian			
Hpw0111**	.586	Reason05**	.686	Hpw0111**	.586	Act0110**	-.626
Reason05**	.548	Hpw0111**	.586	HSGPA**	.482	Hpw0111**	.586
Income**	-.343	HSGPA	.389	Reason05*	-.456	HSGPA	-.359
Act0114**	-.334	Income**	-.343	Income**	-.343	Income**	-.343
Rate0103**	-.328	Act0114**	-.334	Act0114**	-.334	Act0114**	-.334
Futact11**	.321	Rate0103**	-.328	Rate0103**	-.328	Rate0103**	-.328
Futact01*	.235	Futact11**	.321	Futact11**	.321	Futact11**	.321
Goal0103*	.217	Futact01*	.235	Act0110	.238	Futact01*	.235
HSGPA	-.233	Goal0103*	.217	Futact01*	.235	Goal0103*	.217
Act0110	.162	Act0110	-.166	Goal0103*	.217	Reason05	-.067

Act0110 – Felt Overwhelmed, 1(Not at all) – 3(Frequently); Act0114 – Asked Teach for Advice, 1(Not at all) – 3(Frequently); Futact11, Get a Bachelor’s degree, 1(No chance) – 4(Very good chance); Futact01, Change major field of study, 1(No chance) – 4(Very good chance); Goal0103 – Obtain recognition; Hpw0111 – Reading for pleasure, 1 (none) – 8(Over 20 hours per week); HSGPA – High school grade point average, 1(D) – 8(A or A+); Income – Parent’s Income, 1(<\$6000) -14(>\$200,000); Rate0103 – Rate computer skills, 1(Lowest 10%) – 5(Highest 10%); Reason05 – Gain a general education, 1(Not important) – 3(important).

Note: *Common variables* – Act0114, Futact01, Futact11, Goal0103, Hpw0111, Income, and Rate0103.

Uncommon variables – Reasons05, HSGPA, and Act0110

** p-value < .05 * p-value ≈ .10

As shown in Table 15, for Whites, reading for pleasure (*Hpw0111*) was the most effective variable in classifying individuals into first-generation group. This variable was also most effective for Hispanic students.

However, with regards to Black students, the most effective variable in classifying Black students into the first-generation category was gaining a general education (*Reason05*). The most effective variable in classifying Asian students was having felt overwhelmed (*Act0110*).

Chapter Five

Discussion

The purpose of the study was to compare a freshman cohort of first and non first-generation college students enrolled in an urban university and to identify characteristics that distinguish the two groups in terms of selected demographics, pre-college behaviors, and beliefs (expectations and personal traits). Moreover, the study sought to identify variables whose distribution indicated a significant difference between the two groups and rank those variables by the order of the effect size represented by the standardized coefficient in logistic regression. This chapter summarizes the results of the study and discusses the findings in relation to the research questions. Then the results of this study are compared to those findings in prior research. A discussion of the implications of the findings for future professional practice, policy and research follows. Limitations to the study are also discussed. Finally, the chapter concludes with a discussion and recommendations for enhancing the college experience for first-generation college students.

The major emphasis of this study was to identify characteristics that increase the likelihood of predicting FGCS. To identify these characteristics and to obtain the answer for my research questions, I employed a chi-square and descriptive Discriminate analysis via logistic regression for the purpose of obtaining a set of significant student characteristics and the strengths of association of those variables. Since there were more than 60 variables to consider, I developed a list of candidate variables to be included in the logistic regression model using the chi-square two-way contingency table analyses as a preliminary analysis for the logistic regression model. The latter served as my primary analysis.

After obtaining those candidate variables, I first ran the logistic regression of FGCS status as the outcome variable (FGCS=1, NFGCS=0) using race/ethnicity variable as the only independent variable included in the model. Since I found that race/ethnicity was a significant distinguishing variable and this variable was a fundamental demographic variable, I decided to retain it in the model throughout the analysis. Then I started including the candidate variables that were identified by the chi-square analyses.

It should be noted that the chi-square analyses were used to identify a list of candidate variables that might distinguish the FGCS and NFGCS status and those variables were used as the independent variables to conduct the descriptive discriminate analysis using logistic regression. I used a logistic regression not to predict the first generation status; rather to obtain a set of characteristics, which would discriminate the likelihood of first-generation status.

To answer all three research questions, a descriptive discriminate analysis model was employed to determine whether the variables found in the chi-square analyses in fact distinguish the groups classified by generation status. The descriptive discriminate analysis indicated that 7 of 10 variables were characteristics that distinguished FGCS and NFGCS status regardless of race/ethnicity. Parent's annual income (*Income*), gender (*dfemale*), reading for pleasure (*Hpw0111*), rate computer skills (*Rate0103*), get a bachelor's degree (*Futact11*), change major field of study (*Futact01*), and obtain recognition from colleagues (*Goal0103*). The rest of these variables (i.e., gain general education (*Reason05*), High school GPA (*HSGPA*), and have felt overwhelmed (*Act0110*) were unique to one or more of the groups.

Interpretations of Results for Research Question One

In responding to research question one, I sought to identify selected demographic characteristics that distinguished first and non first-generation college students. Table 10 showed

that income, race/ethnicity, and high school GPA (*HSGPA*) were statistically significant variables that uniquely distinguished FGCS and NFGCS status. On the other hand, HSGPA had significant interaction effects with race/ethnicity (see Table 14). Specifically, HSGPA had a positive association with FGCS status for Black and Hispanic students, but had a negative association for White and Asian students. Age, living distance from campus, gender, and enrollment status were not statistically significant (See Table 14). Note that gender was statistically significant in the chi-square analysis, but was not statistically significant when other variables were entered into the analyses and thus were controlled for (i.e., race/ethnicity, income, and other student characteristics listed in Table 14 were controlled for in the logistic regression).

The results of the analyses to answer the first research question revealed that when considering parent's annual income (*Income*), students, regardless of race/ethnicity, who come from families with lower annual incomes are more likely to be first-generation. According to Gladieux and King (1999), access to higher education is, in theory, available to all, but the reality is that a student from a family with a higher socioeconomic status (\$75,000 or more annually) has an 86% chance of attending college by age 23, while a student with low socioeconomic status (\$50,000 or less annually) has only a 38% chance of doing so.

Race/ethnicity was a significant characteristic to predict student first-generation status. This simply means that proportions of students in first-generation status significantly differ across race/ethnicity groups. Specifically, being Hispanic, one is more likely to be first-generation compared to the reference group (White); however, being Asian or Black is less likely to be first-generation compared to White reference group (See Table 13).

Interpretation of Results for Research Question Two

In responding to research question two, I sought to identify selected pre-college behaviors that distinguished first and non first-generation college students, and if there were any interaction effects with race/ethnicity. As for pre-college behaviors from Table 14, one finds that “Reading for pleasure” (*Hpw0111*), “Rate your computer skills” (*Rate0103*), “Felt overwhelmed during the past year” (*Act0110*), and “Asked a teacher for advice after class” (*Acto0114*) were the statistically significant selected pre-college behavior variables that uniquely distinguished FGCS and NFGCS status. Moreover, having felt overwhelmed (*Act0110*) had significant interaction effects with race/ethnicity. Additional findings with respect to pre-college behaviors revealed that regardless of race/ethnicity, first-generation college students were less likely to ask a teacher for advice. It is also worth noting that first-generation students tended to be overwhelmed during the past year - this was more true for White and Hispanic first-generation students. The tendency for Black and Asian first-generation students; however, was opposite that of White and Hispanic first-generation students. Especially for Asians, first-generation students had substantively less feelings of having felt overwhelmed than the non first-generation peers (the slope estimate was -4.995 in Table 17).

The results showed that regardless of race/ethnicity, those who read for pleasure (*Hpw0111*) were more likely to be first-generation. This finding is interesting in that it suggests that the more a student reads, the more likely that student is to be first-generation. It is possible that this particular finding was some how affected by the sample employed in the study.

Findings associated with rating computer skills (*Rate0103*) revealed that first-generation students, regardless of race/ethnicity, who rated their computer skills below average were significantly more likely to be first-generation. These findings suggest that first-generation

students perceived that they have lower levels of computer skills. This finding is consistent with previous studies conducted by Terenzini et. al., (1995) that noted many first-generation students often have lower computer abilities.

Interpretation of Results for Research Question Three

In responding to research question three, I sought to identify selected beliefs regarding students' personal traits and expectations that distinguished first and non first-generation college students, and if there were any interaction effects with race/ethnicity. As for beliefs from Table 14, one finds that "Obtaining recognition from my colleagues for contributions to my special field" (*Goal0103*), "Change major field" (*Futact01*), "To gain a general education" (*Reason05*), and "Get a bachelor's degree" (*Futact11*) were the statistically significant selected beliefs (aspirations and expectations) variables that uniquely distinguished FGCS and NFGCS status. The variable "Gaining a general education" (*Reason05*) had significant interaction effects with race/ethnicity. As for "Gaining a general education" (*Reason05*), White and Black first-generation students more often endorsed this reason for getting a college education; however, Asian and Hispanic first-generation students were less likely to endorse this reason compared to non first-generation peers.

Many first-generation college students may find it difficult to earn a bachelor's degree. This may be due to the inadequate academic preparation many first-generation students receive prior to college, as well as a number of other personal and institutional issues. Surprisingly, the present study revealed that students who indicated they had a very good chance of earning a bachelor's degree (*Futact11*) were significantly more likely to be first-generation, regardless of race/ethnicity.

First-generation students in the present study also reported they were more likely not to change their major field of study (*Futact01*). This may be due to the fact that many first-generation students tend to be older; hence they come to college with a better understanding of what they wish to do with their lives. These students may be more committed and focused. Another potential explanation is that cost and time may also be considerable factors as to why first-generation students seldom change their major. For example, the high cost of a college education coupled with the demands on many first-generation students' time reinforces the notion of not changing majors. This finding supports a study conducted by Chaney et al. (1998) that found first-generation students were less likely to change the major field of study due to personal restrictions.

It was interesting that many first-generation college students in the respondent group were seeking to obtain recognition from colleagues for contributions to their special field of study (*Goal0103*). Results revealed that when compared to non first-generation students, those students who sought to obtain the recognition of colleagues for contributions to the field of special study were significantly more likely to be first-generation. This finding could be driven by the fact the many first-generation students may view seeking such recognition as validation from peers within higher education. This finding is interesting in that the students in the current sample appeared to have a greater appreciation for education than first-generation students in previous studies conducted by researchers such as Inman and Mayes (1999).

Common and Uncommon Variables

The results of the logistic regression revealed variables that were considered important to this study. Among them, 7 characteristics (*Hpw0111*, *Income*, *Act0114*, *Rate0103*, *Futact11*, *Futact01* and *Goal0103*) were commonly statistically significant student characteristics across

all race/ethnicity groups, and three (*Reason05*, *HSGPA* and *Act0110*) were unique to one or some of the groups. These variables can also be viewed as predictors that help identify the likelihood that a student is first-generation.

Seven Common Variables

In terms of income, I found that it was consistently lower for FGCS compared to NFGCS regardless of race/ethnicity. That is, this finding was consistent for Whites, Blacks, Hispanic and Asians students. The findings suggest the greater parent's income the less likely one is to be first-generation.

First-generation students were also less likely to ask a teacher for advice (*Act0114*). The fewer times a student sought a teacher's advice after class the less likely they were to be first-generation. This finding again, is consistent throughout the FGCS group regardless of race/ethnicity.

Overall, first-generation college students rated their computer skills (*Rate0103*) below average. When compared with non first-generation college students, first-generation college students computer skills were lower regardless of race/ethnicity. This finding was consistent for Whites, Blacks, Hispanic and Asians students.

Reading for pleasure (*Hpw0111*) was another variable that was common for all the groups. Surprisingly, the more students read the more likely they were to be first-generation, regardless of race/ethnicity. Getting a bachelor's degree (*Futact11*) was consistently higher for FGCS when compared to NFGCS, regardless of race/ethnicity.

Overall, first-generation college students were less likely to change their major field of study (*Futact01*). This finding was consistent for Whites, Blacks, Hispanics and Asian students. Interestingly, regardless of race/ethnicity, first-generation college students were more likely to

seek recognition from colleagues (*Goal0103*) regarding their academic areas than were non first-generation college students.

Three Uncommon Variables

Each of the following variables were considered uncommon to each group. They differentially discriminated FGCS and NFGCS status depending on the race/ethnicity of the group.

High school grade point average (*HSGPA*) was only statistically significant for Hispanic students. Interestingly, the higher Hispanic students' high school grade point average the more likely they were to be first-generation. High school grade point average was not significant for other groups.

For both White and Black students, gaining a general education (*Reason05*) was statistically significant. For White and Black students who endorsed the importance of gaining a general education, they were more likely to be first-generation college students. However, the direction of association was opposite for both Hispanic and Asian students. It is less likely that their purpose for going to college is to gain a general education.

Asian students also yielded another interesting finding. For felt overwhelmed (*Act0110*), the less overwhelmed, the more likely to be first-generation for Asian students.

Overall, this study paints a portrait of a subgroup of students who are entering America's colleges and universities in increasing numbers, and they can be expected to continue to grow over the next several decades both in numbers and as a proportion of the total undergraduate student population. First-generation college students differ in many educationally important ways from the students higher education has traditionally served. Because of these different characteristics and experiences, they are also a group at risk. These "new students" to higher

education often face unique challenges in their quest for a degree; conflicting obligations, false expectations, and lack of preparation or support are among the factors that may hinder their success. In addition, many first-generation college students require some form of remedial support. Because higher education has, traditionally, not provided remedial education, these students may continue to find obtaining a college education a quest unfulfilled (Altbach, 1993).

Relationship of Findings to Prior Research

The present study supports and provides new findings to previous research as it relates to identifying characteristics that predict the likelihood of being first-generation. Prior research has indicated that first-generation students are more likely to come from families with lower annual incomes (Inman & Mayes, 1999). Findings from this study support this conclusion. This is consistent with prior research.

Past researchers reported that Reading for Pleasure (*Hpw0111*) has been found to distinguish generation status (Terenzini et. al., 1995). Research conducted by Terenzini et. al (1995) indicated that first-generation students on average read less. In the present study; however, students who read more (*Hpw0111*) were more likely to be first-generation. In fact, first-generation respondents read more when compared to non first-generation students. The reason for this difference is currently unknown to me. One explanation might be that the university selected for my study had a large proportion of students of color, especially Hispanic students (see Table 3). However, this is only my speculation.

Previous research illustrates how first-generation students often do not interact with faculty and rarely ask for or seek their advice (*Act0110*). The present study supported the previous studies. Previous studies have also documented that first-generation college students

who spend less time interacting with faculty or seeking their advice are more likely to be at-risk academically (Terenzini et. al., 1995).

A study conducted by Fishman (1997), found that first-generation college students when compared to non first-generation college students had below average computer skills (*Rate0103*); hence distinguishing the two groups. The present study also found that computer skills distinguished first and non first-generation students. First-generation students when compared to non first-generation students were more likely to rate their computer skills below average.

The present study yielded a new interesting finding – “Gaining a general education” (*Reason05*). I was unable to identify previous research, which included this variable. First-generation students in the present study reported that their reason for attending college was to gain a general education. This was true more so for both White and Black students.

Wanting to earn a bachelor’s degree (*Futact11*) in the present study was a distinguishing factor between first and non first-generation status. First-generation students in the present study reported that they would very likely earn a bachelor’s degree. This contradicts previous research conducted by Inman and Mayes (1999), which found that first-generation college students felt they were less likely to earn a bachelor’s degree.

Results from the present study suggested that first-generation college students were less likely to change their major field of study (*Futact01*). This finding is consistent with previous research conducted by Chaney et al. (1998) that revealed first-generation college students were less likely to change their major field of study because in most cases, they were older, more focused and had stricter demands on their time.

Results from the present study indicated that obtaining recognition from colleagues for contribution to special field (*Goal103*) of study was statistically significant in distinguishing

between first and non first-generation students. This finding was interesting in that I was unable to identify previous studies or literature which included it as a variable to consider. Moreover, I am of the opinion that seeking such recognition could also be seen, by first-generation students, as a way to validate themselves in higher education.

Implications for Future Practice, Research and Policy

Findings from this study have several implications. Results point to specific actions that can be taken to help first-generation students be successful prior to entering college as well as once they have enrolled in college.

Early intervention has proven to be important and crucial in the success of first-generation college students. Students who attend institutions that understand their needs and have in place services and programs aimed at addressing those needs are more successful (York-Anderson & Bowman, 1991).

To begin, high school guidance counselors should work closely with first-generation students to not only help identify appropriate academic classes and remedial services while in high school, but to also make sound recommendations about which colleges are best suited for their needs. In addition, guidance counselors should consider the cost of a school they recommend when advising first-generation students. This is an important factor as many first-generation college students who come from lower income families overestimate the real cost of higher education (Gladieux & King, 1999). The failure of first-generation students to effectively assess the cost associated with higher education can lead to poor decision making and improper institutional fit.

In an effort to help address the academic preparation needs of some first-generation students, many colleges and high schools have developed partnerships that have allowed high

school students the opportunity to enroll in college courses on their campus while in high school. Such opportunities provide students a realistic experience of college academic life while earning college credits. For first-generation students, involvement in such programs could serve as a catalyst to help build self-confidence that may lead to them more frequently interacting with faculty and other higher education personnel. Other areas to focus on are faculty to student ratios, mentorship programs, and environments that are supportive, welcoming and nurturing. In a study conducted by Watson, Terrell and Wright (2002), students of color reported that smaller class sizes, which increased student-to-faculty interactions were more desirable. They also reported that institutional characteristics (i.e., campus size, the visibility of multicultural elements) helped to create an environment that they felt supported their needs and welcome their culture. Many historically Black colleges and universities, as well as liberal arts colleges have been successful in helping many first-generation college students succeed in higher education.

Student affairs professionals must seek every opportunity to promote and encourage inclusiveness within the campus community. They need to provide opportunities for first-generation students to be engaged in their education through clubs, organizations, advisory councils, etc. According to Whitt et. al (1999) this helps a student to feel connected to the university; hence, not only enhancing their experience in higher education, but also increasing student retention and graduation rates - areas many first-generation students are most at risk. The needs of these students (i.e. support programs, mentoring programs, scholarships, advising, etc.) must be addressed early and often; hence it is important to begin during freshman orientation.

In addition to the implications for practice, results from this study have implications for future research. The current study employed quantitative techniques to distinguish first-generation college students from non first-generation college students at an urban university.

Furthermore, the study sought to identify characteristics that predict the likelihood of being first-generation. However, future researchers may want to select a different type of institution (e.g., historically Black colleges and universities (HBCU), predominately White institutions (PWI), a single sex institution, a junior or community college). I would recommend using a larger dataset to increase the sample size, and using multiple universities in the sample to increase the diversity of higher education institutions. Future researchers may also want to employ qualitative techniques. This research method would provide university officials with a more in-depth understanding of this subgroup. These findings would further assist higher education professional's understanding of this growing group of students.

Results of this study also had implications for future policy. Implications are evident for policymakers at the institutional level in academic affairs as well as support services positions and financial aid offices.

In regard to policymakers in academic affairs, policies should provide frameworks for helping first-generation college students cope with issues regarding their transition to college and also collaborate with student affairs professionals to create an environment where first-generation students see the campus as welcoming, supportive, nurturing, and not hostile.

According to Richardson and Skinner (2000), Summer Transition Programs have proven to be successful in helping many first-generation college students with the transition to college. Such programs can also help first-generation students better understand the value of a college education. The most successful programs tend to be those that provide “systematic and comprehensive academic support services (such as assessment and remediation, learning laboratories, tutorial services, intrusive advising, and monitoring the students’ progress) until a student is firmly established in a major” (Richardson & Skinner, 2000, p. 39). Summer

Transition Programs can help lay a solid foundation in helping students build self-confidence so that they are more comfortable interacting with faculty, and navigating the system of higher education. Such programs can also assist students in developing their academic abilities; thus increasing both retention and graduation rates. However, such programs may be more effective if the curriculum stresses the importance of more overt forms of support. For instance, according to Justiz and Rendon (1989), such programs should encompass what they call “validating” experiences – encounters with administrators, faculty, and other students who send important signals to first-generation students that they are competent learners, that they can succeed, that they have a rightful place in the academic community, and that their background and past experiences are sources of knowledge and pride, not something to be devalued.

It is also possible to achieve these goals through First Year Experience (FYE) programs and mentoring. This is especially important for students of color. Many administrators and faculty members desire to achieve higher retention rates among undergraduate students. According to Watson et. al (2002) the mission or purpose of the FYE programs is to assist incoming students in making a successful transition to college, both academically and socially. By participating in such programs, students learn study and time management skills, discover how to use campus resources, increase interpersonal communications, and develop a sense of belonging to their institution’s community. In addition, FYE programs stress the importance of “Life Long Learning,” which may capture the interest of those first-generation students who like reading for pleasure. Therefore, university officials need to make certain these programs are designed by a collaborative team (i.e., faculty, student affairs and academic affairs officers), and are fundamentally grounded in student development, sociology and psychology theories.

According to Watson et. al., (2002) mentoring programs have proven to be successful in exposing first-generation college students to college and providing a welcoming environment. Mentors are likely to be sources of inspiration and act as coaches, professional friends, sponsors, facilitators, and in the case of many first-generation college students - role models. Mentors listen, motivate and provide constructive intervention at critical and key transitional points. This is essential since mentors (professors, staff, upper classmates, or administrators) have insider knowledge of the institution; hence they can help students navigate the system of higher education. Researchers have found that mentoring can have a major impact in students' academic performance regardless of race or ethnicity, to include helping them clearly identify which academic programs are best suited for them. Such programs can play key roles in the success of many first-generation students. Despite these proven benefits, many in higher education are still slow to adopt mentoring practices, which have prompted others to question how welcoming higher education is to certain groups. However, it should be noted that mentoring programs are not a "stand-alone" solution. Such programs should be coupled with on-going support and tutoring services (e.g., summer transition programs).

Policy makers overseeing financial aid may want to take note of the fact that first-generation students in this sample reported they work more than 20 hours per week. Knowing this will have an impact on first-generation students' academic performance, retention, graduation rates, etc., financial aid officers may want to consider developing a policy that would allocate grants and scholarships for first-generation students who demonstrate significant financial need. Moreover, policy makers might wish to consider tuition waivers that are linked to generational status based on need – some Ivy League and historically Black colleges and universities are currently doing so (Waston et. al 2002).

Findings from this study present several implications for future practice, research, and policy. However, this study was not without limitations.

Limitations of the Study

As with all research, this study was constrained by several limitations. The first limitation was external validity, (i.e., generalizability of results, because the restrictive nature of the sample). Since the sample cohort chosen for this study was students attending an urban comprehensive university, not strictly a random sample from the target population (i.e., students in colleges and universities in the U.S.) and the sample was disproportionately Hispanic, it is possible it could differ in some ways from students at other institutions and the results may not be generalizable to a population of college students in the U.S.

The second limitation of the study is the sample size. The current study's sample size was rather small (N=194). Therefore, it is possible that a larger sample size would yield different results.

The next limitation involves the method by which data were collected. Participants in the study volunteered; therefore, the sample was not randomly selected even within the chosen university. Due to the voluntary nature of the study, the results cannot be generalized even to the population of the freshmen students in the particular university under study, strictly speaking.

Fourth, participants were asked to fill out self-report questionnaire, a method of data collection that depends entirely on the participant being candid. Different types of data collection methods could reveal different findings.

The fifth limitation is the definition by which I assigned students to FGCS groups. I included only the parent's level of education, not that of other family members such as brothers,

sisters, uncles, aunts, cousins, and grandparents. If a broader definition was used that included the aforementioned family members the results might in some way differ.

Despite such limitations, the present study adds new knowledge on the study of first-generation college students, which is a relatively unexplored topic. Some theories from existing literature were confirmed by the present study, which reinforces our confidence for the theory. However, some findings of the current study showed the opposite direction of association from those in the literature, which certainly invokes the necessity of further study on this topic using different criteria. The study illuminates an under-studied group of students and provides higher education officials with additional research and information on first-generation students.

This study is unique in that the results revealed seven variables common to first-generation college students that cut across all racial and ethnic backgrounds (i.e., white, black, Hispanic and Asian). There were three additional variables that are common to some groups but not others. In light of these findings, the following are recommendations, although general in nature can serve as a foundation for colleges and universities to use in an effort to integrate this subgroup into the college community. However, because colleges and universities vary in size, mission, etc., university officials should use these recommendations as part of a framework in helping to develop more specifically detailed programs and services that are best suited for their respective institution.

Student Affairs administrators can make use of these findings to develop inclusive orientation programs designed to increase first-generation students' interaction with faculty and socialization into higher education. These programs must be in collaboration with faculty and others to create a campus environment that enhances student and faculty interaction as well as provide opportunities for first-generation students to feel connected. One means of fostering

interaction and socialization with university officials is through participation in small, highly individualized orientation classes with built-in opportunities for one-on-one contact in and out of the classroom.

Colleges and universities that make an honest effort to address the financial needs of its most needed students will witness a substantial increase in their completion of their first year. Because income is a significant factor for first-generation students, university officials can call on specific offices to address the needs of this student group. For example, student affairs administrators can work with directors of financial aid offices to develop need-base scholarships and matching grant programs for first-generation students. Beyond the campus, these findings provide useful information for colleges and universities to lobby state legislators for additional aid and financial support for this subgroup.

Furthermore, in an effort to help first-generation students deal with feeling overwhelmed, student affairs officials can work with directors of counseling centers to establish support groups, workshops and seminars on managing and coping with such feelings. In addition, mentoring programs have proven to be highly successful for high-risk undergraduate students such as students of color, women, low-income persons, the physically challenged, and first-generation college students (York-Anderson & Bowman, 1991). Mentoring programs have evolved to promote students' emotional, environmental, and academic acculturation in the college setting. Such programs create supportive environments where first-generation students can be affirmed by their peers.

University officials should look to revamp test placement during orientation to include sections that assess students' computer skills. Those students who test scores fall below the

university standard, would be required to enroll in a first-year experience program with a computer base component.

This study shows that first-generation students read more for pleasure than non first-generation students. Therefore, in an effort to help first-generation students feel connected to the campus, student affairs officials can work with directors of student life offices and directors of university libraries to establish student organizations and/or book clubs for first-generation students that center around pleasure reading.

It is not surprising that students who are successful during the first year of college are more likely to persist to graduation. Obtaining a college degree for most students may not be met with significant challenges; however, first-generation students may encounter multiple challenges. This study highlights a pre-college factor that may present such a challenge for first-generation students during their college experience (i.e., lower high school grade point averages). University officials can utilize this information to create specific academic early warning programs that help identify, within the first three weeks of class, students in academic distress and provide sufficient support.

Eventually, most colleges and universities in the United States will come face-to-face with the reality that our student population in higher education is continuing to change. These changes will impact the way university personnel teach, conduct research, develop programs, and deliver services. I am of the opinion that we, in higher education, need to do a better job of identifying and understanding this high-risk population. This group will encounter the normal developmental issues that all freshmen and transfer students face; however, their chances of successfully navigating through them without our support are slim. As educators we must never lose sight of the fact we have a basic ethic of care to all our students.

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Appendix B:

Graphs that represent the relationship Between Log Odds (Eta) and a Function of Probability

Figure 1 – Log-odds (η , Eta) as a function of Probability (P)

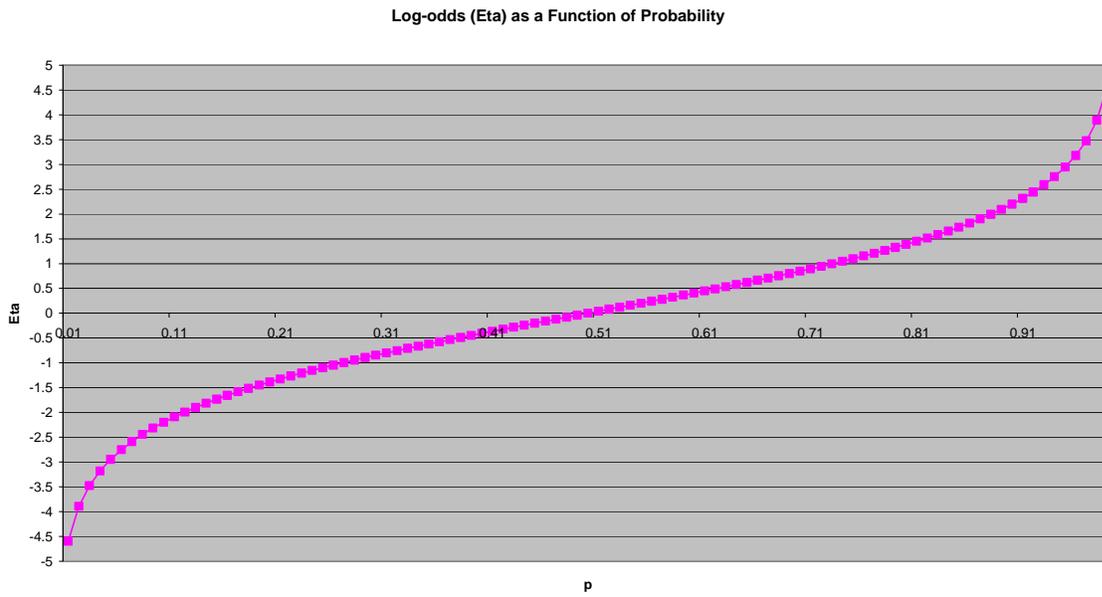


Figure 2 – Probability (P) as a function of log-odds (η , Eta)

