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Decoding minority student retention: An investigation of student experiences and institutional characteristics

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DECODING MINORITY STUDENT RETENTION: AN INVESTIGATION OF STUDENT EXPERIENCES AND INSTITUTIONAL CHARACTERISTICS

BY

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DEDICATION

This dissertation is dedicated to my family and friends who have offered me a lifetime of love and support. I thank you all.

To my mother: "I love you and I expect you to do well." You said this to me every day as you dropped me off at school- it is now my personal mantra. Words cannot even begin to express my gratitude for everything you have done (everything you have sacrificed) for me over the years. When I was a kid, you made my education a priority and you taught me that I can do and that I can be anything. As I got older you encouraged me, you prayed for me, and you gathered the angels to watch over me. Thank you.

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TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

FIGURE PAGE

LIST OF EQUATIONS

ABSTRACT

DECODING MINORITY STUDENT RETENTION: AN INVESTIGATION OF STUDENT EXPERIENCES AND INSTITUTIONAL CHARACTERISTICS

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This study seeks to explain factors that contribute to the retention of black and Hispanic students from their first year through graduation at colleges and universities in the United States. Other studies have investigated the experiences of minority college students (Massey et. al 2006, Steele 1999, and Bowen and Bok 1998) and have focused primarily on student experiences. Using Bourdieu's (1973) conceptualization of capital as the theoretical backdrop, this study is a preliminary investigation of how student experiences and institutional characteristics influence college student graduation.

The study uses data from both the National Longitudinal Survey of Freshmen and the 2008 Integrated Postsecondary Data Survey to investigate four hypotheses:

H_1: There is an association between student experiences and degree completion status.

H_2: *The association between student experiences and degree completion* status is moderated by race/ethnicity.

H_3: Institutional characteristics (reflections of students' academic preparation, programs to support students' commitment to educational goals, opportunities for social and academic integration, racial composition of campus, and financial characteristics of the institution) are associated with an institution's graduation rate.

H_4: The effects of institutional characteristics on college graduation rates are moderated by race/ethnicity.

Analyses of the NLSF data found limited support for Hypothesis 1 but suggest that a student's pre-college experiences have a consistent impact on his or her college graduation status. No support is found for Hypothesis 2. The IPEDS data allows for a preliminary investigation of Hypothesis 3 and Hypothesis 4 and finds some support for both hypotheses. However, some of the institutional characteristics (institutional resources such as Remedial, Distance Learning, or Weekend Classes, or Employment Services) are surprisingly associated with lower graduation rates. When most of these resources are combined with the effect of the percentage of low-income students, the negative effects are reduced somewhat but not eliminated. The analysis for Hypothesis 4 shows that there are many differences in the impact of institutional characteristics on each racial/ethnic group's graduation rate. Although my findings allow the rejection the null hypotheses that there is no relationship between institutional characteristics and graduation rates, it should be noted that the hypotheses cannot be fully tested without more data on student body characteristics. This study suggests that future research on the role of the institution needs to include these student body characteristics.

INTRODUCTION

American colleges and university campuses are experiencing an expansion of racial and ethnic diversity that mirrors the demographic changes in the rest of the country. According to the 2010 U.S. Census, racial and ethnic minorities make up nearly one-third of the total United States population and by 2050 minorities are expected to make up more than half of the total population (US. Census 2010). These demographic trends are also present within the academy; the number of ethnic minorities enrolled at colleges and universities increased 50%, from 2.5 million in 1995 to 5 million in 2006 (Cook and Codova 2006).

Even though the enrollments at colleges and universities have diversified, some problems concerning the retention of minority students persist. Less than half of black or Hispanic students graduate from college within six years, compared to nearly 60% of white students (Almanac of Higher Education 2008). The social impact of these low graduation rates is in the wage disparity between those with a college degree and those without a college degree. According to a 2007 College Board Report, a person with a bachelor's degree can earn over 60% more in his or her lifetime compared to someone without a degree (Education Pays 2007). While the reasons that a student may choose to leave college can vary greatly by his or her

preparation for college (Massey *et. al* 2006), social or academic integration (Tinto 1975), distractions from home (Charles *et. al* 2009), or performance at college (Bowen *et. al* 2009), the possession of capital (or "know-how") is essential for academic success.

The purpose of this study is to examine the impact of student experiences and institutional characteristics on college graduation. I argue that students with high levels of capital for college have experiences in college that make them more likely to graduate than students with low levels of capital for college. Furthermore, I contend that some institutional characteristics can enhance student experiences and increase the college graduation rates for minority students. The primary sources of data for this study are the National Longitudinal Survey of Freshmen (NLSF) and the Integrated Postsecondary Education Data System (IPEDS).

Structure of Chapters

In order to explore strategies for college graduation, this study utilizes sociology, education, and psychology literatures. These literatures are reviewed in Chapter 1. Theoretical and empirical models are developed to investigate the role of student experiences and institutional characteristics on college graduation. In Chapter 2, I explain the dataset, variables, and methodology that I use to test each hypothesis. Chapter 3 investigates the role of student experiences on college graduation status. Chapter 4 explores the role of

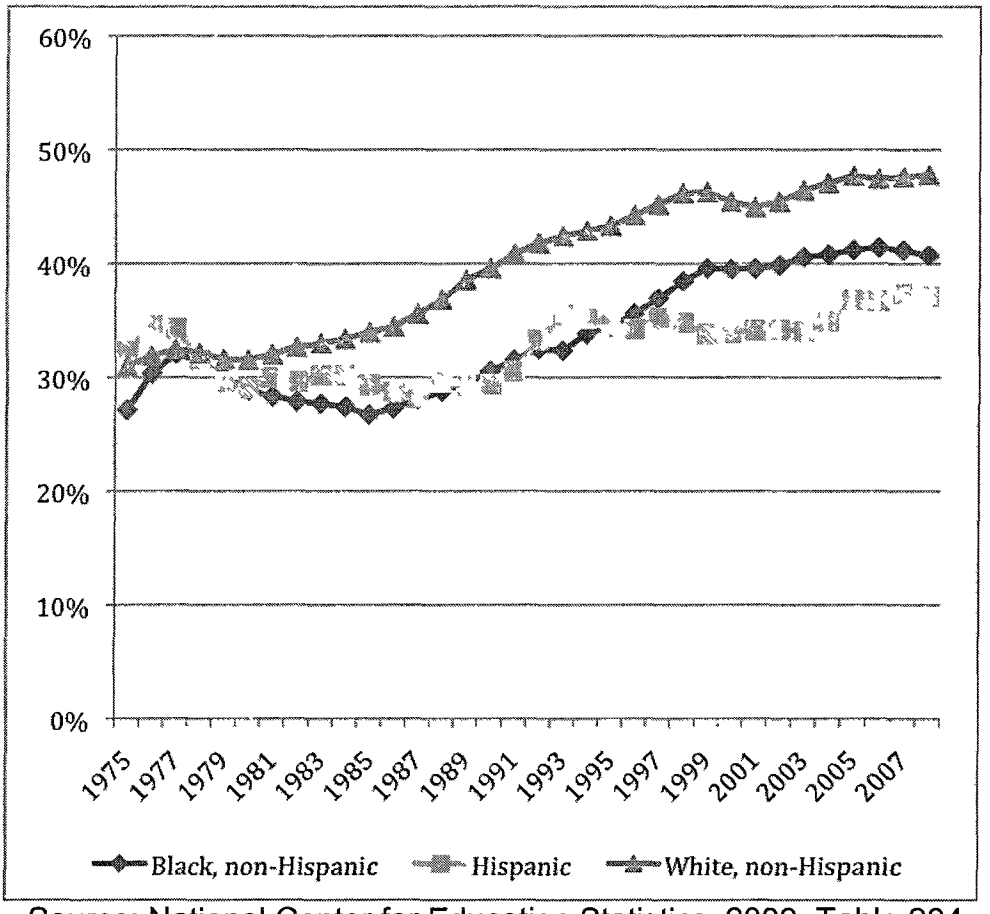
institutional characteristics on black, Hispanic, and white and Asian student graduation rates. A synthesis of results, implications and concluding remarks is provided in Chapter 5.

CHAPTER 1

GUIDING THE RESEARCH: AN OVERVIEW OF EDUCATIONAL ATTAINMENT AND CAPITAL

For the past thirty years, the number of students entering colleges and universities has been steadily increasing. In 1975 only 31% of white high school graduates between eighteen and twenty-four years old were enrolled in college; by 2008, the number had jumped to 48% (Figure 1.1)

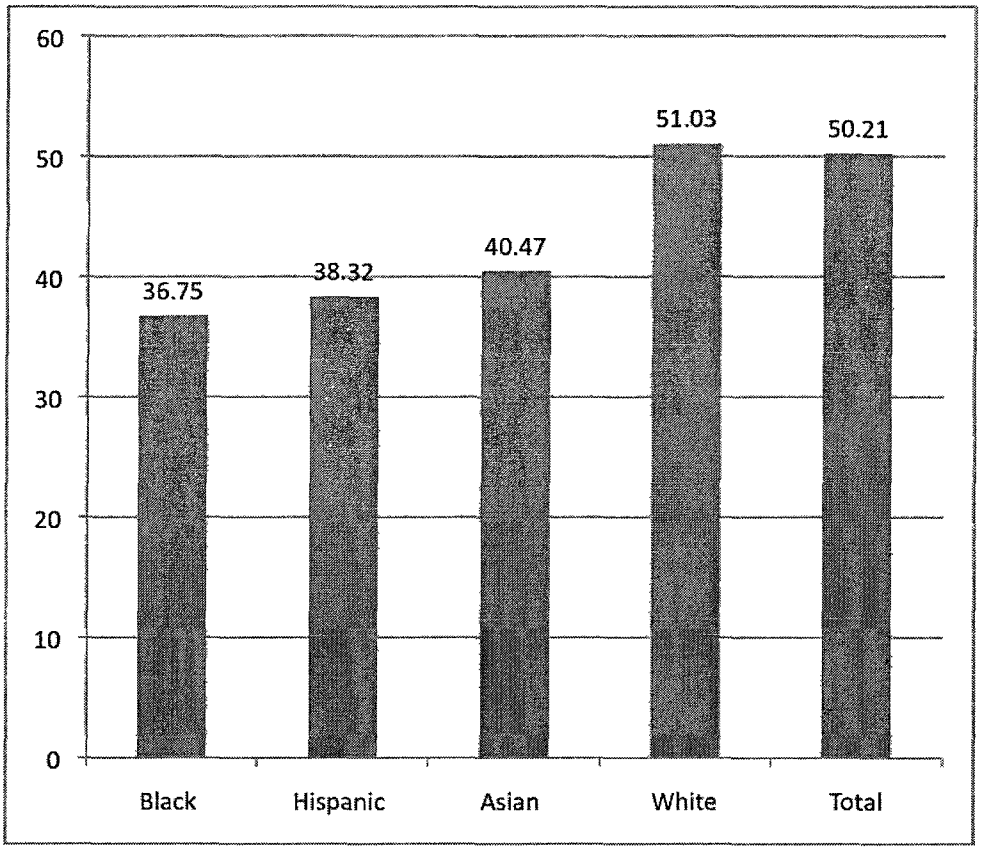
Figure 1.1: Postsecondary Enrollment Rates of All High School Graduates Ages 18 to 24, by Race/Ethnicity, 1975–2008



Source: National Center for Education Statistics, 2009, Table 204

The increase of black and Hispanic students enrolling at colleges and universities has been particularly marked. Between 1980 and 2008, black and Hispanic high school graduates' college enrollment increased by 12% and 8%, respectively (NC.ES 2009). Although college enrollment is steadily increasing, college completion is markedly low. According to the 2009 Integrated Postsecondary Education Data Survey, just over half of students who begin college graduate within six years. Less than 40% of black and Hispanic students graduate from college (Figure 1.2).

Figure 1.2: College Graduation Rate by Race



Source: Integrated Postsecondary Education Data Survey 2008

It is important to address the graduation gap between white and minority students for three primary reasons. First, many people perceive education to be a social equalizer. The often-quoted congressman Horace Mann said, "Education then, beyond all other devices of human origin, is the great equalizer of the conditions of men, the balance-wheel of the social machinery" (Mann 1848). If colleges and universities actually have the power to reduce social inequality, then the institutions themselves need to be actively promoting equality. Vast racial disparities in graduation rates necessarily perpetuate racial disparities in other social life, primarily income and wealth distribution. Second, educational attainment is closely linked to income. In 2005, median full-time earnings for bachelor's degree holders between the ages of 25 and 34 were more than $21,000 higher than the median earnings of high school graduates working full time (NCES 2010). A long history of racial discrimination in the United States has created a gap in income between minorities and whites. Without closing the educational attainment gap, the income gap will continue to grow. Third, a diverse group of graduates exemplifies institutions' missions of providing students a multicultural, global education. Many institutions have the explicit goal of promoting diversity in their mission statements. A racially balanced graduation rate suggests that the school is (to some degree) achieving their mission.

There are many theories that attempt to explain low college graduation rates, but most researchers have only agreed that the issue is contextual.

Students choose to leave an institution for a variety of reasons: social, academic, financial, etc. However, the marked disparities between the minority student graduation rate and the white student graduation rate are troubling. This study investigates how students' in-college experiences impact their likelihood of graduating and the role of institutional characteristics and resources in college graduation. Two research questions guide this study:

1) Which kinds of students' in-college experiences are associated with higher graduation rates for black and Hispanic students?

Student attachment to their institution is closely related to both retention and graduation rates. Their attachment is, in part, dependent on their fit with the institution. Are students involved in organizations and activities, do they feel respected by faculty, staff and other students, and do they feel that they are perceived as making a valuable contribution to the institution? Do these experiences and perceptions affect their college completion?

2) Which kinds of institutional characteristics are associated with higher graduation rates for black and Hispanic students?

Disparities in income, unequal primary and secondary educational opportunities due to racial residential segregation, and first-generation status all contribute to many minority students entering college with drastically different backgrounds than their white peers. While institutions have little control over students' pre-college experiences, they can try to level the opportunities when minority students come to their campuses. In this study, I explore which school

initiatives, programs, resources, and characteristics contribute to minority student retention.

History of a Racial Inequality in Education

The racial disparities in educational attainment may be reflective of the United States' more than 100-year history with legal racial segregation. Quadagno (1994) explains that race continued to play a significant role in society long after slavery was abolished because it established a social hierarchy. In 1896, the Supreme Court ruled that it was constitutional for blacks and whites to have separate public spaces as long as the facilities were equal. Thus, *Plessy v. Ferguson* established the "separate but equal" clause and legal segregation for nearly seven decades (United States Supreme Court 1896). It was not until the 1954 *Brown v. Board of Education of Topeka, Kansas* Supreme Court case that "separate but equal" was overruled. The Court decided that it was impossible to maintain equal facilities for black and white students and that public schools must be integrated. The Court's opinion stated, "We conclude that in the field of public education, the doctrine of 'separate but equal' has no place. Separate educational facilities are inherently unequal" (United States Supreme Court 1954). Although this decision marked the official beginning of school desegregation, some school districts strongly resisted and used the decision's "all deliberate speed" clause to justify delaying integration (Quadagno 1994:25). For example, integration of Central High School in Little Rock, Arkansas took intervention by President Eisenhower and the National Guard; the Louisiana governor threatened to close schools in New Orleans rather than integrate them;

and Prince Edward County, Virginia closed their schools for five years to stop integration (Caldas and Bankston 2005: 29).

While there were large-scale protests against school integration in the South, big cities in the North were facing more covert barriers to integration. Massey and Denton (1993) discuss residential segregation and its impact on social services, including public schools, in the United States. In the 1930s, government programs such as the Home Owners' Loan Cooperation introduced "residential security maps" which prohibited blacks from acquiring housing loans and segregated them to the inner cities (Massey and Denton 1993: 51). On the maps, neighborhoods were color-coded to distinguish low-risk loans from high-risk loans; most black neighborhoods were coded as high-risk. As a result, blacks encountered much difficulty acquiring loans and financing homes. The Federal Aid Highway Act of 1956 appropriated money to build interstate highways and more than 41,000 miles of roads, allowing whites to move out of the cities and into the suburbs (Public Law 84-627). These policies were particularly damaging for inner-city public schools. Schools are primarily funded by property taxes and when the middle-class base of whites left the cities, so did much of the funding for the schools (Massey and Denton 1993; Caldas and Bankston 2005, Kozol 2005). The policies also had negative implications for the accumulation of black wealth (Conley 1999). The concentration of low-income blacks in the cities lowered property values and made selling one's home or moving nearly impossible (Conley 1999, 143). Real-estate agents also used techniques such as 'blockbusting' to preserve the racial purity of neighborhoods

by encouraging white families to sell their homes in fear of black neighbors and then reselling the homes at increased prices to black families (Massey and Denton 1993: 37). Many blacks in the inner cities were left with underfunded schools and few opportunities to accumulate enough wealth to move their children out of the failing schools.

One decade after the Court's decision, it was apparent that although *Brown* had granted blacks equal access to education under the law, interpretation varied significantly throughout the United States. Most public spaces in the South continued to be deeply segregated (Quadagno 1996). One hundred Southern congressmen signed the 1965 *Southern Manifesto* that pledged to resist *Brown* and keep segregated schools (National Historic Landmarks Program 2000). This resulted in the institution of more stringent laws that forced desegregation. The Elementary and Secondary Education Act of 1965 (ESEA) first held schools responsible for desegregating by threatening the loss of federal funding (Public Law No. 89-10 1965). Soon after, the 1968 *Green v. County Board of Regents of New Kent County* forced schools to desegregate and instituted standards of racial balance. Schools were forced to desegregate their classrooms or risk losing federal funding. Caldas and Bankston (2005) discussed the effects of busing students in the Boston school district. When the Boston district was found guilty of *de jure* segregation in 1974, the court ordered the school district to begin moving black children from the predominately black northern suburbs to the southern suburbs and white children from the predominately white southern suburbs to the northern suburbs (Caldas

and Bankston 2005: 34). The court-mandated busing encouraged white flight from the city and subsequently, the number of white children in Boston Public Schools steadily decreased over the next twenty-five years (Caldas and Bankston 2005).

After the segregation era, blacks continued to be socially disadvantaged. White flight from major inner cities decreased employment opportunities, city funding of social services and public education. The decreased funding for inner city schools significantly limited the educational achievement and opportunities of their students. Kozol (1991) used case studies to describe institutional inequalities in America's public schools. The custom of using property tax to determine school funding systematically keeps schools in poor neighborhoods (usually filled with students of color) under-funded. Kozol (2005) identified the schools themselves as major contributors to student underperformance. He wrote that many inner-city, low-income students have difficulty learning because there are too many distractions within their schools. Metal detectors created an unwelcoming learning environment. Broken windows, doors, and desks made the classroom environment uncomfortable. Badly tattered and out-of-date textbooks decreased both student and teacher morale. Additionally, overcrowded classrooms encouraged inexperienced teachers to relate to their students more like prisoners than learners. Kozol (2005) found that students at some poor schools spend up to 25% of the academic year either taking or preparing to take standardized tests. He argued that not as much in-school learning goes on in these low-income schools as in schools that are not

dependent on test scores to qualify for extra federal aid. Kozol's research illuminated some of the institutional barriers to student success. His research suggested that students from poor schools are systematically receiving less support and encouragement from teachers, administrators, counselors, and other staff than their peers at wealthier schools.

The Role of Capital in Education

For a long time, scholars have asserted that capital plays a major role in the disparities in educational attainment among some social groups. Capital is the sum of an individual's resources and the ability of those individuals to use their resources (Bourdieu 1986). Dika and Singh (2002, 34) described capital as "(positive) social control where trust, information channels, and norms are characteristics of the community. Although academic achievement, social integration, and financial security are all important contributors to predicting whether or not a student will stay at an institution, capital underlies each of the explanations for student retention. This study uses student's pre-college experiences as proxies for capital to explore how closely related types of capital (financial capital, social capital, cultural capital) influence the kinds of experiences that students have in college.

Before explaining how prior research has linked these forms of capital to education, it is important to offer some definitions. Financial capital may be the most easily recognized form of capital that a student brings to college. It is a sum of the financial resources within a household including, "income, assets, and

various monetary instruments" (Massey et. al 2003, p 5). Although financial capital may be the simplest form of capital, it directly affects the experiences that a student may have in college. For example, wealthy students have higher retention rates and graduation rates compared to low-income students (Bowen et. al 2009). In part, this could be due to the lack of stress over not being able to pay for school or even a latent understanding that their families are a financial safety net (Conley 1999).

Students also bring social capital to college. This type of capital describes the complex system of networks in social relationships and an individual's access to those networks. Parents transmit social capital to their children by forming social ties with members of their neighborhood, work, or church communities and by encouraging their children to mimic those social ties with the children of other community members (Coleman 1988). Through these social ties, both parents and children gain information on how to use resources to advance their lives (Ream 2003). Students who come to college with high levels of social capital may have an easier time integrating than students who do not have high social capital. A cousin who is an alum of the school, an upperclassman from a student's hometown, or even a mother who was in a sorority at the school can all smooth the transition to college. Students without these pre-made connections have very different experiences in their first few days on campus as they grapple to build a social network.

Cultural capital, first introduced in Bourdieu's (1973) essay "Cultural Reproduction and Social Reproduction," refers to the norms, tastes, behaviors,

habits, and preferences of the members of a particular social group. Cultural capital is transmitted from one generation to another by including children in educational activities and encouraging them to explore diverse cultures. These activities provide opportunities for children to learn the habits and lifestyles of their social class. Students with high levels of cultural capital for college have a good idea of what to expect in the classroom, dorms, and campus spaces before they arrive at their institutions.

Some scholars have advocated capital deficiency theory as an explanation of minority college student underachievement. The theory argued that students who do not achieve high levels of education lack the capital to be successful. The students most likely to lack capital are from the most marginalized social groups; racial minorities, lower classes, first-generation, etc. Although scholars who accept the capital deficiency theory hypothesis all identity capital as a key component to success, the *kind* of capital that they think is most important differs.

Financial Capital. Some researchers have pointed to the lack of financial capital as a reason for the low academic performance and educational attainment for some low-income students. The impact of financial capital on educational attainment begins long before a student enters college. For example, success on standardized tests to get admitted to college such as the SAT and ACT is often associated with pricey classes or preparation books on how to take the test. According to Princeton Review, one of the premiere test preparation

companies, Americans spend more than $250 million each year on test preparation classes and books. With some classes costing more than $700 per six-week session, standardized test preparation is prohibitive for many low-income families (JBHE Foundation, 2000) and these students are not getting an equal opportunity to express their aptitude to college admissions staff. Once students begin college, financial capital may determine whether or not students are concerned about purchasing books for the semester, if a student decides to join a student organization that has a participation fee, or even whether or not a student decides to live on campus. Financial capital underlies nearly all student experiences in college and is highlighted in the literature as an important predictor of student retention.

Social Capital. Bourdieu's original concept of social capital was partially extended by Coleman (1988) in the article, "Social Capital in the Creation of Human Capital." Coleman examined three forms of social capital: obligations and expectations, information channels and social norms. He used the lack of social capital to explain why some sophomore high school students choose to drop out of school rather than persist through graduation. Well-connected parents seek information from their networks about how to advance their children's lives (Ream 2003). Parents who are college educated have a clear understanding of higher education and are able to promote the benefits of college enrollment to their children. Additionally, parents who model networking behaviors for their pre-college children seem more likely to have children who use strong social ties to enhance their college experiences.

Cultural Capital. Berger (2000) applied Bourdieu's cultural capital to the student attrition process. Berger argued that social reproduction is visible at both the individual and the institutional level. Colleges and universities reflect cultural capital that manifests in its selectivity in the admissions process and perceived success of graduates (Braxton and Hirschy 2005). Berger offered four propositions that test for congruence or mismatch between a student's cultural capital and the level of cultural capital at a particular college or university (Braxton and Hirschy 2005). First, institutions with higher levels of cultural capital will also have higher graduation rates. Second, students with higher levels of cultural capital are more likely to persist through graduation at all types of institutions. Third, students with higher levels of cultural capital are most likely to persist at institutions that also have higher levels of cultural capital. Fourth, students with lower levels of cultural capital are most likely to persist at institution that also have lower levels of cultural capital (Berger 113-116).

In *Reproduction in Education, Society, and Culture* (1977), Bourdieu and Passeron argued that the education system both reflects and reproduces social stratification. The authors argued that schools reproduce elite values (in the United States, upper-middle class, white) and that the children of the elite are better socialized to understand these values. Bourdieu and Passeron's research is easily extended to post-secondary education. Students who come to college with high levels of capital have different experiences in college than students who come to college with low levels of capital. However, where Bourdieu and

Passeron seem to argue that capital itself is responsible for disparities in educational attainment, I contend that the experiences students have in college are more important than the capital that they bring to college.

Capital provides the best theoretical framework for this study because it explains how students' pre-college characteristics influence their in-college experiences and performance. All students come to college with financial, social, and cultural capital from their social class and the expectation of gaining knowledge and skills (human capital) from their institution. Although students may begin college expecting equal outcomes in human capital, their initial levels of capital and their subsequent college experiences vary. The ladder metaphor, often used to explain minority-white financial capital differences, is equally useful in explaining the cultural capital in education gap between whites and some minority groups. More students of color than ever before begin climbing the ladder toward a college degree, but black and Hispanic students are more likely to have low levels of capital for college and may begin on a lower ladder rung than their white and Asian peers. Without something to bridge the capital gap within the first few semesters of college, these students' eventual educational attainment becomes more reflective of their initial starting position on the ladder rather than their academic potential. This study highlights the bridging opportunities from initial capital to student experiences that are critical to college student retention.

Minority students are much less likely to get financial, social, or cultural capital from their parents. Bourdieu argues that the structural constraints of

cultural reproduction make it virtually impossible for a student to get more capital from school; schools are institutions designed to maintain stratification and protect the elite social class (Bourdieu 1986). This study uses pre-college characteristics to test Bourdieu's thesis on the relationship between capital and education. Although I do not use any direct measures of capital in the analysis, I include capital at the conceptual level to justify the pre-college characteristics variables that I do include in the analysis. Can the experiences that minority students have in college provide them enough capital to influence their graduation status? Can institutions provide capital bridging experiences that influence the graduation rates for minority student groups?

Capital is the underlying theory in much of the literature on student graduation. Capital is rarely stated explicitly, but is often described in discussions of integration, commitment, or financial security. The literature reviewed in this study points out where capital has been used in the student retention literature and why capital should be used to frame this study. The next section will discuss how research on traditional models of student retention has identified some of the areas in which students' varying levels of capital may lead to disparities in their overall attainment. I will first describe some of the general models and then explain the non-traditional, more specialized models for minority students.

Traditional Models of Student Retention

Early research on student retention is both generalized and theoretical. Scholars equated students choosing to leave school with people choosing to leave society; Durkheim's (1961) explanation of why people commit suicide was the guiding theory for these early studies of student retention. The theoretical discussions led to testable models. These traditional models of student retention did not intentionally take into account sub-groups of students and as a result their subjects were generally white, male, and middle-class. Additionally, these early models did not explicitly identify capital in their explanations of retention, despite social and cultural capital being natural predictors of a student's integration.

Tinto's model of student departure has had the greatest influence on the student retention literature. The model showed how students enter college with a full biography, skills, and expectations. Additionally, students enter college with an expectation to finish college and to stay at their institution. TInto posited that students' pre-college background and their in-class social system lead to their academic and social integration. In this model, the degree to which students are integrated determines whether or not they decide to stay in college. In 1993, Tinto expanded this model to include commitments outside of the institution and intentions to remain enrolled in the institution.

Tinto explained his model using WIlliam Spady's (1971) research on students dropping out of school. Spady analogized committing suicide and dropping out of school because in either case a person leaves a social system. In *Suicide*, French sociologist Emile Durkheim (1961) argued that people

committed suicide when they lacked the same values as others in their community and when they felt unsupported by their community. Tinto borrowed Spady's use of Durkheim's criteria to identify his key concept of academic and social integration. Tinto found lack of academic integration akin to a student not sharing academic values and lack of social integration akin to a student not developing meaningful relationships with friends, faculty, or staff at school.

Tinto's later model (1993) offered negotiating "rites of passage" as another explanation for student departure. Although similar in structure to his earlier model, in this one Tinto argues that students are more likely to persist when they separate themselves from their family and high school friends, align their values with the values of college family and faculty, and commit themselves to pursuing those values and behaviors.

The second major theory on college student retention came from John Bean (Bean 1990, Bean and Eaton 2000). Originally, based on a model of employee turnover in work organizations, Bean contended that any given behavior (retention) is linked to similar past behavior, normative values, attitudes, and intentions. Bean's model described how traditional age students' backgrounds influence the way the student interacts with his or her college. High school experience, family support, and educational goals all begin to influence students upon matriculation. Bean argued that the student interacts with institutional members and organizational members at school while simultaneously being influenced by environmental factors such as missing home or running out of money. Both the institutional influences and the environmental

influences play a large role in determining a student's intentions to remain enrolled at a school and ultimately, graduation.

Although structurally similar, this model differed from Tinto's original model in three distinct ways. First, it was based on psychological processes while Tinto's model was firmly rooted in social processes. Second, Bean included factors outside of college that may also impact retention. Third, Bean's model included students' intentions (intentions were found to be the best predictors of student retention). Tinto incorporated some of Bean's research in his own 1993 model.

As the 1990s approached, student retention research began recognizing the growing heterogeneity of college students. Bean and Metzner (1985) developed a model of retention for non-traditional students. This model took into account that older, working, or commuting students have less interaction with students, faculty, or staff on campus and their retention may not be as influenced by social integration. Other models that recognized the rising cost of college attempted to reduce complex, theoretical discussions to neat, "how-to" guides for students. Later models also began to include capital as framework for understanding student retention. Students who both possess capital and are savvy enough to use their capital are more likely to graduate from college. Capital began to play a larger role as these models became highly individualized to specific dimensions of retention and covered a range of subjects including: campus culture, learning choice, psychological processes, power, and

race/ethnic differences. This study also attempts to contribute a "micro" retention theory where race /ethnic difference and the role of the institution are at the core.

Non-Traditional Models of Student Retention

Non-traditional models of student retention are derived from the traditional models, but place a greater emphasis on sub-groups of students. For example, while Tinto's traditional models may have argued that integration is an important contributor to student retention, Fischer's (2007) non-traditional model argued that integration's contribution differs by a student's race/ethnicity or first-generational status. The non-traditional models are also more likely to focus on a particular dimension of student retention rather than the grand models that offer a comprehensive explanation. This study fits best within the non-traditional model framework because it highlights differences in college graduation between blacks, Hispanics, and whites and Asians.

Academic and Social Preparedness

Academic and social preparation for college was first identified as one of the pre-college factors in Bean's model for student retention. Newer models have examined this aspect of student retention in with particular respect to minorities and first-generation students (Allen *et. al* 2007). High school grade point average, standardized test scores, advanced placement exams, and the quality of the student's high school

curriculum have all be used as measures academic preparedness. Allen, Robbins, Casillas, and Oh (2008) found that a higher percentage of minority

students than white students had not taken college preparatory or advanced placement classes in high school that would prepare them for college coursework. Minority students were also less likely to have attended college preparatory high schools and as a result, they do not have skills or a knowledge base comparable to their peers who received some kind of formal college preparation. However, the lack of participation in college preparatory classes was not totally unique to minority students. A 2003 report by the Association of American Colleges and Universities revealed that less than half of high school graduates complete college preparation curricula before coming to college, forty percent of students at four year colleges require at least one remedial course, and the more remedial coursework a student needs the less likely he or she is to graduate (Association of American Colleges and Universities 2002). Academic preparedness has been assessed in terms of the overall quality of a student's high school. High schools with low student-teacher ratios, a foreign language requirement, or a computer lab all help prepare students to succeed in college. While many minority students come from low-income schools that may not have prepared them for college, the majority of white students are from middle-class families. (Massey *et. al* 2006) When minority students both never took a college preparatory class and attended a mediocre high school (often related characteristics), they are doubly disadvantaged in college.

There is some evidence that middle-class black and Hispanic students may face a different set of obstacles than their lower-class peers and their underpreparation may be social and not academic in nature. Cultural capital for

college describes students' aptitude for navigating dorms, classrooms, dining halls, and other spaces on campus. Even students who seem prepared for college level courses may not be socially prepared for college. In *The Source of the River*, Massey, Charles, Lundy, and Fischer (2006) developed the National Longitudinal Survey of Freshmen to investigate the demographic backgrounds, pre-college experiences, and in-college experiences of black, Hispanic, Asian, and white undergraduates at twenty-eight selective four-year institutions in the United States. The authors found that most white students come from middle-class families, live in predominately white neighborhoods, and attended predominately white high schools. In contrast, the income distribution of Black and Hispanic college students is bimodal- some are low-income (most likely to be underprepared) and others are middle-class (with pre-college experiences more similar to whites). However, all black and Hispanic students (lower and middle class) were more likely to live in minority-segregated neighborhoods and attend segregated schools. The authors posited that middle-class black and Hispanic students may come to college academically prepared but socially underprepared for negative perceptions or stereotypes about their race or ethnicity's ability to do college work. Stereotype threat, a term coined by Steele and Anronsen (1995) occurs when students feel that their personal failures will confirm negative stereotypes about their group. As a result, they disassociate with the entity (school) that is causing the anxiety. Massey *et. al* (2006) suggested that minority students who are entering predominately white educational environments for the first time are particularly prone to stereotype threat. Thus, minority students who

are concerned with whites' opinions of their racial group are more likely to disassociate with the institution, do poorly in classes, and/or drop out of the school. Massey *et. al* (2006) found that 1) black and Hispanic students who said that they were both extremely self-conscious of instructors' perceptions of them and who did not think that they were very good students and 2) black and Hispanic students who both reported their primary identity as American and gave their own group a high ranking on the unintelligibility scale were the most likely to be affected by stereotype threat (Massey *et. al* 2006). Stereotype threat uniquely affects minority students and creates a false sense of underpreparedness among minority students.

First-generation college students, defined as those who did not have at least one parent graduate from college, may face a unique set of challenges to their academic and social preparation for college. Ishitani (2006) found that first-generation students are 51% less likely to graduate in four years and 32% less likely to graduate in five years then their peers who have at least one parent who attended college. The lower rates of first-generation students could be, in part, reflective of their limited social and cultural capital in higher education. In order to do well in school, a student needs enough cultural capital to know what is expected and what to expect (Bourdieu, Passeron, and Nice 1990). For example, college students with a parent or sibling who already attended college are equipped with better resources to be successful in college because their families can give them advice and guidance (Pascarella *et. al* 2004). Bourdieu argued that participation in post-secondary education does increase social

capital, but many first-generation students lack the cultural capital to be able to fully participate (Bourdieu, Passeron, and Nice 1990). Good study skills, knowing how to advocate for oneself, being aware of and comfortable with using institutional resources are all components of cultural capital that are both critical to educational success and that can be passed down through the family (Massey *et. al* 2006: 6). If parents have never been to college, they may not know how to advise their children to be successful in college. The "cultural capital deficit" argument is often cited as a reason for minority students' low educational attainment (Massey *et. al* 2006). Weiss *et. al* (2003) and Coleman (1966) found a positive relationship between parents' income and education and their children's educational attainment. Black and Hispanic students are much more likely to be first-generation students and are more likely to lack the cultural capital that will help them succeed in college.

I expect that blacks and Hispanic students are more likely to come to college academically and socially underprepared because they are more likely to attend high schools that did not prepare them well for college. Consequently, I expect that black and Hispanic students will benefit more from institutional support for academics than white students. Documented differences in pre-college experiences suggest that blacks and Hispanics have lower social and academic preparation than their white peers and that these differences may manifest, in part, in their respective graduation rates.

Social and Academic Integration

Tinto (1975) first introduced social and academic integration as a concept central to student retention and it has remained an integral part of nearly all research on college completion. While scholars agree that some form of integration is an important component to the student retention model, research has shown that the kind and degree of integration may vary for different sub-groups of students.

Fischer (2007) measured student's social integration by the number of activities in which they were involved. She found that black and Hispanic students reported greater attachment to their institution when they are involved in both "formal activities" (clubs, organizations, etc.) *and* "informal activities" (peer relationships). Fischer also found that minority students' involvement in formal organizations significantly increased their institutional attachment, but that involvement in formal organizations was less influential to white students' attachment. Fischer concluded that minority student retention, in part, depends on schools having ample opportunities for students of color to get involved.

Social opportunities are often limited for students of color at predominately white institutions. Many come from minority-segregated schools and experience interracial education for the first time when they begin college (Massey *et al.* 2006). Similarly, many white students also have their first interracial education experiences at college. Everyone's lack of experience with races different from their own may lead to awkward conversations, feelings of exclusion, and anxiety (Locks *et. al* 2008). Despite some advances in racial diversity, most college

campuses are predominately white and look more similar to white students' high schools than black and Hispanic students' high schools. Social opportunities for students of color are vital for creating a safe space for students and connecting them to their campus.

These social opportunities for students are critical components to their social capital building abilities. Granovetter (1973) wrote about the significance of acquaintances within an individual's social networks. Unlike close friends, with whom a student likely shares a social network, acquaintances have a different set of social networks from which a student can borrow. For example, if a student attends a party and engages in small talk with people outside of her usual social group, she increases her social capital and her social network grows to include both her new acquaintances and their social networks. This dimension of integration has been measured by students' opportunities for socialization or the network of friends and associates that a student has. Although it is important for students of color to have a safe space at predominately white campuses, it is equally important for them to feel comfortable in interracial interactions. Considering the often-segregated pre-college experiences of college students, there may be discomfort in crossing racial lines to make friendships on behalf of both students of color and whites (Locks *et. al* 2008). However, minority students who feel most attached to their schools, do have interracial friendships (Locks *et. al* 2008).

There are also differences in the importance of academic integration for minorities and whites. One of the ways in which schools have created

opportunities for academic integration is in residential learning communities. Residential learning communities are on-campus housing in which residents share some or all of their classes. Hotchkiss, Moore, and Pitts (2006) found that black students in these living-learning communities had significantly greater feelings of attachment to their school than those who were not in that unique academic and residential environment. The residential learning communities provided opportunities for academic integration that were more impactful for minority students than for whites.

The student-faculty mentoring relationship is another way to increase students' academic integration into the institution and increase their social capital. Upcraft, Gardner, and Associates (1989) argued that students are more likely to persist from one year to the next when they regularly meet with at least one professor. For minority and first-generation students, this importance of faculty contact was invaluable. Students who have never had a family member attend college or those who anxious about making contact with faculty are less likely to become academically integrated and may fall behind.

Students who are better socially and academically integrated at their institution are more likely to graduate from college. For black and Hispanic students, integration may be an even larger contribution to degree completion than their white peers because many black and Hispanic students are coming from communities that do not resemble the ones at college. While students are expected to facilitate most of the integration process (i.e.: going to class, making friends, etc.), institutions can also play a major role in encouraging integration.

Offering remedial classes to help academically underprepared students, maintaining an academic counseling center, or providing unique social and learning opportunities may help schools increase their minority student graduation rate.

Commitment to Educational Goals and Institution

A student's commitment to his or her educational goals may seem like an obvious predictor of retention, however, the concepts are difficult to measure. Cultural capital may help describe students' commitment to their educational goals. Students with parents or sibling who already went to college may have a greater commitment to college because they know what to expect and have examples of people in their lives who have already actualized the student's educational goal. Tinto (1975) argued that students are more likely to persist when they express commitment to both educational goals and to the institution and when the congruence between students' educational goals and institutional mission is mediated by academic and social components (Cabrera, Nora, and Castanoda 1993). The oppositional culture theory (Ogbu 1978) suggests that some Black and Hispanic students with strong commitments to their educational goals may abandon their commitment because they fear negative perceptions. Ogbu argued that some blacks and Hispanics do not want family and friends to perceive them as "acting white" and therefore underperform in school. The oppositional culture theory is nuanced with Tinto's revised model of student retention, which contended that a student must abandon the values of family and friends and adopt the values advocated by his or her institution (Tinto 1993).

Other research finds that the desire to do well in college does not necessarily correlate with college graduation for black and Hispanic students. Levinson, Cookson, and Sadovnik (2001) noted that while black and Hispanic students have similar educational aspirations to whites and Asians, their lower attainment levels are reflective of their lack of "know how" in actualizing their expectations. However, Wilson and Portes (1975) suggested that educational expectations themselves are generally mediated by grades and academic performance. If students perform well at a minimally challenging high school, they enter college with high expectations but low cultural capital. Wolfle (1985) compared the educational expectations of students from different races and finds that grades were significantly stronger predictors of educational expectations for black students than white students.

Black and Hispanic students are more likely to come to college both underprepared and with high expectations, a combination that may lead to drop out if not specifically addressed. Institutions with resources to support educational expectations, such as academic counseling or advising, are in a better position to retain their black and Hispanic students through graduation. Good college advising creates a bridge between what students aspire to do in college and what they are prepared to do in college.

Perceptions of Racial Campus Climate

Campus climate is an issue that affects retention for all students; however, minority students are significantly more likely to define campus climate in terms

of race relations than white students (Locks *et. al* 2008). Pewewardy and Frey (2002) examined minority and white assessment of campus climate on three different characteristics: racial climate, cultural diversity of courses, and attitudes about cultural differences. The authors found that minority students viewed campus climate, particularly racial campus climate, more negatively that their white peers. Cureton (2003) defined racial campus climate by students' assessment of their experiences at their institutions. He pointed out that perceived racial problems are just as important as actual racial problems because both affect students' academic performance and their overall educational experience (Cureton 2003). Cureton (2003) examined campus climate through attitudes toward the university, assessment of social situations unrelated to the university, expressions of confidence in abilities and attitudes toward the university's social and racial climate. He found that in all areas, blacks reported more negative experiences than their white peers. Minority students have also described campus climate in terms of racial comfort. Smedley, Myers, and Harrell (1993) found that minority students at predominately white institutions experienced stress on five factors: social climate, interracial stresses, racism and discrimination, within-group stresses, and achievement stress. These stressors can discourage a student from forming capital-building relationships with his or her peers.

Although both white and minority students experience similar intensity in negative feelings of racial tension, minority students reported more incidents of racial tension (Locks *et. al* 2008). Feeling racial tension on campus may deter

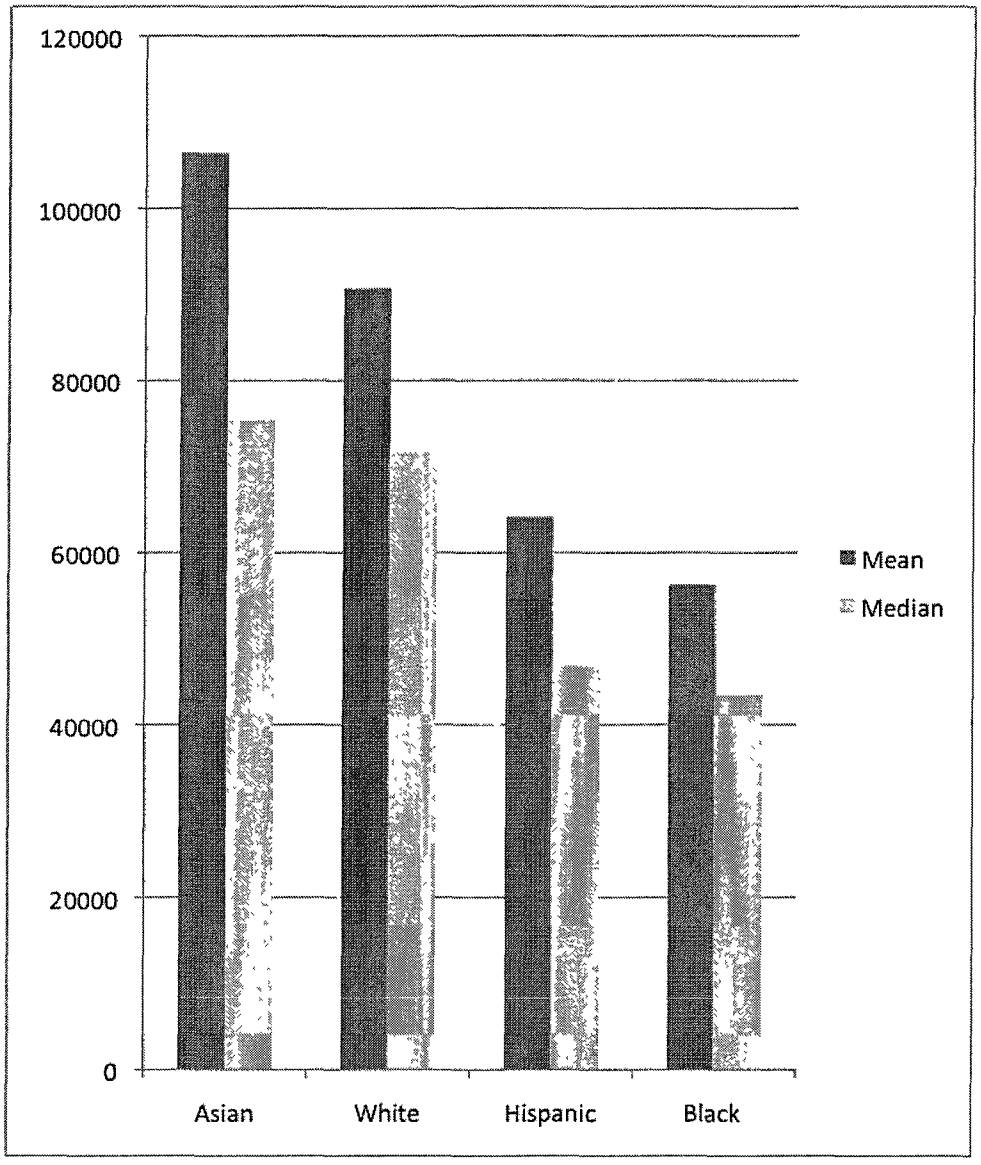
some minority students from wanting to form interracial relationships because they want to protect themselves from the tension. Feagin's (1991) analysis may explain the minority/white differences in feelings of racial tension. He wrote that blacks experience each racial incident as contributing to the aggregate of their experiences with racial incidents while whites experience racial incidents in isolation from one another. For example, if a minority student is detained by a white campus police officer for an infraction later called a "misunderstanding," the student of color may regard the situation as a racial incident because "misunderstandings" with white police may be a common occurrence for the student. Feagin's (1991) findings suggest that asking black and white students about the racial climate of the campus could result in completely different responses. Cureton (2003) argued that the different experiences that black and white students have in college may be because college life is a continuation of their pre-college experiences- including racial antagonism and perceptions of unfair treatment. Students' positive perception of campus climate is vital to creating a socially safe community for students of color.

It is important to examine racial campus climate as a predictor of college graduation because there are different effects for minority and for white students. I hypothesize that minority students who perceived a better racial campus climate are more likely to graduate. Institutions can help improve perceptions of racial campus climate on campus by promoting the enrollment of a diverse student body and increasing the diversity of faculty and staff.

Perceptions of Financial Security

The traditional student retention models did not focus directly on the necessity of financial capital for college or on the impact of education's cost on college retention, but it has become a more important factor in recent years- particularly for low-income students and students of color. The price of college has been steadily increasing since the 1980s (US Department of Education 2007). For example, in 1988 the average cost of attending a four-year public university with tuition, room, board, and mandatory fees was $4,214. By 2006 the cost had increased more than two and a half times to $11,034. The costs are considerably higher for private four-year institutions (National Center for Education Statistics 2007). The financial burden of getting an education affects all students but it is particularly challenging for students from low-income families (Bowen *et. al* 2009). Black and Hispanic students are more likely to come from single parent homes, have a lower household income, and are more likely to be first- generation college students than their white or Asian peers (Swail, Redd, and Perna 2003). Figure 1.3 shows the disparities in median household income among 45-54 year olds (the cohort most likely to have traditional-aged college students).

Figure 1.3: Median and Mean Household Income (in dollars) among Full-time, Year Round Workers 45-54 Year Olds by Race and Hispanic Origin, 2009



Source: American Community Survey 2009

Black and Hispanic students are more likely to come from families with significantly less ability to contribute than whites. These factors suggest a much greater need for financial aid and support in college. In 2004, 76% of black students and 63% of Hispanic students received financial aid in the form of a scholarship or loan compared to only 61% of white students (US Department of Education 2005). Any type of funding increases student retention, but for minority students the type of financial aid matters. Finske, Porter, and Dubrock (2000) found that ninety percent of students who received need-based grants were still enrolled at their institution by the end of their second semester. The completion rate for black and Hispanic students is lowest when their financial aid package emphasizes student loans, but loan aid is actually found to increase retention for white students (Murdock 1990, Perna 1998, and St. John 1991). Although most schools do provide some type of financial aid for minority students it is often not enough to meet their total financial needs (Lau 2003). Bowen *et. al* (2009) found that black and Hispanic students were particularly sensitive to even small increases in college costs. When institutions increase their tuition, room/board, or fees without also increasing the financial aid package, the student is left struggling to fund the difference. This task seems impossible for many black and Hispanic students, who are attending college with little financial help from home. Horn and Maw (1994) argued that receiving any type of aid is not related to whether student works or not, but is related to how much they work and where they work. Students who work less than fifteen hours a week have higher GPAs than those who work more than fifteen hours a week (Swail, Redd,

and Perna 2003), and students who work on campus are more likely to persist (Horn and Maw 1994). On- campus jobs help offset the costs of education and they have the equally important effect of strengthening student integration to the campus. Ishitani (2006) argued that sufficient funding opportunities for students and the availability of a knowledgeable funding counselor are critical for minority student retention.

Related to students needing additional money for college is the relationship between student employment and retention. Ishitani (2006) found that students who are employed off-campus have lower levels of involvement and feel less connected to the institution. Additionally, the more hours students spend working off campus, the less connected they feel to the school (Ishitani 2006). Ishitani's (2006) analysis of retention rates among first-generation college students found that these students were 81% more to graduate within four years if they had a work-study job compared to their first-generation peers without work-study jobs. Considering most work-study jobs are on-campus, Ishitani's study suggests that students feel more connected to their school when they are not spending their time away from campus at work. This significant finding suggests that providing access to more work-study jobs could have a positive effect on minority student retention.

It is impossible to get a full understanding of student retention without investigating the importance of financial aid. For example, students who worry about financial aid or are feel the need to work full-time jobs to pay for school are more likely to be distracted from their studies and thus less likely to graduate

from college. Institutions can mitigate the need for money or the concern about financial aid by providing many financial aid options. These strategies may include increasing the amount of grant aid to students, applying for federal financial aid programs, or providing employment centers the advise students while they are in school and once they graduate.

Summary of Student Retention

Retaining black and Hispanic college students requires creative approaches to the existing college retention strategies. Successful minority student retention depends on recognizing that historically underrepresented groups may have a different set of needs and require different support than their white peers. Much of the literature on retention has focused on the biographical, pre-college experiences, and amount of capital that students bring to their schools. I argue that while these variables are important to retention, they miss the in-college capital bridging opportunities that an institution may help a student acquire in college. Capital bridging opportunities refer to those that narrow the gap in college readiness between some white and some black and Latino students. For example, programs to help first-generation students navigate their university or an offering of refresher math classes may help bring some low-capital, but capable, students up to the level of their higher capital peers.

Buchmann and DiPrete (2006) described how family and neighborhood characteristics are used to predict a student's success in primary and secondary schools. Roderick (2006) explained that the quality of their secondary schools could be used to predict college aspirations. Similarly, the opportunities a

student has in college should be strong predictors of how they will complete their college tenure. The advantage of emphasizing institutional characteristics as predictor variables is that it allows the study to evaluate which and when minority student retention strategies are most effective.

The shift in unit of analysis from the individual student to a shared analysis of the individual student and the institution allows this study to approach student retention and graduation from a new direction. Institutions, not the individual, are at the very heart of Bourdieu's cultural capital theory. My intention is for this study to both highlight strategies for black and Hispanic student retention and to augment the discourse on the role of cultural capital in higher education.

There is much research to support the connection between capital, college student experiences, and educational attainment, but the ways in which these concepts are connected needs greater attention. Which student experiences are most influential to college graduation? How does the influence of these experiences differ by the capital that a student brings to college? I hypothesize:

H_1: There is an association between student experiences and degree completion status.

The student experiences in Hypothesis 1 will include the concepts: commitment to educational goals, social and academic integration, racial campus climate, and perceptions of financial security.

H_2: The association between student experiences and degree completion status is moderated by race/ethnicity.

For many college students, cultural, social, and financial capital deficiency is a barrier to completing their education. I expect to find this relationship in Hypothesis 2 because black and Hispanic students are more likely to have capital deficiencies compared to white and Asian students (Massey et. al 2006).

I expect to find positive associations between institutional characteristics that support the five primary student experiences and college student graduation. Therefore, it is proposed that:

> H_3: Institutional characteristics (reflections of students' academic preparation, programs to support students' commitment to educational goals, opportunities for social and academic integration, racial composition of campus, and financial characteristics of the institution) are associated with an institution's graduation rate.

Given the literature on racial differences in the impact of student experiences on an individual student's graduation status, I argue that a similar relationship may exist at the institutional level.

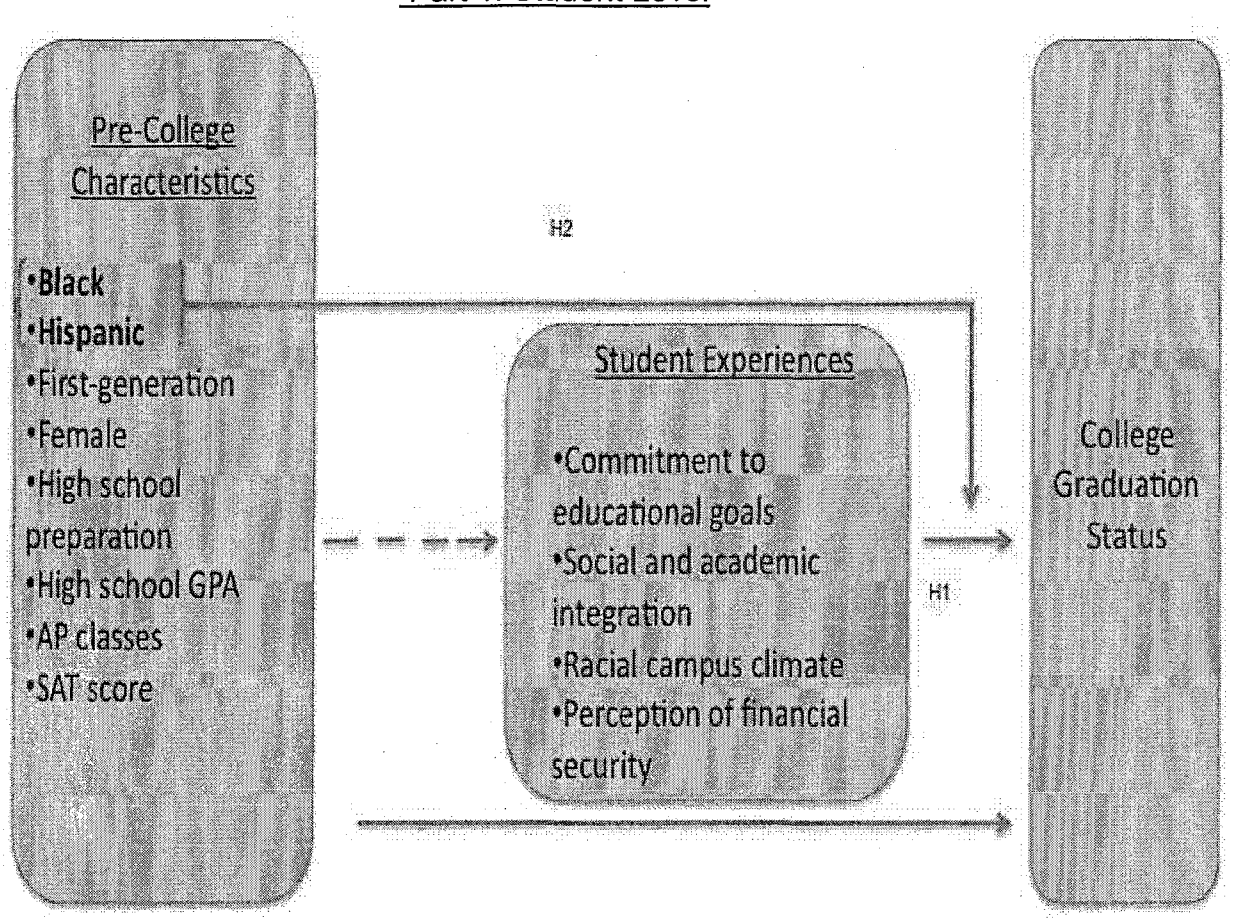
> H_4: The effects of institutional characteristics on college graduation rates are moderated by race/ethnicity.

The proposed hypotheses provide a means to test both the existence of differences between student experiences and institutional characteristics that support student experiences and an explanation for those differences. These student experiences are not direct measures of capital but are closely linked to capital and given the established consequences of capital deficit, they provide a

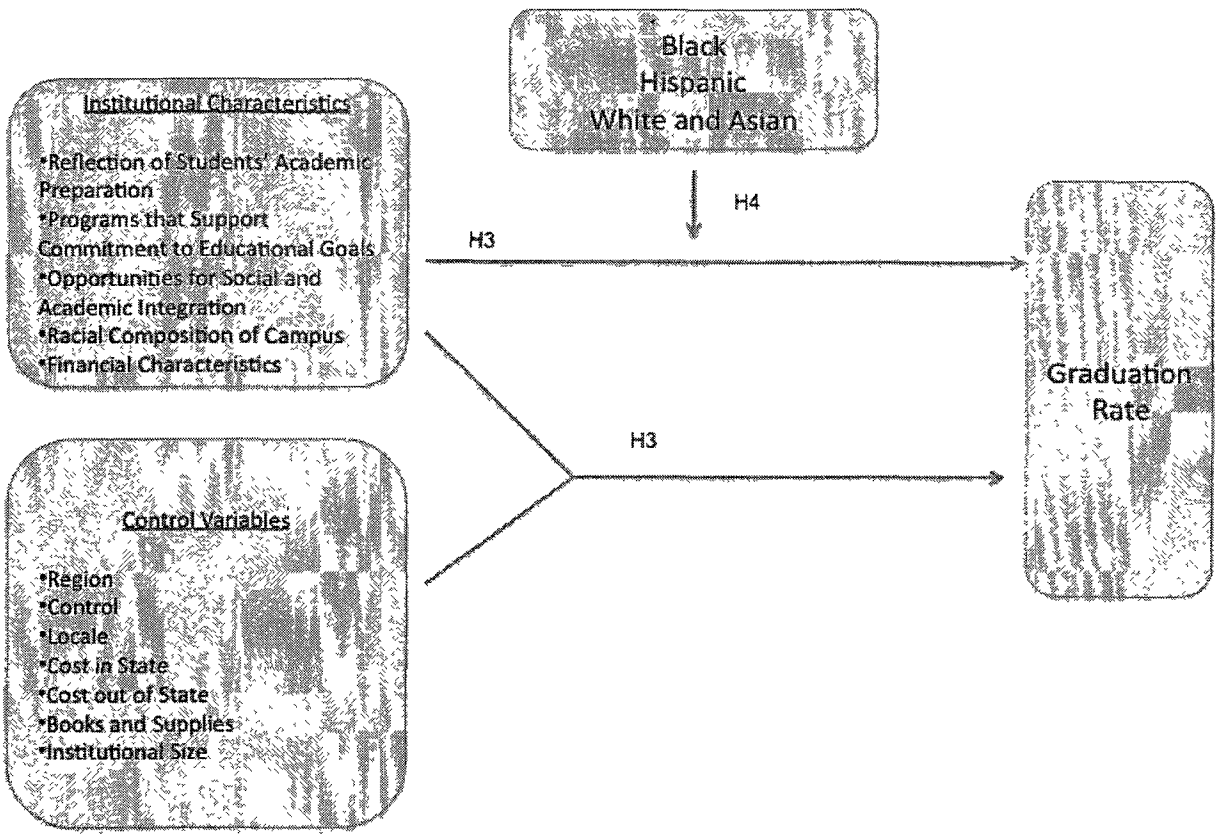
necessary framework for understanding the data and theories underlying education attainment. In order to conceptualize all of the elements of this study, I have developed a hypothesis model, shown in Figure 1.4.

This study investigates college graduation at two levels of analysis. First, individual-level student data are used to explain how the experiences and attitudes of students at the colleges and universities in this study are related to college completion. Second, institutional data suggests how institutional characteristics may lessen the challenges for black and Hispanic students and facilitate their graduation. Approaching black and Hispanic student college graduation from both levels of analysis allows me to present a more thorough explanation of education attainment and to develop strategies for increasing retention and graduation rates.

Figure 1.4: Conceptual Model



Part 2: Institutional Level



CHAPTER 2

METHODOLOGY

The purpose of this study is to examine factors that contribute to graduation at colleges and universities in the United States. This study also investigates whether or not college degree completion varies by a student's minority status. My investigation of factors that contribute to college graduation is dual-pronged. In Part 1 of this study, I test Hypothesis 1 and Hypothesis 2 using data from the National Longitudinal Survey of Freshmen. The findings from these hypotheses tests are conceptually related, but empirically independent from Part 2 of the study. Both sets of hypotheses test student experiences concepts derived from the literature but at different levels of analysis. The empirical separation of Hypothesis 1 and Hypothesis 2 from Hypothesis 3 and Hypothesis 4 is only necessary because the different data sets used are not comparable. Part 2 tests Hypothesis 3 and Hypothesis 4 using data

from the Integrated Postsecondary Education Data System. Two research questions guide the research:

1) Which kinds of student experiences are associated with college student graduation?

2) Do the institutional characteristics at colleges or universities make a difference in whether or not a student graduates?

This study uses two different datasets to investigate the relationship between students' in-college experiences and eventual college graduation. The first dataset, the National Longitudinal Survey of Freshmen (NLSF), is comprised of student level data from twenty-eight elite colleges and universities in the United States. I use the NLSF data to test the relationship between student experiences and college graduation status (Hypothesis 1 and Hypothesis 2). The second dataset is comprised of data from the Integrated Postsecondary Education Data Survey (IPEDS) and includes 2,548 four-year, degree-granting institutions in the United States. I use the IPEDS data to test the relationship between institutional characteristics and college graduation rates (Hypothesis 3 and Hypothesis 4).

These two datasets allow me to answer both research questions. Although I will be unable to empirically link the findings to one another, I do conceptually link them through a discussion of the same types of characteristics at the two levels. I expect that this approach will produce a unique and comprehensive study.

Part 1: The National Longitudinal Survey of Freshmen

The NLSF is an instrument administered by the Office of Population Research at Princeton University. It was developed by Douglas Massey and Camille Charles to track the academic and social experiences of nearly 4,000 white, Asian, Latino, and black undergraduates at twenty-eight selective colleges and universities. The survey was created to test explanations of minority underachievement (e.g. capital deficiency, oppositional culture, stereotype threat, and peer group influence) at college by not only measuring the scholastic achievement of students, but also by analyzing these theoretical explanations of minority achievement as they relate to background differences in students' pre-college experiences such as social class, nativity, pre-college interracial contact, and gender. Data were collected between fall 1999 (when the students were in their first semester of college) and spring 2004 (five years after students began college). Institutions were classified as private research (n=16, 57%), public research (n=5, 18%), liberal arts (n=7, 25%). A list of these institutions is in Appendix 1.

Two methods were used in data collection. First, researchers conducted face-to-face interviews with students to obtain background and demographic information. This initial interview took place during fall 1999, the first semester of the participants' first year. Second, subsequent phone interviews occurred in the spring semester of each academic year beginning in 2000 and ending in 2004. The final interview, conducted in 2004, was intended to be a post-graduation follow-up. Although some students did not persist from one year to the next or

transferred institutions, most were tracked, interviewed, and remained part of the study (Massey et. al. 2003). The data used in this study come from both students who persisted through graduation and those who dropped out of school.

Sample Selection

A stratified sampling technique was used to obtain the sample of student participants in the NLSF. Researchers developed their sampling method based on the total number of black students enrolled at the participating institutions. They made four strata of institutions and determined a specific number of students to sample within each stratum. The first category included institutions with a black population greater than 1000. Researchers targeted seventy students from four ethnic groups (Asian, black, Hispanic, and white) that resulted in a total of 280 participants from these institutions. The second stratum was comprised of institutions that enrolled between 500 and 1000 black students. Fifty students from each ethnic group were targeted for a total of 200 participants. The third stratum included institutions with 100-500 black students. At these intuitions, twenty students from each age group were targeted. In the fourth strata, institutions with fewer than 100 black students, forty were interviewed (ten from each of the four ethnic groups). Seventy students participated at the on HBCU included in the study (Massey et. al. 2003).

The sample for the present study includes all students participating in the NLSF. Since part of the study specifically examines the experiences of underrepresented students. White and Asian students are not historically

underrepresented in higher education, therefore I group white and Asian students to use them as the comparison group for black and Hispanic students (Ovink and Veazey 2011). The final sample of students includes 1,051 black students, 951 Hispanic students, and 1,957 white and Asian students.

Instrumentation

The present study uses data collection from all waves of the NLSF. The Wave 1 baseline survey items were designed to provide information about respondents' family background, peers, high school quality, neighborhood environment, and a variety of social issues. Wave 1 also included some supplementary data; scales that correlated some of the items in the original survey, institutional characteristics, and a household roster. The second wave of the survey asked questions about respondents' coursework, daily activities, financial matters, attitudes toward college, perceptions of prejudice on campus, romantic relationships, and the next year's college plans. The Wave 3 survey asked students about their courses, future plans, SATs and ACTs, time spent in college, social networks, financial issues, and perceptions of prejudice. The fourth wave includes survey items on the respondent's academic progress at their institution, racial separation on campus, summer employment, weekly activities in college, mentoring, extracurricular involvement, assessment of their academic situation, financial matters, perceptions of prejudice, romantic relationships, and personal health. The Wave 5 survey asked students about their academic progress, distractions, employment during the academic year,

financial matters, relationship status, health and well-being, evaluation of their total college experience, racial attitudes, self-consciousness in college, and racial diversity on campus (Massey et. al. 2003). Questions from all five waves of the NLSF are used to examine the influence of student experiences on college graduation.

Data Collection Procedures

Before beginning data analysis of the NLSF, I obtained permission to conduct the study for the University of New Hampshire's Institutional Review Board (IRB). The IRB monitors all research conducted by faculty and students at the University of New Hampshire. I submitted appropriate forms to the IRB and the director of the IRB granted approval to proceed with the study. A copy of this approval letter from the IRB has been included in Appendix 4.

In order to gain access to the NLSF dataset, I registered online to become an authorized user of the data with the Office of Population Research at Princeton University, where this dataset is stored. I also completed a User Agreement form, briefly described my study, and agreed to use the data in an ethical and appropriate manner for dissertation research. Access to the entire dataset was granted after submitting this from.

I logged on to the registered users site and entered the NLSF data archive. From this archive, I downloaded all of the waves, institutional data, and graduation data to my computer. The data were made available in an SPSS file and were converted to a Stata file.

Student Graduation as an Outcome Variable. Six-year college graduation is the primary outcome variable in the first part of this study. The variable, termed *College Graduation Status*, is scored as a 1 if the student received a degree from his or her original or transfer college within six years. The NLSF does not distinguish the reason that a student may not have graduated from college; dropouts, stopouts, or students continuing into their seventh year are all scored as 0. Graduation status by race/ethnicity is presented in Table 2.1.

Table 2.1: Graduation Status by Race/Ethnicity				
	Total Population in Sample		Total Graduates in Sample	
Racial/Ethnic Groups	N	%	N	%
All Groups	3914	100	3387	86.54
Asian	951	24.29	853	89.70
Black	1051	26.85	834	79.35
Hispanic	915	23.37	787	86.01
White	997	25.47	913	91.57

3,914 students in the sample have graduation data and the total number of graduates is 3,387- an overall graduation rate of 86.54%. Noticeable features here include the relatively high graduation rates of white students and the relatively low graduation rates for black students (see Table 2.1). Although the graduation rates of both black and white students are higher than the national averages for students in their respective groups, the disparity between the groups in this sample is marked (x^2= 76.63).

Independent Variables: Pre-College Characteristics and In-College Experiences

The first set of independent variables describes students' pre-college characteristics, summarized in Table 2.2.

Table 2.2: Independent Variables: Pre-College Characteristics	
Pre-college characteristics	*Race/Ethnicity* *Wealthy* *First-Generation* *Female* *High School Preparation for College* *High School GPA* *AP Classes* *SAT*

The second set of variables, in-college student experiences, have all been derived from concepts that the literature suggests are related to college graduation (see Table 2.3).

Table 2.3: Independent Variables: In-College Experiences	
Concept	Variable
Commitment to Educational Goals	*High Graduation Importance* *Finish 1 Year* *Finish 2 Years* *Graduate from College* *Post Graduate Work* *Finish Graduate Degree* *Peer Help* *Institutional Help* *Professorial Help* *Library Lab*
Social and Academic Integration	*Mentor* *Extracurricular* *Studying* *Activities* *Television* *Working* *Partying* *Sleeping* *On-Campus*
Racial Campus Climate	*Racial Separation* *Uncomfortable* *Requested ID* *Students Derogatory Remarks* *Professors Derogatory Remarks* *Harassment* *Harassment Same Race* *Bad Grade Race* *Discouraged Speaking* *Discouraged Course* *Professors of Color* *Students of Color*
Perceptions of Financial Security	*Aid Problems* *Aid Importance* *Cost Importance* *Parental Contribution*

Pre-College Characteristics. Pre-college characteristics used in this study are comprised of both demographic and academic preparation variables. Basic descriptive statistics are presented in Table 2.4.

Table 2.4: Pre-college Characteristics (Demographics)					
Variable	N	Mean	Std. Dev.	Min	Max
Black	3924	0.268	0.443	0	1
Hispanic	3924	0.233	0.423	0	1
Asian	3924	0.244	0.430	0	1
White	3924	0.254	0.436	0	1
Wealthy	3924	0.496	0.500	0	1
First-Generation	3709	0.666	0.472	0	1
Female	3924	0.581	0.493	0	1

The race/ethnicity variables come from a survey question asking students to identify their ethnicity. Students were given the options: African American or Black, Hispanic, White, and Asian (Wave 1, NLSF). This variable was dummy-coded into four separate race variables where 1 represented a student being a member of the described race and 0 represented a student not being a member of the described race. In the sample, about 27% of students are black, 23% are Hispanic, 24% are Asian, and 25% are white. Students were asked, "Please Look At This Card And Tell Me Your Estimate Of The Annual Income Of The Household In Which You Spent Your Senior Year Of High School?" (Wave 1, NLSF). Students who indicated that their households had an annual income of $75,000 or more were coded as 1 and every other income level was coded as 0. About 49% of students in this sample have household incomes over $75,000.

The *First-Generation* variable comes from two survey questions, "What is the highest level of education completed by your mother or the woman most responsible for raising you?" and "What is the highest level of education completed by your father or man most responsible for raising you?" (Wave 1, NLSF). If the respondent indicated that either the mother or father had earned a college degree or higher, he or she was coded as 0 (not first-generation). About 66% of students are first-generation students. *Female* is a dichotomous variable identifying the males and females in the survey; 58% of the sample are female (Wave 1, NLSF).

Four dimensions of academic preparation are investigated: student's assessment of academic preparation for college, student's high school grade

point average, student's participation in advanced placement classes, and student's combined quantitative and verbal SAT scores (Table 2.5).

Table 2.5: Pre-college Characteristics (Academic Preparation)					
Variable	N	Mean	Std. Dev.	Min	Max
High School Preparation	3727	6.402	2.940	0	10
High School GPA	3743	22.246	1.961	10	24
AP Classes	3924	0.893	0.309	0	1
SAT	2556	1322.017	156.782	0	1600

First, students were asked to assess their own academic preparation for college with the question, "On a scale of zero to 10, where zero indicates total disagreement and 10 indicates total agreement, how much do you agree or disagree with each of the following statements about college? My high school prepared me well for college work (Wave 2, NLSF)." This variable, *High School Preparation,* had a mean value of 6.40 indicating that students in the sample felt generally prepared for college. *High School GPA* is a variable derived from survey questions about the respondent's grades in high school. Students were asked, "For each of the following subjects, did you get mostly A's, mostly B's, mostly C's, mostly D's or mostly grades below D in: English, History, Mathematics, Natural Science, Social Studies, and Foreign Language" (Wave 1, NLSF)? The grades in each of these subjects were added together to create the variable, *High School GPA.* This variable ranged between 10 and 24, and had a mean value of 22.24, suggesting that the students in the sample made As in most of their high school classes. For the variable *AP Classes,* students were asked, "In which subjects, if any did you take an advanced placement class" (Wave 1, NLSF)? Students were given the choice of thirty-one AP classes, an "other" option, and a "no advanced placement classes" option. I coded the variable to be dichotomous; students either took at least one AP class or they did not take any AP classes. About 89% of students in the sample had taken at least one advanced placement course. The variable, *SAT,* is a composite variable based on two survey questions, "What was your SAT verbal score?" and "What was your SAT quantitative score" (Wave 3, NLSF)? The mean SAT score for

these students is 1322 and is well above the 1998 threshold for the 75th percentile score of 1170 (The College Board 1998).

Commitment to Educational Goals. The concept, "Commitment to Educational Goals" is measured by survey questions about students' educational aspirations and their use of academic assistance. These variables include: student's perception of graduation importance, student's desire to finish one year of college, student's desire to finish two years of college, student's desire to graduate from college, student's desire to complete some post graduate work, student's desire to finish a graduate degree, frequency with which student's seek peer help for their studies, frequency with which student's seek institutional help with studies, frequency with which students seek professorial help with studies, and the frequency with which students visit a library or laboratory for academic purposes. Summary statistics for all of the Commitment to Educational Goals variables are listed in Table 2.6.

Table 2.6: Commitment to Educational Goals					
Variable	N	Mean	Std. Dev.	Min	Max
High Graduation Importance	3420	0.899	0.302	0	1
Finish 1 Year	3923	9.929	0.540	0	10
Finish 2 Years	3923	9.878	0.618	0	10
Graduate from College	3922	9.773	0.765	0	10
Post Graduate Work	3922	8.126	2.057	0	10
Finish Graduate Degree	3913	7.871	2.191	0	10
Peer Help	3728	3.858	2.070	0	10
Institutional Help	3728	1.290	1.615	0	49.75
Professorial Help	3728	3.298	1.899	0	21
Library Lab	3728	4.216	2.058	0	28.5

The variable "*High Graduation Importance*" comes from a survey question asking,

> Using the same scale of 0 to 5, where zero indicates no importance whatsoever and 5 indicates the utmost importance, in thinking about how hard you try in your college studies, how important for you is the following consideration: Graduating from college (Wave 3, NLSF)?

The graduation importance variable is dichotomized at the natural break in the frequency distribution; nearly 90% of students reported a "5" of the graduation importance values. *High Graduation Importance* is a dichotomous variable where "1" represents students who scored a "5" on the original variable and "0" represents all other students. About 89% of students reported high graduation importance. Students were also asked a series of questions about how much schooling they expect to complete,

> Please estimate the probability that you will complete each of the following educational milestones. That is, on a scale from 0 to 10, where 0 means it's extremely unlikely and 10 means that it's extremely likely, what is the likelihood that you will: finish one year of college, finish two years of college, graduate from college, go on for more education after college, complete a graduate or professional degree (Wave 1, NLSF).

Although the mean values slightly decreased for each additional increment of schooling, students in the NLSF generally reported a high likelihood of completing all levels of education.

The NLSF contained a series of questions about typical behaviors in college in which a student might engage when he or she needs academic support. A reliability coefficient was calculated for each of the constructed variables to determine how accurately the survey questions being used for the

study measure the theoretical constructs they were intended to measure (Hinkle, Wiersma, and Jurs 2003). The coefficient, Cronbach's alpha (α) is a frequently used index for reliability coefficients that ranges from 0 to 1. Values of .5 and above suggest that the variables are closely related to each other. Conversely, values of .499 and below represent a weak association between the variables (Hinkle, Wiersma, and Jurs 2003).

The base question was, "On a scale of zero to 10, where 0 indicates you never engage in a behavior and 10 indicates you always do, please tell me the frequency in which you: " (Wave 2, NLSF). The variable *Peer Help* was generated from adding the survey questions: "Study with other students," "Organize study groups with friends or classmates," and Seek academic help from a friend or classmate" (Wave 2, NLSF). This variable has a Cronbach's alpha of .752. The variable *Institutional Help* is the sum of the following survey questions:

> Take special instruction to improve writing skills," "Take special instruction to improve reading skills," "Take special instruction to improve mathematical skills," "Take special instruction to improve test taking skills," "Take special instruction to improve study skills," Visit an academic advisor to discuss your progress," and "Seek help from a formal tutor (Wave 2, NLSF).

The Cronbach's alpha for this variable is .793. The variable *Professorial Help* was generated by adding the survey questions,

> [How often do you] Raise your hand during a lecture when you don't understand something, Approach professors after class to ask a question, Ask professors questions in class, Meet your professors in their offices to ask about material your don't understand, Meet with professors in their offices to talk about other matters (Wave 2, NLSF).

The Cronbach's alpha for this variable is .760. Finally, *Library Lab* is a variable made of these survey questions, "Study in the library," "Look for a book or article in the library," "Use the campus computer lab," "Use the internet for course-related work" (Wave 2, NLSF). The Cronbach's alpha for *Library Lab* is .493. Students did not report frequently participating in any of the academic support behaviors. The mean values ranged from 1.28 (*Institutional Help) to* 4.21 (*Library Lab).*

Social and Academic Integration. The variables that operationalized social and academic integration come from survey questions about social support, typical college behaviors, and type of living arrangements. Table 2.7 displays the summary statistics for the Social and Academic Integration variables.

Table 2.7: Social and Academic Integration					
Variable	N	Mean	Std. Dev.	Min	Max
Mentor	3154	0.444	0.497	0	1
Extracurricular	3416	1.1534	0.950	0	5
In-Class	3723	18.289	8.245	0	117
Studying	3718	19.343	11.667	0	120
Activities	3724	8.060	8.098	0	100
Television	3727	4.271	5.739	0	53
Working	3727	4.275	6.685	0	60
Partying	3728	3.674	4.161	0	50
Sleeping	3718	34.166	10.272	0	100
On-Campus	3728	0.961	0.193	0	1

The variable *Mentor* comes from the survey question, "Now, in college, is there anyone besides your parents or the person who raised you who serves as a mentor, that is, a role model, guide, and source of encouragement and inspiration" (Wave 4, NLSF). *Mentor* is a dichotomous variable; the student indicated that she or he either had a mentor or did not have a mentor. About 44% of students report having a mentor. The NLSF asks students a set of questions about extracurricular activities in which they might be involved, "In which of the following groups are you currently involved: A varsity or junior varsity sports team? An intramural team? A sports club? A fraternity or sorority? A political group? Other voluntary group" (Wave 3, NLSF). All of these activities are added together to make an index of the number of extracurriculars in which students participated (*Extracurricular*). The next set of variables comes from a set of questions asking students about how they spend their time during the week. The survey question,

> Now, please think about how you spent your time during the last full week of classes, Monday through Friday. As I read a list of activities, please estimate the total number of hours, if any, that you spent doing each of these activities. Attending class or lab? Studying? Doing extracurricular activities? Watching television? Working for pay? Attending parties? Sleeping? (Wave 2, NLSF).

The variable, *On-Campus*, comes from the survey question, "Do you currently live on campus?" (Wave 2, NLSF).

Racial Campus Climate. The survey questions used to measure racial campus climate ask students about their perceptions of inter and intrarace relations and the general compositions of their classrooms. The perceptions of racial campus climate include: degree of racial separation, frequency with which

students or professors made respondent uncomfortable, frequency with which respondent is uncomfortable walking around campus, frequency with which respondent is asked for identification on campus, frequency with which students or professors make racially derogatory remarks to respondent, frequency in which respondent experiences harassment, frequency with which a student is discouraged from speaking in a course or from taking a course because of his or her race, the number of black, Hispanic, Asian, or white professors that taught a student, the percentage of black, Hispanic, Asian, or white students in respondent's class. The summary statistics for all of the Racial Campus Climate variables are listed in Table 2.8.

Table 2.8: Perceptions of Racial Campus Climate					
Variable	N	Mean	Std. Dev.	Min	Max
High Racial Separation	3142	0.402	0.490	0	1
Uncomfortable because of Race	3726	1.489	0.6324	1	5
Requested ID	3723	1.251	0.710	1	5
Student Derogatory Remarks	3724	1.673	.851	1	5
Professor Derogatory Remarks	3723	1.120	.408	1	5
Students of Color	3724	1.673	0.851	1	5
Professors of Color	3723	1.20	0.408	1	5
Harassment	3724	1.243	0.557	1	5
Harassment Same Race	3724	1.370	0.726	1	5
Bad Grade Race	3725	1.094	0.387	1	5
Discouraged Speaking	3725	1.088	0.379	1	5
Discouraged Course	3726	1.251	0.604	1	5
Professors of Color (#)	3718	1.393	1.564	0	19
Students of Color (%)	3643	31.595	21.824	0	100

The survey question, "How would you characterize the degree of racial separation on the campus of (name of most recent college attended)? Would you say it is very little [1], slight [2], some [3], substantial [4], or very substantial [5]?" was the survey question asking students about their perceptions of racial separation on campus (Wave 4, NLSF). The original *Racial Separation* variable is normally distributed, but is dichotomized to facilitate a more robust interpretation of the analyzes. The variable *High Racial Separation* describes students who ranked racial separation as either a "4" or a "5."

The next set of variables come from survey questions in Wave 2 of the NLSF. A series of variables are combined to make *Uncomfortable* (α= .756). The survey questions used to make this variable include,

> How often, if ever, have students in your college classes ever made you feel uncomfortable or self-conscious because of your race or ethnicity?, How often, if ever, have any of your college professors made you feel uncomfortable or self-conscious because of your race or ethnicity?, Walking around campus, how often, if ever, have you been made to feel uncomfortable or self-conscious because of your race or ethnicity?

Requested ID is made from the survey question, "Except for security guards at building entrances, how often, if ever, have the campus police asked you to present identification?" *Students Derogatory Remarks* is made from the survey question, "How often, if ever, have you heard derogatory remarks made by fellow students about your ethnic group?" *Professors Derogatory Remarks* is made from the survey question, "How often, if ever, have you heard derogatory remarks made by professors about your racial or ethnic group?" *Harassment* is made from the survey question, "How often, if ever, have you experienced any

other form of harassment on campus simply because of your race or ethnicity?" *Harassment Same Race* is created from the variable, "How often, if ever, have you experienced harassment from members of your own race or ethnic group because you interacted or associated with members of some other group?" The variable *Bad Grade Race* is created by the survey question, "How often, if ever, have you felt you were given a bad grade by a professor because of your race or ethnicity?" The variable *Discouraged Speaking* is created from the survey question, "How often, if ever, have you felt you were discouraged by a professor from speaking out in class because of your race or ethnicity? The variable, *Discouraged Course* is created from the survey question, "How often, if ever, have you been discouraged from a course of study by your advisor or professor?"

Students are also asked about the racial composition of their classrooms with the question, "In the courses you have taken so far this year, how many of your professors have been: African American or Black? Hispanic? Asian? White?" The responses for these questions are added to create the variable *Professors of Color.* Similarly, responses to the question, "Thinking back to the very first class you attended at (College), roughly what percentage of the students were: African American or Black? Hispanic? Asian? White?" are added to create the variable *Students of Color.*

Perceptions of Financial Security. I use six variables to investigate a student's perception of his or her own financial security on graduation: student's perception of aid problems, student's perception of financial aid importance, student's perceptions of college cost importance, number of hours per week students work, and parental contribution to student's college education. The summary statistics for the perceptions of financial security variables are in Table 2.9.

Table 2.9: Perceptions of Financial Security					
Variable	N	Mean	Std. Dev.	Min	Max
Aid Problems	3725	2.169	2.806	0	10
Aid Importance	3923	5.799	3.845	0	10
Cost Importance	3922	5.147	3.535	0	10
Parental Contribution ($1,000)	3618	14.385	13.431	0	100

The survey question, "On a scale of zero to 10, where zero indicates total disagreement and 10 indicates total agreement, how much do you agree or disagree with each of the following statement about college? I am having problems with my financial aid," became the variable *Aid Problems* (Wave 2, NLSF). The NLSF also asked a series of questions about why the respondent decided to attend his or her particular college. The two questions from which the *Aid Importance* and *Cost Importance* variables were derived are, "On a scale of 0-10, how important were the following considerations in choosing where to attend college, where 0 indicates it was extremely unimportant and 10 indicates it was extremely important. Cost? Availability of financial aid" (Wave 1, NLSF)? *Parental Contribution* is derived from the survey question, "Of your best estimate of the total amount of money you needed to attend school this current academic year, how much will be funded from parental contributions" (Wave 2, NLSF). This variable, measured in $1,000 dollar increments, reveals that parental contribution to college ranges between $0 and $100,000.

Analysis Plan for Hypothesis 1 and 2 Models

Hypothesis 1 investigates the relationships between student experiences and college graduation status. I use a multilevel modeling technique in the analysis for Part 1 of this study. Multilevel modeling is appropriate because it recognizes the nested relationship between students and their institutions. Single-level logistic regression assumes independent errors, however; the errors

in nested data are necessarily dependent. Multilevel models allow me to examine the impact of student experiences on college graduation while controlling for institutional characteristics. The models in this analysis contain all student-level predictor variables. It is important to note that none of the equations contain random-effects at level 2 because none of the variables' effects are expected to vary across schools; the schools in the NLSF were chosen for their high-selectivity and similarity to one another (Massey *et. al* 2006).

The multilevel logistic analysis involves three steps. The first step involves fitting an unconditional or baseline model. This model (termed Model 0) is called the unconditional model because it does not include any independent variables and expresses the predicted likelihood of a student graduating from college without controlling for any other variables. (Luke 2004). The second step assesses the effect of a student's pre-college characteristics on college graduation status (Model 1). Next, I add student experiences to the Model 1 equation to test if they mediate the relationship between pre-college characteristics and college graduation status (Model 2). Finally, in Model 3, I include interaction terms to test whether or not race/ethnicity moderates the relationship between student experiences and college graduations status.

Part 2: The Institutional Characteristics and Resources Data

Obtaining appropriate data to test Hypothesis 3 and Hypothesis 4 was challenging. In February 2010, I began contacting schools to invite them to participate in my institutional resources survey. My initial contact was a phone conversation with each school's Director of Institutional Research (or similar title). When this effort failed to encourage enough participation, I moved to contact each school's Director of Multicultural Student Affairs (or a similar title). In total, 19 schools began responding to my institutional research survey, but only five institutions actually completed the survey. My next strategy was to collect data though through the websites of the 29 schools from the National Longitudinal Survey of Freshmen. While I did find some interesting information, this non-systematic method produced a lot of missing data and was not suitable for statistical analysis. Finally, I decided to use data from the 2008 IPEDS survey. IPEDS data does not completely capture the institutional resources that I originally sought, but they do provide a comprehensive picture of institutional characteristics at colleges and universities in the United States. Additionally, the availability of IPEDS data allows me to expand my sample size to all four-year, degree granting institutions rather than only those institutions in the NLSF.

The Integrated Postsecondary Education Data System (IPEDS) is a data collection program created by the National Center for Education Statistics in 1992. Reporting IPEDS data is mandatory for all postsecondary institutions receiving federal student financial aid. Table 2.10 presents the eight major data categories collected by IPEDS.

Table 2.10: IPEDS Categories	
Data Category	Contents
Institutional Characteristics	General information about the institution including: name and address, educational offerings, control, admissions requirements, student charges
Degree Completions	Degree completions data for all award levels including: race/ethnicity, gender, field of study
12-Month Enrollment	12 month enrollment data for all enrollment levels including: race/ethnicity, unduplicated headcount, instructional activity, full-time equivalent enrollment
Human Resources	Employees by assigned position including: full or part-time status, faculty by contract length, tenure of faculty by academic rank, faculty salaries
Fall Enrollment	Fall enrollment for all students enrolled in credit-bearing courses/programs including: race/ethnicity, gender, residence and high school graduation status, age, cohort numbers
Finance	Financial condition of the institution including: revenue by source, expense by function, physical plant assets, endowment investments
Financial Aid	Financial aid data for full-time, first time degree and certificate seekers including: number of students receiving each type of financial assistance and average amount received by type
Graduation Rates	Graduation data includes: race/ethnicity, gender, number of new enrollments, number of students completing program within one and a half times normal period, number of students who transferred

Dependent Variable: Graduation Rate. I use four different dependent variables: *Total Graduation Rate, Black Student Graduation Rate, Hispanic Student Graduation Rate, and White and Asian Student Graduation Rate*. All of the graduation rates are based on the 2008 IPEDS report. The graduation rates are defined by first-time, full-time students from the 2002 cohort who graduate from college within 150% of the normal time (six-year graduation rate). The *Total Graduation Rate* reflects students of all races/ethnicities from the 2002 cohort. The *Black Student Graduation Rate* variable reflects the non-Hispanic black graduation rate at schools with more than twenty black students. Similarly, the Hispanic student graduation rate reflects the *Hispanic Student Graduation Rate* at schools with more than twenty Hispanic students. Constructing the graduation rates of both black and Hispanic students this way was necessary to normalize their distribution and eliminate misleading graduation rates (i.e. schools with a zero percent graduation rate but only two black or Hispanic enrolled students). The *White and Asian Student Graduation Rate* is the unweighted average of both the non-Hispanic white student graduation rate and the Asian student graduation rate.

Table 2.11 Graduation Rates for Black, Hispanic, and White and Asian Students					
Variable	N	Mean	Std. Dev.	Min	Max
Total	2129	50.206	20.339	2.5	100
Black	1827	39.580	25.551	0	100
Hispanic	1644	42.988	26.453	0	100
Mean White/Asian	2129	45.752	24.352	0	100

The graduation data summary statistics show that 2,129 schools in IPEDS reported graduation data. The average graduation rate for all students was 50.21 and reflects the national average graduation rate for all students. The graduation rates for black and Hispanic students are markedly below both the total graduation rate and the graduation rates for white and Asian students.

Independent Variables: Institutional Characteristics

Table 2.12 lists the main concepts investigated in this study and the variables derived from those concepts.

Table 2.12: Institutional Characteristics	
Concept	Variable
Reflection of Students' Academic Preparation	*Remedial classes* *Mean 75th Percentile Verbal SAT score* *Mean 75th Percentile Math SAT score*
Support for Students' Commitment to Educational Goals	*Distance Learning* *Study Abroad* *Weekend Classes* *Per Capita Academic Support Funding*
Opportunities for Students' Social and Academic Integration	*ROTC* *Employment Services* *Placement Services* *Per Capita Student Services Funding*
Racial Composition of the Campus	*Percent Black Students* *Percent Hispanic Students* *Percent White and Asian Students*
Financial Characteristics of an Institution	*Percent Financial Aid* *Percent Pell Grant* *Average Pell Grant* *Percent Institutional Grant Aid* *Average Institutional Grant Aid* *Percent Loan Aid* *Average Loan Aid* *Per Capita Endowment*
Controls	*Region* *Control* *Urbanity* *Cost-In-State* *Cost Out-of-state* *Books and Supplies* *Institutional Size*

Reflection of Students' Academic Preparation. Academic preparation has been studied as a predictor of whether or not a student will graduate from college. At the student-level, I explore this concept through student assessment of their own academic preparation, grades, and standardized test scores. At the institutional level, I use variables that measure the general academic preparation of students at the institution.

I use the presence of remedial classes and SAT scores as the variables to describe an institution's academic preparation characteristics. *Remedial*, a dichotomous variable, denotes whether or not the institution offers any courses "designed for students deficient in the general competencies necessary for a regular postsecondary curriculum and educational setting" (IPEDS 2009). I also use data about an institution's mean 75th percentile verbal and math SAT Reasoning Test scores (*Mean 75th Percentile Verbal SAT score* and *Mean 75th Percentile Math SAT score*).

Descriptive statistics for the variables that reflect students' academic preparation are listed in Table 3.13.

Table 2.13: Reflection of Students' Academic Preparation					
Variable	N	Mean	Std. Dev.	Min	Max
Remedial	2502	0.716	0.451	0	1
Mean 75th Percentile Verbal SAT Score	1238	584.135	68.892	410	800
Mean 75th Percentile Math SAT Score	1247	589.512	70.152	398	800

About 71.6% of the schools in the dataset offer some type of remedial class. On average, institution's mean 75th percentile verbal SAT score is 584.13. The mean 75th percentile math SAT score is 589.51.

Support for Students' Commitment to Educational Goals. Students' commitment to their educational goals is an important contributor to college graduation. The variables that measure this concept at the institutional level focus on programs and initiatives to help students commit and fulfill their educational goals. The variables used to operationalize this concept specifically refer an institution's education support initiatives.

Distance Learning is a dichotomous variable that describes the presence of an "option for earning course credit at off-campus locations via cable television, internet, satellite classes, videotapes, correspondence courses, or other means" (IPEDS 2008). *Study Abroad* is a dichotomous variable that describes whether or not an institution has an "arrangement by which a student completes part of the college program studying in another country" (IPEDS 2008). *Weekend Classes* is a dichotomous variable that describes whether or not an institution has "a program that allows students to take a complete course of study and attend classes only on weekends or only in the evenings" (IPEDS 2008). *Per Capita Academic Support* is the log transformation of a variable created from the quotient of the total dollars spent on "activities and services that support the institution's primary missions of instruction, research, and public service" and the total number of students enrolled at an institution (IPEDS 2008).

Summary statistics for the variables operationalizing an institution's support for student commitment to educational goals is listed in Table 2.14.

Table 2.14 : Support for Students' Commitment to Educational Goals					
Variable	N	Mean	Std. Dev.	Min	Max
Distance Learning	2498	0.692	0.462	0	1
Study Abroad	2498	0.607	0.489	0	1
Weekend Classes	2498	0.447	0.497	0	1
Per Capita Academic Support (log)	2369	7.129	2.040	-8.490027	12.2575

Among four-year institutions in the United States, about 70% have a distance learning program, nearly 61% have study abroad opportunities, and about 45% have weekend classes. The mean per capita amount spent on academic support at institutions is about $2,897. This analysis uses a logarithmic transformation of the variable *Per Capita Academic Support* because the original variable is positively skewed.

Opportunities for Students' Academic and Social Integration. Academic and social integration have been the longest studied contributors to student graduation at colleges and universities, yet few studies have examined integration variables from an institutional perspective. At the student level, integration variables included behaviors and activities in which a student might engage that would increase his or her integration into the college. At the institutional level, I looked for variables that demonstrated opportunities for the student to engage in integrating behaviors. The variable, *ROTC*, is a dichotomous variable that describes the presence of a Reserve Officer Training Corps (ROTC) on an institution's campus. ROTC is a program that provides leadership training for the armed forces while allowing students to complete their education. College graduates are commissioned to serve as officers in active, reserve, or guard components of each branch. *Employment Services* is a dichotomous variable that represents whether or not an institution has "activities intended to assist students in obtaining part-time employment as a means of defraying part of the cost of their education" (IPEDS 2008). *Placement Services* is a dichotomous variable that represents whether or not an institution has

"assistance for students in evaluating their career alternatives and in obtaining full-time employment upon leaving the institution" (IPEDS 2008). *Per Capita Student Services* is log transformation of the quotient of the,

> salaries and wages are amounts paid as compensation for services to all employees - faculty, staff, part time, full time, regular employees, and student employees of admissions, registrar activities, and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program and the total number of students enrolled at an institution.(IPEDS 2008).

Summary statistics for the institution's opportunities for students' academic and social integration are listed in Table 2.15.

Table 2.15: Opportunities for Students' Social and Academic Integration					
Variable	N	Mean	Std. Dev.	Min	Max
ROTC	2498	0.379	0.485	0	1
Employment Services	2502	0.848	0.358	0	1
Placement Services	2502	0.794	0.405	0	1
Per Capita Student Services (log)	1874	6.968	1.714	-9.866	10.573

About 37.9% of schools had a ROTC program, 84.9% of schools had employment services, and 79.3% of schools had placement services for students. The mean of *Per Capita Student Services* is $1,968. This variable is logarithmically transformed because the original variable is positively skewed.

Racial Composition of Campus. An institution's racial campus climate has been extensively studied as a contributor to student retention at the student level, but the concept is harder to grasp at the institutional level. In this study, I argue that one of the ways students perceive a positive campus climate is when they see themselves reflected in a sizable proportion of the campus' demographic. The racial composition of campus variables (*Percent Black Students, Percent Hispanic Students, Percent White and Asian Students)* will include the number of enrolled students who reported being black, Hispanic, or white.

Table 2.16 describes the racial campus climate at the institutions in the sample.

Table 2.16: Racial Composition of Campus					
Variable	N	Mean	Std. Dev.	Min	Max
Percent Black Students	2365	13.402	19.670	0	100
Percent Hispanic Students	2365	6.510	10.838	0	95
Percent White and Asian Students	2365	67.893	24.339	0	100

On average, institutions were comprised of about 13.40% black students, 6.51% Hispanic students, and 63% white and Asian students.

Financial Characteristics. Previous research at the student level of analysis has determined that students' perceptions of their own financial security plays a major role in their decision to continue enrollment at their institution. At the institutional level, I argue that the financial characteristics of an institution can be integral in shaping student perceptions. The variables used to operationalized this concept describe the degree to which an institution is able to provide financial support for its students.

Percent Financial Aid is a variable that reflects the percentage of students receiving any form of financial aid at an institution. Financial aid is defined as

> federal Work Study, grants, loans to students (government and/or private), assistantships, scholarships, fellowships, tuition waivers, tuition discounts, veteran's benefits, employer aid (tuition reimbursement) and other monies (other than from relatives/friends) provided to students to meet expenses (IPEDS 2008).

Percent Pell Grant refers to the percentage of students receiving a Pell Grant at the institution. Pell Grants were established under the Higher Education Act of 1965 and provide "grant assistance to eligible undergraduate postsecondary students with demonstrated financial need to help meet education expenses" (IPEDS 2008). *Average Pell Grant* reflects the average dollar amount given to students receiving Pell Grants at an institution. *Percent Financial Aid, Percent Pell Grants,* and *Average Pell Grant* are determined by federal criteria for

financial aid need. *Percent Institutional Grant Aid* and *Average Institutional Grant Aid* are variables measuring ,

> Scholarships and fellowships granted and funded by the institution and/or individual departments within the institution, (i.e., instruction, research, public service) that may contribute indirectly to the enhancement of these programs . Includes scholarships targeted to certain individuals (e.g., based on state of residence, major field of study, athletic team participation) for which the institution designates the recipient (IPEDS 2008).

The variables, *Percent Loan Aid* and *Average Loan Aid*, describe the number of students receiving loans to pay for their education and the degree to which students are in debt because of their education. The types of loans in these variables are defined as, "Any monies that must be repaid to the lending institution for which the student is the designated borrower. Includes all Title IV subsidized and unsubsidized loans and all institutionally- and privately-sponsored loans" (IPEDS 2008). The variable, *Per Capita Endowment*, is the log transformation of the quotient of an institution's "gross investments of endowment funds, term endowment funds, and funds functioning as endowment for the institution and any of its foundations and other affiliated organizations" at the beginning of the fiscal year and the total number of students enrolled at an institution (IPEDS 2009).

Table 2.17 displays summary statistics for variables that describe the financial characteristics of an institution.

Table 2.17: Financial Characteristics of Institution					
Variable	N	Mean	Std. Dev.	Min	Max
Percent Financial Aid	2317	84.541	18.537	0	100
Percent Pell Grant	2317	35.829	20.755	0	100
Average Pell Grant	2253	2873.356	592.542	249	4551
Percent Institutional Grant	2317	52.075	35.460	0	100
Average Institutional Grant	2106	6290.932	5733.601	30	34103
Percent Loan Aid	2317	60.415	25.598	0	100
Average Loan Aid	2202	6105.204	2486.655	557	29747
Per Capita Endowment (log)	1696	8.575	2.704	-9.774	14.589

About 85% of students in this sample receive some type of financial aid at their institutions. About 36% of the students receive Pell grants and the average amount of Pell grants is about $2,873. About 52% of students receive institutional grant aid, and the average grant aid is about $6,290. More than 60% of students receive student loans and the average amount of student loans is $6,105. School endowment is also an important financial characteristic. In this sample, the mean per capita endowment was $39,851. The analysis uses a logarithmic transformation of the *Per Capita Endowment* variable because the original variable is positively skewed.

Control Variables. Control variables for Hypothesis 3 will allow me to add context to each of the regression model's results. Geographic region will be included in the model as a group of dummy variables including: *New England* (CT,ME,NH, RI, VT,MA), *Mideast* (DC,MD, NJ, NY, PA), *GreatLakes (*IL, IN, MI, OH, WI), *Plains* (LA, KS, MN, MO, NE, ND, SD), *Southeast* (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV), *Southwest* (AZ, NM, OK, TX), *Rocky Mountains* (CO, ID, MT, UT, WY) and *Far West* (AK, CA, HI, NV, WA). *Outlying Areas* (AS, FM, GU, MH, MP, PR, PW, VI) are omitted from this study. The control of an institution is represented by the dichotomous variable, *Public*. All public schools are coded "1" and all private schools are coded "0." This variable is included so that I may investigate if graduation rates differ between public and private schools. The location of a school is represented by a series of dichotomous variables: *City, Suburb, Town,* and *Rural.* The original variable, *Urban*, is coded

using three characteristics for each category of city (large, midsize, small), suburb (large, midsize, small), town (fringe, distant, remote), and rural (fringe, distant, remote). These characteristics were conflated to make the four categories listed above. In the analysis, the *Town* variable is used as the comparison. *Cost In-State* and *Cost Out-Of-State* are variables that reflects "a single fixed amount of money charged by an institution that covers tuition, required fees, room, and board" (IPEDS 2008). *Books and Supplies* is a variable measuring "the average cost of books and supplies for a typical student for an entire academic year (or program). Does not include unusual costs for special groups of students (e.g., engineering or art majors), unless they constitute the majority of students at an institution" (IPEDS 2008). *Institutional Size* is a variable that describes the number of enrolled students at an institution. This variable have five characteristics that specify schools with under 1,000 students (1), 1,000-4,999 students (2), 5,000- 9,999 students (3), 10,000-19,999 students (4), and 20,000 and above students (5).

This set of control variable included in the analysis help provide some context for understanding results from the regression tables.

Table 2.18 displays summary statistics for the control variables used in the analysis.

Table 2.18: Control Variables					
Variable	N	Mean	Std. Dev.	Min	Max
New England	2548	0.073	0.260	0	1
Mideast	2548	0.172	0.377	0	1
Great Lakes	2548	0.153	0.359	0	1
Plains	2548	0.114	0.318	0	1
Southeast	2548	0.251	0.433	0	1
Southwest	2548	0.808	0.272	0	1
Rocky mountains	2548	0.038	0.192	0	1
Far West	2548	0.117	0.322	0	1
Public	2548	0.270	0.444	0	1
City	2548	0.502	0.500	0	1
Suburb	2548	0.234	0.423	0	1
Town	2548	0.155	0.361	0	1
Rural	2548	0.108	0.310	0	1
Cost In-State	2470	16005.29	9645.767	0	65711
Cost Out-of-State	2470	18295.11	8360.183	0	65711
Books and Supplies	2387	1097.881	632.383	0	9072
Institutional Size	2497	2.122	1.145	1	5

About 7.3% of schools in the sample are located in New England, 17.1% are in the Mid-East, 15.3% are in the Great Lakes region, 11.4% in the Plains region, 25.1% are in the Southeast, 8.1% are in the Southwest, 3.8% are the Rocky Mountains, and 11.8% are in the Far West. In the analysis, the New England schools dummy variable is omitted from the model so that New England schools represent the comparison group. About 27% of schools in the sample are public. About half of the schools are located in a city, 23.4% are located in a suburb, 15.5% are located in a town, and 10.89% are in a rural locale. In the model, schools located in towns are omitted from the model and used as the comparison group. The average total cost for in-state students is $16,005 and it is $18,295 for out-of-state students. The mean cost of books and supplies is about $1,097 per year. Most schools in the IPEDS have between 1,000 students and 9,999 students.

Analysis Plan for Hypothesis 3 and 4 Models

For Hypothesis 3 and 4, I take a similar approach to the investigation of Hypotheses 1 and 2; concepts from the literature are regressed on the total institutional graduation rate. Multivariate OLS regression is an appropriate technique for this study because it allows me to examine the impact of various independent variables on aggregate graduation rates while holding the other variables in the model constant. The final regression equation in Part 2 of this study includes all of the institutional characteristics variables from all concepts. In Hypothesis 4, the same set of variables is regressed on the black graduation

rate, Hispanic graduation rate, and white and Asian graduation rate. Z-scores are calculated to determine if there are racial differences in the impact of institutional characteristics on graduation rates.

In summary, a student's graduation status is the outcome variable for the multilevel analysis. I fit a separate model for each concept related to the four college experiences investigated (commitment to educational goals, social and academic integration, perceptions of financial security, and perceptions of racial campus climate). Race/ ethnicity variables are included in all models that estimate Hypotheses 1 and 2. Hypotheses 3 and 4 uses four distinct outcome variables all related to student graduation at the aggregate level. The independent variables explored in Hypothesis 3 are derived from concepts similar to the ones used in Hypotheses 1 and 2. The analyses performed in this study aim to test its hypotheses and answer its research questions. Although Part 1 and Part 2 of the study are conceptually related, use similar variables, and follow a similar plan of analysis, they are not statistically related. The next two chapters report findings from the hypotheses.

CHAPTER 3

THE EFFECT OF STUDENT EXPERIENCES ON A STUDENT'S COLLEGE GRADUATION STATUS: FINDINGS FROM HYPOTHESES 1 AND 2

This chapter reports the major findings from the following hypotheses:

H_1: There is an association between student experiences (commitment to educational goals, social and academic integration, racial campus climate, perceptions of financial security) and degree completion status.

H_2: The association between student experiences and degree completion status is moderated by race/ethnicity.

Before beginning data analysis, I cleaned the National Longitudinal Survey of Freshmen (NLSF) dataset by visually inspecting the data grid, recoding the data so that all of the numeric responses corresponded with the appropriate descriptive responses, and inspecting the data for abnormalities using frequency distributions. Establishing rules for how missing data would be handled was another important consideration in the data cleaning process. In the NLSF data, students who are missing a significant number of responses of items used in the study or who did not respond to the item used to create the dependent variable

are omitted from the sample. Bivariate correlation coefficients are obtained for all the variables in the NLSF data.

Description of NLSF Sample

A subset of participants from the NLSF is used to test Hypothesis 1 and Hypothesis 2. In the original dataset, there are 3,924 participants from 28 elite colleges and universities in the United States. After the data are cleaned, 3,914 (99.7%) participants from all 28 schools remained in the study sample. About 27% of students in the sample are black, 23% are Hispanic, and 49% of students are either white or Asian. About 58% of respondents in the NLSF are female and 42% of respondents are male. Before testing the student experiences concepts, it is important to consider the effect of pre-college characteristics on student graduation status. This relationship, well established in the college retention and graduation literature, sets the foundation for examining the student experiences concepts. Although not a multilevel technique, Table 3.1, displays comparisons of the primary dependent variable (college graduation status) by some key student pre-college characteristics.

Table 3.1: College Graduation Status by Pre-College Characteristics				
	Non Graduates	Graduates	Total	*X2*
All	527	3,387	3,914	
%	13%	87%	100%	
Black	217	834	1,051	63.61***
%	21%	79%	100%	
Hispanic	128	787	915	0.282
%	14%	86%	100%	
White/Asian	182	1,766	1,948	56.54***
%	9%	91%	100%	
Wealthy	210	1,733	1,943	23.26***
%	11%	89%	100%	
First-Generation	279	2,183	2,462	26.03
%	11%	89%	100%	
Female	276	1,999	2,275	82.42**
%	12%	88%	100%	
AP Classes	432	3,063	3,495	34.14***
%	12%	88%	100%	
				F
Mean High School Preparation	5.911	6.4761	6.4713	15.90***
Mean SAT	1261.505	1329.674	1321.904	49.93***
Mean High School GPA	21.352	22.382	22.420	122.66***

*p<.05, **p<.01, ***p<.001

About 87% of the students in this sample graduated from college. 79% of black students graduated from college, 86% of Hispanic students gradated from college, and 91% of white and Asian student gradated from college. About 89% of both wealthy and first-generation students graduated from college. 88% of both female students and students who have taken at least one AP class graduated from college. Students who graduated from college have mean high school preparation scores more than half a point higher than students who did not graduate from college, on average. The mean SAT score is about 68 points higher for college graduates than non-graduates. Similarly, college graduates' mean high school GPA is about one point higher than non-graduates' GPA. The x^2 analysis in Table 3.1 suggests that there are statistical differences in the graduation status of students with different racial/ethnic, demographic, or academic preparation for college. Statistically significant variables include: *Black, Wealthy, Female, AP classes, High School Preparation, SAT, and High School GPA.*

Table 3.2: Pre-College Characteristics by Race/ Ethnicity					
	Black	Hispanic	White and Asian	Total	X2
Graduates	834	787	1766	3,387	76.62***
%	79%	86%	91%	100	
Wealthy	385	384	1179	1948	198.89***
%	37%	42%	60%	50%	
First-Generation	558	463	1448	2469	162.88***
%	61%	53%	75%	67%	
Female	683	532	1065	2280	34.75***
%	65%	58%	54%	58%	
AP classes	870	813	1822	3505	78.23***
%	83%	89%	93%	89%	
					F
Mean HS Preparation	6.34	6.15	6.54	6.40	6.26***
Mean SAT	1213.90	1290.11	1379.69	1322.01	202.52***
Mean GPA	21.39	22.22	22.70	22.24	105.39***

*p<.05, **p<.01, ***p<.001

Table 3.2 displays comparisons of pre-college characteristics by race/ethnicity. Examining the data in this manner provides some framework for understanding racial and ethnic differences in the same pre-college characteristics that are presumed to be related to college graduation (Hypothesis 1). The x^2 analyses suggest that students from different racial or ethnic backgrounds have varied pre-college characteristics and that some race/ethnicities generally have characteristics that are known to be related to high educational attainment. The majority of black and Hispanic students are not from wealthy families, but the majority of white and Asian students are from wealthy families. The majority of students from all groups are first-generation college students, but a higher percentage of white and Asian students are first-generation compared to black and Hispanic students. The percentage of female students is larger than the percentage of male students for each group. The largest disparity in gender is among black students; there are 315 more black females than black males, 148 more Hispanic females than Hispanic males, and 173 more white and Asian females than males (not shown in Table 3.2). Most students in the sample had taken at least one AP class, however; there is a ten percentage point difference in the percent of black and white and Asian students who have taken an AP class. The majority of students thought that their high school prepared them well for college. White and Asian students felt the most prepared and were followed by black students and Hispanic students. White and Asian students have the highest SAT scores and black students have the lowest

SAT score. Similarly, black students have the lowest high school GPAs and white and Asian students have the highest high school GPAs.

I find statistically significant race/ethnicity differences in all of the pre-college characteristics variables. These differences suggest that white and Asian students are the most financially and academically prepared for college and that black students are the least financially and academically prepared for college. In this study, I argue that pre-college characteristics help define the types of experiences that students will have in college. Evidence of race/ethnic differences in pre-college characteristics suggests that similar race/ethnicity disparities will be also found in students' in-college experiences.

Correlation Matrix

I also obtain Pearson product-moment correlations for the dependent variable, each of the pre-college characteristics variables, and each of the variables from the student experiences concepts. Although correlations do not recognize the nested nature of the NLSF data, the correlation matrix does provide valuable information about the relationship between the predictor variables and college graduation status. Additionally, the correlation matrix identifies linear relationships between the variables that may cause problems with collinearity in the full regression models. The matrix is included as an exploratory part of the analysis and multilevel models are later used to address the non-independent error terms. The correlation matrix for variables analyzed in Part 1 of this study is included in Appendix 2.

Analysis Plan for Hypotheses 1 and 2

Before I begin testing hypotheses to answer the first research question, I re-establish the relationship between pre-college characteristics and college graduation that is discussed in the student retention literature. These characteristics include both demographic variables and variables about a student's high school preparation for college. In addition to replicating relationships already established in the literature, the pre-college characteristics reflect a student's capital for college.

The system of equations in Equations 3.1, 3.2, and 3.3 describe how the independent variables (pre-college characteristics and student experiences), and the dependent variable (college graduation status) fit together to demonstrate the model's multilevel nature (Luke 2004, 10). The "*j*" subscript in the level-1 model shows that a different level-1 model is being estimated for each of the "*j*" level-2 units (institutions). Each institution in the study may have a different likelihood of students graduating from college (B_{0j}) or a different effect of, for example, *High Graduation Importance* on a student's likelihood of graduating from college (B_{1j}). In the level-2 equation, the intercepts and slopes from level-1 become outcomes. B_{1j} is the level-1 slope in level-2 unit *j*, y_{10} is the mean value of the level-1 slope when controlling for any institutional effect. Because the primary focus of Part 1 of this study is student experiences, there are no level-2 predictors estimated in the equations. Additionally, in multilevel modeling with a continuous predictor, random effects are calculated for both level-1 and level-2 equations. However,

this study uses multilevel logistic regression where the dependent variable is dichotomous and there is no error term at the first level of the model because the variance is a function of the population mean (Luke 2004, 57).

The first model, Model 0, does not include any predictors of a student's graduation status.

Equation 3.1: The Unconditional Model

Level 1: Within respondents

$$n_{ij} = \ln\left(\frac{p(overall_{ij} = 1)}{1 - p(overall_{ij} = 1)}\right) = \beta_{0j}$$

Level 2: Between respondents

$$\beta_{0j} = \gamma_{00} + u_{0j} \qquad \text{where } u_{0j} \sim N(0, \tau_{00})$$

Composite model

$$\eta_{ij} = \gamma_{00} + u_{0j}$$

The unconditional model predicts the probability of a student graduating from college, without taking into account any predictors. This base model is important because it predicts college graduation for a student in the population without any other information about the student.

In Model 1 (Equation 3.2), I examine the relationship between the nine student pre-college characteristics and college graduation status. These pre-college characteristics, serving as proxies for student's capital for college, provide the baseline for the study to evaluate how much explanatory power capital has on a student's college graduation status.

Equation 3.2: Graduation Status on Pre-College Characteristics

Level 1:

$$\eta_{ij}=\beta_{oj} + \beta_{1j}Black_{ij} + \beta_{2j}Hispanic_{ij} + \beta_{3j}Wealthy_{ij} + \beta_{4j}First\text{-}Generation_{ij} + \beta_{5j}Female_{ij} + \beta_{6j}High\ School\ Preparation_{ij} + \beta_{7j}High\ School\ GPA_{ij} + \beta_{8j}AP\ Classes_{ij} + \beta_{9j}SAT_{ij}$$

Level 2:

$$\beta_{0j}= \gamma_{00} + u_{0j}$$

$$\beta_{1j}=\gamma_{10} + u_{1j}$$

$$\beta_{2j}=\gamma_{20}$$

$$\beta_{3j}=\gamma_{30}$$

$$\beta_{4j}=\gamma_{40}$$

$$\beta_{5j}=\gamma_{50}$$

$$\beta_{6j}=\gamma_{60}$$

$$\beta_{7j}=\gamma_{70}$$

$$\beta_{8j}=\gamma_{80}$$

$$\beta_{9j}=\gamma_{90}$$

Composite:

$$\eta_{ij}=\gamma_{00} + \gamma_{10}black_{1j} + \gamma_{2j}hispanic_{ij} + \gamma_{3j}wealthy_{ij} + \gamma_{4j}firstgeneration_{ij} + \gamma_{5j}female_{ij}$$

$$+\gamma_{6j}hspreparation_{ij} + \gamma_{7j}hsgpa_{ij} + \gamma_{8j}ap1_{ij} + \gamma_{9j}SAT_{ij} + u_{0j} + u_{1j}$$

Model 2 adds student experiences variables to Model 1 and tests whether or not student experiences mediate the relationship between pre-college characteristics and college graduation status. The student experiences in Model 2 are derived from the literature and are grouped into four concepts: Commitment to Educational Goals, Social and Academic Integration, Perceptions of Racial Campus Climate, and Perception of Financial Security. Each concept is associated with a set of variables. Equation 3.3 provides an example.

Equation 3.3: The Effect of Pre-College Characteristics and Commitment to Educational Goals College Graduation Status

Level 1:

$$\eta_{ij}=\beta_{0j} + \beta_{1j}Black_{ij} + \beta_{2j}Hispanic_{ij} + \beta_{3j}GraduationImportance_{ij} + \beta_{4j}finish1year_{ij} + \beta_{5j}finish2years_{ij} + \beta_{6j}graduatefromcollege_{ij} + \beta_{7j}postgraduatework_{ij} + \beta_{8j}finishgraddegree_{ij} + \beta_{9j}peerhelp_{ij} + \beta_{10j}institutionalhelp_{ij} + \beta_{11j}professionalhelp_{ij} + \beta_{12j}librarylab_{ij}$$

Level 2

$\beta_{0j} = \gamma_{00} + u_{0j}$
$\beta_{1j} = \gamma_{10} + u_{1j}$
$\beta_{2j} = \gamma_{20}$
$\beta_{3j} = \gamma_{30}$
$\beta_{4j} = \gamma_{40}$
$\beta_{5j} = \gamma_{50}$
$\beta_{6j} = \gamma_{60}$
$\beta_{7j} = \gamma_{70}$
$\beta_{8j} = \gamma_{80}$
$\beta_{9j} = \gamma_{90}$
$\beta_{10j} = \gamma_{100j}$
$\beta_{11j} = \gamma_{110\,j}$
$\beta_{12j} = \gamma_{120}$

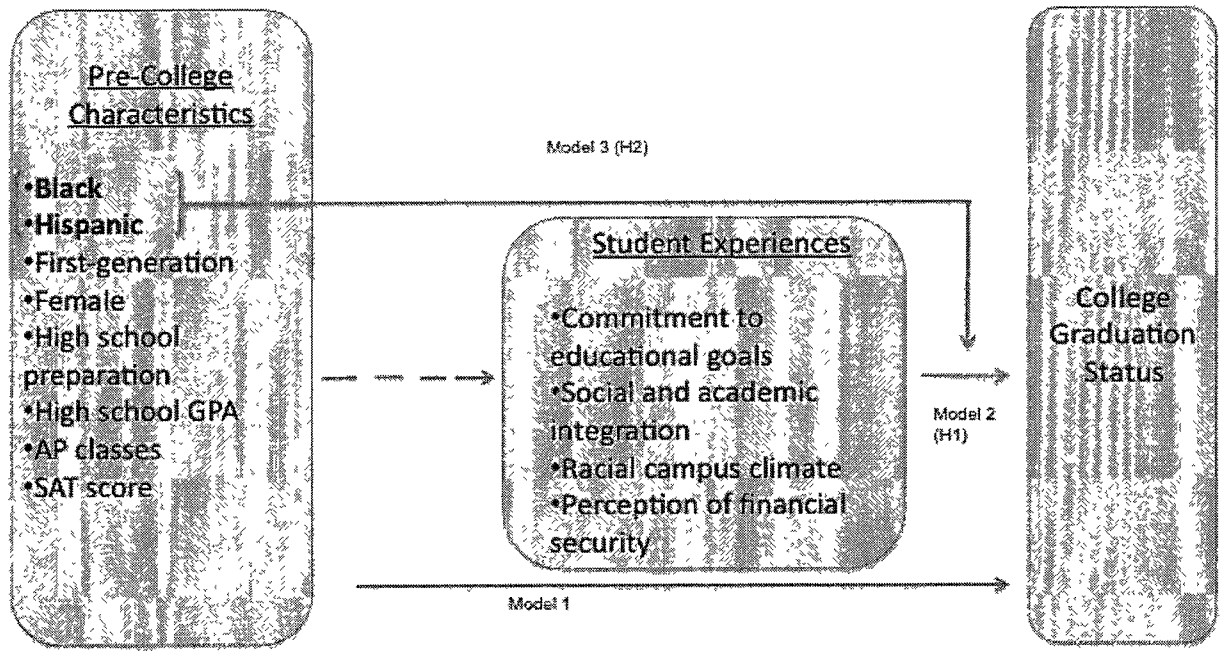
Composite:

$$\eta_{ij} = \gamma_{00} + \gamma_{10}black_{ij} + \gamma_{2j}Hispanice_{ij} + \gamma_{3j}GraduationImportance_{ij} + \gamma_{4j}finish1year_{ij} + \gamma_{5j}finish2years_{ij} + \gamma_{6j}graduatefromcollege_{ij}\ \gamma_{7j}postgraduatework_{ij} + \gamma_{8j}finishgraddegree_{ij} + \gamma_{9j}peerhelp_{ij} + \gamma_{10j}institutionalhelp_{ij} + \gamma_{11j}professionalhelp_{ij} + \gamma_{12j}librarylab_{ij} + u_{0j} + u_{1j}$$

An additional analysis investigates the relationship between pre-college characteristics and student experiences to allow discussion about whether or not a student's background influences the kinds of experiences that are known to influence graduation status. Statistically significant student experiences variables from Model 2 become the dependent variables for the regressions in this analysis, which tests the impact of a student's background on his or her experiences in college. For example, if this study finds that perception of racial campus climate is associated with college graduation (Model 2), does a student's background influence his or her perception of racial campus climate? Finally, Model 3 tests for an either black or Hispanic interaction moderating the effect of student experiences on college graduation status. Interaction terms using both

the black and Hispanic variables and statistically significant student experiences variables from Model 2 are included in Model 3. Figure 3.1 illustrates the conceptual model for Hypothesis 1 and Hypothesis 2.

Figure 3.1: Conceptual Model for Hypothesis 1 and Hypothesis 2



Model 0: Fully unconditional model (no predictors)

Model 1: Relationship between Pre-College Characteristics and College Graduation Status

Model 2: Relationship between Student Experiences and College Graduation Status (H1)

Model 3: Impact of race on relationship between Student Experiences and College Graduation Status (H2)

Hypothesis 1 and 2 Test Results

I fit the multilevel models using the statistical analysis program, Stata Version 10. Coefficients are estimated for both within school (level-1) and between school (level-2) variables. Stata calculates the log odds of (η_{ij}) graduating from college. Next, the model estimates the effect of the level-1 and level-2 predictors on college graduation status. The parameter estimates associated with the predictor variables are antilogged to obtain estimated odds ratios.

For the logistic regression models, the variability in level-1 intercepts is represented by τ_{00}. The statistical significance of τ_{00} is determined by dividing the variance coefficient estimate by its standard error. The variability in level-one intercepts is considered statistically significant if the quotient of the random effects estimate and the standard error is greater than two.

Table 3.4: The Unconditional Model		
N	3914	Predicted Probability
Constant	2.00*** (.117)	88%
Variance	.276 (.100)	

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

The unconditional model reveals that the predicted probability of a student graduating from one of the NLSF colleges is about 88%, without knowing any other information about the student (Table 3.4). The predicted probability is close to the actual percentage of students who graduated from college in the sample (86.54%). The statistic for the variance coefficient is small, but suggests statistically significant variability among schools in the average probability of a student graduating from college. The between school variability, while interesting, is not the focus of Part 1 of this study, but is accounted for in the multilevel modeling technique employed in this analysis. Thus, the level-2 variances are fixed in the subsequent models. The next section begins the exploration of student pre-college experiences and student in-college experiences on college graduation status.

The Effects of Student Experiences on Overall Graduation Status

Each set of regression models is treated as a "nested model" and Model 1 only includes the cases that are also in Model 2. Initially I test for a racial/ethnic interaction effect with all of the student experiences variables from Model 2, but I only include the statistically significant student experiences variables (from Model 2) in the analysis shown because the interactions were not statistically significant. Both versions of Model 3 test for a racial/ethnic interaction because the Pearson's product moment correlation suggested a high correlation between the black and Hispanic variables and the interaction terms made with those variables. Model 3 (version A) presents results using the interaction terms and Model 3 (version B) estimates separate models by race/ethnicity group.

Table 3.5: Regression Results for the Effects of Commitment to Educational Goals on College Graduation Status												
	Model 1		Model 2		Model 3, Version A		Model 3, Version B					
		Odds Ratio		Odds Ratio		Odds Ratio	Black	Odds Ratio	Hispanic	Odds Ratio	White	Odds Ratio
N	2232		2232		2232		466		495		1271	
X^2	82.39***		149.97***		142.45***		39.60***		18.55*		74.91***	
Black	-.736*** (.191)	.479	-.714*** (.203)	.490	-.853* (.414)	.427						
Hispanic	-.133 (.197)	.875	-.165 (.203)	.848	.336 (.452)	1.398						
Wealthy	.268 (.155)	1.307	.267 (.160)	1.306	.252 (.159)	1.287	.647* (.282)	1.908	-.171 (.331)	.843	.077 (.244)	1.080
First-Generation	.273 (.158)	1.314	.340* (.164)	1.405	.309 (.163)	1.361	.221 (.272)	1.246	.382 (.328)	1.465	.220 (.270)	1.246
Female	.247 (.152)	1.280	.223 (.158)	1.050	.207 (.156)	1.230	.376 (.266)	1.455	.520 (.320)	1.682	-.070 (.244)	0.932
High School Preparation	.057* (.025)	1.059	.050 (.026)	1.050	.053* (.026)	1.058	.050 (.044)	1.050	-.028 (.056)	0.972	.091* (.040)	1.095
High School GPA	.169*** (.039)	1.184	.157*** (.040)	1.170	.146*** (.040)	1.156	.173* (.067)	1.189	.082 (.082)	1.085	.164** (.062)	1.150
AP Classes	.447* (.232)	1.564	.512* (.239)	1.669	.542* (.236)	1.718	.356 (.360)	1.428	-.057 (.541)	.945	1.237*** (.385)	3.421
SAT	.001 (.000)	1.001	.000 (.001)	1.001	.000 (.001)	1.000	.000 (.001)	1.000	.002* (.001)	1.002	.000 (.001)	1.000
High Graduation Importance			1.660*** (.191)	5.259	1.71*** (.250)	5.529	1.652*** (.371)	5.207	1.651* (.436)	5.207	1.758*** (.256)	5.755
Finish 1 Year College			-.533 (.444)	.587								
Finish 2 Years College			.068 (.166)	1.069								
Likelihood of Graduating from College			.030 (.106)	1.029								
Likelihood of Post Graduation Work			-.090 (.081)	.915								
Likelihood of Finishing Graduate Degree			.013	1.013								

			(0.076)									
Peer Help			.026 (.040)	1.294								
Institutional Help			-.095 (.064)	.388								
Professorial Help			-.036 (.045)	.965								
Library Lab			-.013 (.041)	.988								
Black High Grad Importance					.005 (.447)	1.004						
Hispanic High Grad Importance					-.682 (.498)	.506						
Constant	-2.73** (1.02)		1.290 (4.218)		-3.923*** (1.047)		-5.123*** (1.554)		-4.096* (2.002)		-4.433** (1.667)	
Variance	.144 (.090)		1.290 (4.218)		.107 (.075)		.028 (.115)		(.014) (.144)		.098 (.175)	

Model 1

Model 1 examines the impact of student's pre-college characteristics on his or her college graduation status (Table 3.5). In this model, the variables *Black, High School Preparation, High School GPA,* and *AP Classes* are all statistically significant predictors of whether or not a student graduates from college. The predicted odds of graduating from college are nearly 52% lower for black students than for non-black students. For each additional degree of a student's assessment of his or her high school preparation for college, the predicted odds of the student graduating from college increases by about 6%. For each additional one-unit increase in high school GPA, the predicted odds of a student graduating from college increases by 18%. Students who take advanced placement classes are about 56% more likely to graduate from college than students who did not take an advanced placement classes.

Model 2

Model 2 adds the Commitment to Educational Goals variables and addresses two questions (Table 3.5). First, are the effects of pre-college characteristics mediated by commitment to educational goals? Second, are there effects of Commitment to Educational Goals variables controlling for pre-college characteristics?

In Model 2, the odds of a black student graduating from college are about 51% lower than the odds of a non-black student graduating from college and are statistically significant. The odds of first-generation students graduating from

college are higher than the odds of non-first generation students graduating from college. In Model 1, these odds are 31% higher for first-generation students but they are not statistically significant. In Model 2, the odds increase to 41% higher for first-generation students compared to non first-generation students and are statistically significant. In Model 1, for each additional unit increase in how well a student thinks that high school prepared him or her for college the odds of graduating from college increase by about 6% and are statistically significant. The high school preparation variable loses its statistical significance in Model 2, but continues to have a positive relationship with college graduation status.

Model 1 shows that for each one-unit increase in *High School GPA*, the odds of a student graduating from college also increase by about 18%. In Model 2, these odds drop to being 17% higher for every one-unit increase in *High School GPA*. The odds of a student graduating from college who took at least one AP class increase between Model 1 and Model 2; the odds in both models are statistically significant. In Model 2, if a student took at least one advanced placement class, the odds of he or she graduating from college is about 54% higher than those of a student who did not take at least one AP class. The only statistically significant Commitment to Educational Goals variable is *High Graduation Importance*. The odds of graduation among students who report high graduation importance are more than five times higher for students who do not report high graduation importance.

Table 3.6: Regression Results for the Effects of Pre-College Characteristics on High Graduation Importance		
N	2232	
X^2	27.54	
	B	Odds Ratio
Black	.327 (.220)	1.387
Hispanic	.390 (.203)	1.477
Wealthy	.120 (.156)	1.127
First-generation	-.106 (.173)	.899
Female	.273 (.153)	1.314
High School Preparation	.027 (.026)	1.027
High School GPA	.159*** (.041)	1.172***
AP Classes	-.239 (.310)	.787
SAT	-.001 (.000)	1.000
Constant	-.704 (1.11)	
Variance	.142 (.090)	

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Although not a formal hypothesis, I also examine the impact of pre-college characteristics on the one statistically significant Commitment to Educational Goals Variable from Model 2, *High Graduation Importance* (Table 3.6). I test the impact of pre-college characteristics on high graduation importance to determine if capital plays a role in influencing whether or not students reported high graduation importance. Only one of the pre-college characteristics variables had a statistically significant relationship with high graduation importance. For every one-point increase in *High School GPA*, the odds of a student reporting that graduating from college was of highest priority increases by 17%. This finding suggests that most pre-college characteristics may not play a major role in predicting college experiences.

Model 3 (Version A and Version B)

Model 3 (Table 3.5) includes interaction terms to test if the effect of high graduation importance differs for black, Hispanic, and white/Asian students. In this model, the odds of a black student graduating from college who does not report high graduation importance is about 57% lower than the odds of a non black student graduating from college. For each one-unit increase in reported high school preparation, the odds of a student graduating from college increase by about 5.3%. *High School GPA* is also associated with an increase in odds of college graduation. For each one-unit increase in *High School GPA*, the odds of a student graduating from college increases by about 15.6%. The odds of a

student graduating from college who took at least one advanced placement class are more than 70% higher than the odds of a student graduating from college who did not take at least one advanced placement class. Although the odds ratios for both *Black* and *High Graduation Importance* are statistically significant, their interaction is not. Furthermore, neither Hispanic nor *Hispanic*High Graduation Importance* are statistically significant. Not finding statistically significant interactions between the race/ethnicity terms and high graduation importance suggest that collinearity may be an issue. Pearson's product-moment correlations (Appendix 1) reveal that the variables *Black* and *Black*High Graduation Importance* are highly correlated (r=.94).

To check for additional evidence of an interaction and to solve collinearity problems, I test separate models for black, Hispanic, and white and Asian students and compare the odds ratios for high graduation importance in Model 4. For both black and Hispanic students, the odds of graduation importance are about 5.21 times higher for students who reported *High Graduation Importance* compared to students who did not report *High Graduation Importance*. The odds of graduation are about 5.76 times higher for white and Asian students who reported *High Graduation Importance* compared to students who did not report high graduation importance. It does appear that the effect of high graduation importance is greater for white and Asian students than for either black or Hispanic students, but the odds of graduation for the groups only differ by .54. I conclude that there is not a statistical interaction between race/ethnicity and *High Graduation Importance*.

Social and Academic Integration

The next set of models test the impact of *Social and Academic Integration* variables on student graduation status. Model 1 estimates the influence of pre-college characteristics on graduation status. Model 2 adds ten integration variables to Model 1 . Model 3 tests for a racial or ethnic interaction with the *Social and Academic Integration* variables.

Table 3.7: Regression Results for the Effects of Social and Academic Integration on College Graduation Status						
	Model 1		Model 2		Model 3	
N	1944		1944		1944	
X^2	54.93***		69.4***		60.19***	
	B	Odds Ratio	*B*	Odds Ratio	*b*	Odds Ratio
Black	-.734*** (.228)	.479	-.814*** (.236)	.443	-.692* (.289)	.500
Hispanic	-.152 (.233)	.858	-.163 (.237)	.850	-.069 (.322)	.933
Wealthy	.149 (.183)	1.160	.201 (.188)	1.223	.178 (.184)	1.194
First-Generation	.425* (.182)	1.529	.441* (.191)	1.554	.444* (.189)	1.558
Female	.107 (.029)	1.112	.094 (.189)	1.099	.072 (.184)	1.074
High School Preparation	.069* (.045)	1.071	.067* (.030)	1.069	.069*** (.029)	1.071
High School GPA	.192*** (.280)	1.211	.172*** (.048)	1.187	.181* (.046)	1.198
AP Classes	.455 (.000)	1.573	.464 (.285)	1.590	.448 (.282)	1.565
SAT	.000 (.001)	1	-.001 (.001)	.999	.000 (.000)	1
Mentor			.070 (.183)	1.073		
Extracurricular			.058 (.100)	1.059		
In class			.005 (.011)	1.005		
Studying			.002 (.008)	1.002		
Activities			.020 (.012)	1.020		
Television			-.012 (.015)	.988		
Working			.007 (.014)	1.007		
Partying			-.049* (.020)	.952	-.035 (.024)	.965
Sleeping			.004 (.009)	1.004		
On campus			.295 (.440)	1.342		

Black*partying					-.027 (.047)	.973
Hispanic*partying					-.014 (.046)	.986
Constant	-1.750 (1.200)		-1.670 (1.405)		-1.150 (1.240)	
Variance	.099 (.090)		.117 (.100)		.113 (.095)	

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Model 1

The variables *Black, First-Generation, High School Preparation, and High School GPA* are statistically significant (Table 3.7). The odds of first-generation students graduating from college are 53% higher than for non first-generation. For every one-unit increase in high school preparation, the odds of graduating from college increase by about 7%. For every one-unit increase *High School GPA*, the odds of graduating increase by 21%.

Model 2

Model 2 tests the effect of Social and Academic Integration on college graduation status (Table 3.7). It asks if the Social and Academic Integration variables mediate the relationship between pre-college characteristics and college graduation status. In Model 2, the predicted odds of black students graduating for college are about 56% lower than the predicted odds of non-black students graduating from college. This is a four percentage point decrease in odds (from Model 1) and suggests that the Social and Academic Integration variables do mediate the relationship between *Black* and college graduation status. The predicted odds of first-generation students graduating from college are about 55% higher than the predicted odds of non first-generation students graduating from college. For every one-unit increase in student's perception of high school preparation for college, the predicted odds of a student graduating from college increases by nearly 7%. Similarly, for every one-unit increase in

high school GPA, the predicted odds of a student graduating from college increases by about 19%. The only statistically significant social and academic integration variable is partying, which negatively predicts a student's college gradation status. For every additional hour during the week that a student spent partying, his or her predicted odds of graduating from college decreases by 4.8%. The mediating effects of Social and Academic integration on college graduation are weak, at best. The only integration variable that has a statistically significant effect is the number of hours during the week spent partying, which decreases a student's odds of graduating from college.

I also investigate the relationship between pre-college characteristics and partying. This model asks if a student's background is related to how often they report partying during the week (Table 3.8).

Table 3.8: Regression Results for the Effect of Pre-College Characteristics on the Number of Hours During the Week Spent Partying	
N	1944
X^2	72.36***
Black	-1.08*** (.259)
Hispanic	.397 (.234)
Wealthy	.508** (.189)
First Generation	.645** (.205)
Female	-.519** (.186)
High School Preparation	-.026 (.032)
High School GPA	-.181*** (.056)
AP Classes	.097 (.362)
SAT	-.002** (.363)
Constant	10.59*** (1.45)
Variance	.408 (.177)
Variance Residual	15.21 (.492)

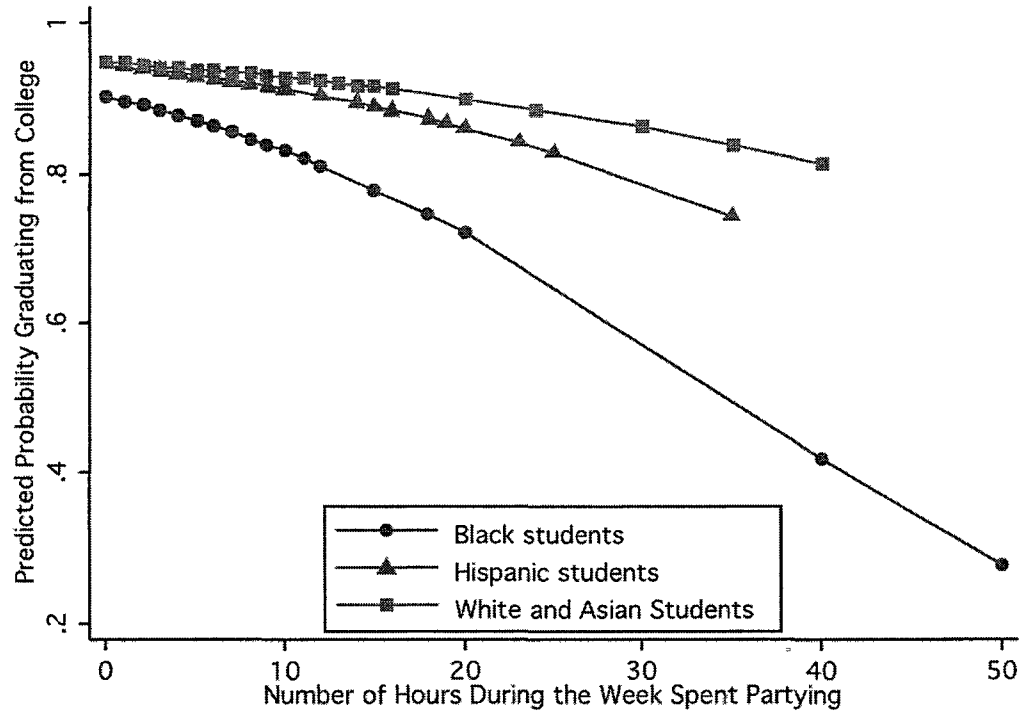
Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Black students spend less time partying during the week (about one hour less) than non-black students. Wealthy students reported about thirty minutes more time partying during the week than non-wealthy students. First-generation students party during the week about .65 hours more than non-first generation students. In contrast, female students party during the week about .52 hours less than male students. An increase in SAT scores is related to a small decrease in the number of hours during the week that a student spends partying.

Model 3

Model 3 (Table 3.7) tests for a racial interaction between a student's partying during the week and his or her college graduation status. In Model 3, the statistically significant odds of black students graduating from college are about 50% lower than the odds of non-black students graduating from college. The odds of first-generation students graduating from college are nearly 56% higher than the odds of non first- generation students graduating from college. Both *High School Preparation* and *High School GPA* are positive statistically significant predictors of college graduation. For each additional unit of reported high school preparation, the odds of a student graduating from college increased by about 7%. For each one-unit increase in high school GPA, the odds of a student graduating from college increased by nearly 20%. None of the variables *Partying*, *Black Partying*, or *Hispanic Partying* had a statistically significant relationship with college graduation.

Figure 3.2: Conditional Effect Plot of the Probability of Graduation Status by Hours Spent Partying During the Week



Despite the lack of a significant interaction, the coefficients in Table 3.7 suggests that there may be racial differences in the effect of partying on college graduation. Figure 3.2 depicts an interpretation of Model 3 and reveals the nature of the relationship between race/ethnicity, partying, and graduation status while holding all of the other variables in the model constant at their mean. The odds of a non-black student graduating from college are multiplied by -.035 for each additional hour of partying during the week, the odds for a black students graduating are multiplied by 0 (-.035 x -.027), and the odds of a Hispanic student graduating from college are multiplied by 0 (-.035 x -.014). In terms of percentage decrease in estimated odds, the predicted odds of white or Asian students graduating from college decrease by .035% for each additional hour of partying. However, the number of hours spent partying during the week impacts the odds of black students graduating from college or the odds of a Hispanic student graduating from college even less. These findings suggest that neither race nor ethnicity moderates the relationship between partying and college graduation; the odds are slightly decreased for white and Asian students and they are not statistically significant.

Racial Campus Climate

The next model estimates the effects of a student's perception of racial campus climate on college graduation. Twelve racial campus variables are added to the pre-college characteristics.

Table 3.9: Regression Results for the Effects of Perception of Racial Campus Climate on Graduation Status				
	Model 1		Model 2	
N	1932		1932	
X^2	55.51***		62.97***	
	B	Odds Ratio	*B*	Odds Ratio
Black	-.694** (.227)	.499	-.682** (.237)	.505
Hispanic	-.186 (.228)	.830	-.189 (.230)	.827
Wealthy	.155 (.182)	1.167	.138 (.183)	1.147
First Generation	.524** (.185)	1.688	.510** (.187)	1.665
Female	.100 (.180)	1.105	.074 (.184)	1.076
High School Preparation	.056 (.029)	1.057	.048 (.030)	1.049
High School GPA	.186*** (.045)	1.204	.191*** (.046)	1.210
AP Classes	.460 (.278)	1.584	.500 (.282)	1.648
SAT	-.001 (.001)	.999	-.001 (.001)	.999
High Racial Separation			.307 (.187)	1.359
Uncomfortable			-.105 (.177)	.900
Requested ID			-.056 (.121)	.945
Students Derogatory Remarks			-.086 (.113)	.917
Professors Derogatory Remarks			-.108 (.223)	.897
Harassment			.091 (.185)	1.095
Harassment Same Race			-.058 (.130)	.943

Bad Grade Race			-.083 (.220)	.920
Discourage Speaking			-.007 (.274)	.993
Discourage Course			.019 (.145)	1.019
Professors of Color			.082 (.063)	1.085
Students of Color			-.006 (.004)	.994
Constant	-1.777 (1.181)		-1.453 (1.245)	
Variance	.119 (.090)		.086 (.083)	

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Model 1

The odds of black students graduating from college are about 50% lower than the odds of non-black students graduating from college (Table 3.9). The odds of first-generation students graduating from college are about 69% higher than the odds of non-first generation students. For each additional point in *High School GPA*, the statistically significant odds of a student graduating from college increase by about 20%.

Model 2:

Model 2 examines the effects of the Racial Campus Climate variables on college graduation status (Table 3.9). The odds of a black student graduating from college are lower than the odds of a non-black student graduating from college in both Model 1 and in Model 2. When the racial campus climate variables are added to Model 1, the odds of a black student graduating from college increase slightly. The odds of first-generation students graduating from college are higher than the odds of non first-generation students graduating from college in both Model 1 and in Model 2. Between Model 1 and Model 2, these odds decrease from 69% higher to 67% higher and are statistically significant in Model 2. For each additional point of *High School GPA*, the odds of a student graduating from college increase in both Model 1 and in Model 2. These odds are slightly higher in Model 2 than in Model 1, a one-unit increase in high school grade point average is associated with a 21% increase in the odds of college graduation.

Although none of the Racial Campus Climate variables have statistically significant odds ratios, they do suggest some interesting relationships. Students who reported a high level of racial separation on campus have increased odds of graduating from college. *Harassment* and *Discouraged Course* because of race were also associated with small increases in the odds of college graduation. The other variables, feeling *Uncomfortable*, *Requested ID*, *Professors Derogatory, Students Derogatory, Harassment Same Race*, and *Bad Grade Race* are all associated with small decreases in odds of graduating from college. While an increase in *Professors of Color* increases the odds of graduating from college, an increase in *Students of Color* in decreases the odds of graduating from college.

Perceptions of Financial Security

Table 3.10 displays the effect of Perceptions of Financial Security on college graduation status. Four Perceptions of Financial Security variables are added to the pre-college characteristic variables.

Table 3.10: Regression Results for the Effects of Perceptions of Financial Security on College Graduation Status				
	Model 1		Model 2	
N	2223		2223	
X^2	83.16***		88.14***	
	b	Odds Ratio	*B*	Odds Ratio
Black	-.727*** (.173)	.483	-.587** (.197)	.556
Hispanic	-.189 (.184)	.827	-.112 (.191)	.894
Wealthy	.306* (.150)	1.358	.178 (.170)	1.194
First-Generation	.232 (.152)	1.262	.180 (.156)	1.198
Female	.273 (.145)	1.314	.269 (.148)	1.309
High School Preparation	.058* (.024)	1.059	.054* (.025)	1.055
High School GPA	.174*** (.037)	1.190	.173*** (.038)	1.189
AP Classes	.389 (.226)	1.475	.365 (.229)	1.441
SAT	.000 (.000)	1.000	.000 (.001)	1.000
Aid Problems			-.031 (.025)	.970
Aid Importance			-.019 (.029)	.981
Cost Importance			.031 (.025)	1.032
Parental Contribution ($1,000)			.010 (.008)	1.010
black*Parental Contribution				
Constant	-2.624*** (.861)		-2.975** (1.029)	
Variance	.140 (.082)		.129 (.082)	

*p<.05, **p<.01, ***p<.001
Standard errors in parentheses

Model 1

Black students' odds of graduating from college are nearly 52% lower than non-black students. Wealthy students are about 36% more likely to graduate from college than non-wealthy students. For every one-unit increase in reported high school preparation, the odds of graduating from college increase by about 6% and for every one-unit increase in *High School GPA*, the odds of a student graduating from college increases by about 19%.

Model 2

I test for mediating variables in Model 2 (Table 3.10). The odds of black students graduating from college are lower than non-black students in both Model 1 and in Model 2. When the perceptions of financial security variable are added in Model 2, the odds a black student graduating from college increase from nearly 52% lower to only 44% lower. In both Model 1 and Model 2, an increase in high school preparation is associated with a statistically significant increase in odds of graduating from college. For every one-unit increase in high school GPA, the odds of as student graduating from college increase by about 19% in both Model 1 and in Model 2.

None of the Perceptions of Financial Security variables have a statistically significant relationship with college graduation status. Increases in *Aid Problems* or *Importance of Financial Aid* are associated with small decreases in the odds of a student graduating from college. Alternately, increases in *Cost Importance* is associated with a small increase in the odds of a student graduating from

college. There is a positive relationship between *Parental Contribution* and college graduation status.

Final Model

Table 3.11 uses the student experiences variables from the previous models to estimate the odds of a student graduating from college. Including all variable from each of the concepts provides an additional check that the findings in the previous models are non-spurious.

Table 3.11: Regression Results for the Effects of Pre-College Characteristics and Student Experiences on College Graduation Status		
N	1855	
X^2	125.52***	
	B	Odds Ratio
Black	-.602 (.281)	0.549
Hispanic	-.060 (.269)	0.942
Wealthy	.134 (.234)	1.143
First-Generation	.522* (.215)	1.683
Female	-.062 (.216)	0.940
High School Preparation	.047 (.033)	1.048
High School GPA	.188*** (.053)	1.206
AP Classes	.622* (.319)	1.859
SAT	-.001 (.001)	0.999
High Graduation Importance	1.864*** (.245)	6.413
Finish 1 Year	-.228 (.359)	0.797
Finish 2 Years	.042 (.190)	1.043
Graduate from College	.062 (.139)	1.064
Likelihood of Post Graduation Work	-.116 (.113)	0.891
Finish Graduate Degree	-.050 (.104)	0.951
Peer Help	.019 (.052)	1.019
Institutional Help	-.139 (.084)	0.871
Professorial Help	-.044 (.059)	0.957
Library Lab	.019 (.053)	1.019

Mentor	.120 (.203)	1.127
Extracurricular	.077 (.110)	1.080
In Class	.003 (.012)	1.003
Studying	-.001 (.009)	0.999
Activities	.021 (.013)	1.021
Television	-.011 (.016)	0.989
Working	.016 (.017)	1.016
Partying	-.061** (.022)	0.941
Sleeping	.004 (.010)	1.004
On campus	.354 (.503)	1.423
High racial separation	.219 (.209)	1.244
Uncomfortable Because of Race	-.015 (.200)	0.985
Requested ID	-.023 (.133)	0.977
Students Derogatory Remarks	-.127 (.122)	0.881
Professors Derogatory Remarks	-.249 (.237)	0.780
Harassment	.082 (.203)	1.085
Harassment Same Race	-.107 (.142)	0.899
Bad Grade Race	.150 (.259)	1.161
Discouraged Speaking	-.081 (.302)	0.922
Discouraged Course	.029 (.162)	1.029
Professors of Color	.127 (.075)	1.135
Students of Color	-.004 (.005)	0.996
Aid Problems	-.003 (.036)	0.997

Aid Importance	-.031 (.040)	0.970
Cost Importance	.056 (.034)	1.057
Parental Contribution ($1000)	.019 (.010)	1.019
Constant	-.144 (3.825)	
Variance	.039 (.093)	

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

The final model is estimated with all of the student experiences variables and the pre-college student characteristics variables together. Interestingly, neither *Black* nor *Hispanic* are statistically significant predictors of college graduation suggesting that the combination of student experiences variables mediate the relationship between race/ethnicity and college graduation status. The odds of first-generation students graduating from college are about 68% higher than the odds of non first-generation students graduating from college. For each additional increase in *High School GPA*, the odds of college graduation increase by about 21%. The odds of a student graduating from college who took an AP exam are about 86% higher than the odds of a student who did not take an AP class. Both *High Graduation Importance* and *Partying* maintain their statistical significance. The odds of a student who reported *High Graduation Importance* graduating from college are about 6.41 times higher than the odds of a student who did not report high graduation importance. For every additional hour of partying during the week, the odds of a student graduating from college decrease by about six percent. The findings in the final model indicates that high graduation importance and partying are important predictors of college

graduation. Chapter 5 will discuss why these two variables, in particular, were such important predictors in this study.

Summary of Hypothesis 1 and Hypothesis 2 Findings

The findings support the relationship between pre-college characteristics and college graduation as suggested in the literature. The odds of black and Hispanic students graduating from college are lower than the odds of non-black or non-Hispanic students. Interestingly, Hispanic students have decreased odds on all of the models tested in this study, but the odds are not statistically significant. This finding is unique to the NLSF sample and will be further discussed in Chapter 5. *First-Generation* students had higher predicted odds of graduating from college in this study, although the literature suggests that their odds should be lower than non first-generation students. *High School Preparation*, *High School GPA*, and *Advanced Placement* classes are all related to increased odds of college graduation as the literature describes. *Wealthy*, *Female*, and *SAT* did not have statistically significant relationships with college graduation. The anomalies in this data are likely due to the unique sample of students attending selective college and universities.

There is some support for Hypothesis 1, there is a relationship between student experiences and college graduation status. Of the student experience variables, *High Graduation Importance* and *Partying* are statistically significant predictors of college graduation. The findings do not provide statistical support for Hypothesis 2; the relationship between student experiences and college

graduation status is not moderated by race. *High Graduation Importance* is associated with increased odds of college graduation. I tested also for an interaction between race/ethnicity and high graduation importance. *High Graduation Importance* seems to be slightly more impactful for white and Asian students than for black and Hispanic students, but the interaction is not statistically significant in any of the models. *Partying* is associated with decreased odds of college. I tested for an interaction between race/ethnicity and *Partying*, but the interaction terms were not statistically significant.

There is little variance in the level-one intercepts in any of the models tested and the effect of the level-1 predictors do not significantly vary across schools. This is most likely due to the expected similarity between the selective colleges and universities in the NLSF dataset. Chapter 5 will discuss, in more detail, how both the type of students and kind of institutions in the NLSF may have influenced the findings for Hypotheses 1 and 2.

CHAPTER 4

THE INSTITUTION'S ROLE IN STUDENT GRADUATION: FINDINGS FROM HYPOTHESIS 3 AND HYPOTHESIS 4

Recently, education research has suggested that scholars need to explore the ways in which institutional variables influence college graduation. The previous chapter found that some student experiences increase the probability of a student graduating from college. This chapter extends the discussion to also include the role of institutional characteristics in student graduation. While I do recognize that institutional characteristics cannot (and perhaps should not) be fully isolated from student characteristics, to the extent to which it can, this chapter attempts to examine the independent effects of institutional characteristics. This approach sheds some light on how much institutional characteristics contribute to student retention and establishes the institution as a worthwhile subject of study for future research. The following hypotheses are investigated:

> H_3: Institutional characteristics that reflect students' academic preparation support for students' commitment to educational goals, support for social and academic integration, racial composition of campus, and financial

characteristics of the institution are associated with an institution's graduation rate.

H_4: The effects of institutional characteristics on graduation rates are moderated by race.

Hypothesis 3 and Hypothesis 4 examine institutional characteristics that are conceptually similar to student experiences and behaviors at the individual level. The hypotheses are tested using data from the Integrated Postsecondary Education System (IPEDS). The variables in the IPEDS data are unable to fully describe the same student experiences concepts in Part 1 of the study, but they do provide an approximation of the concepts. Institutions are omitted that are not four-year, degree-granting, or that are located outside of the United States. Additionally, institutions that are missing a significant number of responses for either the independent variables or the dependent variables are dropped. I correlate all of the independent variables from each concept with each other to identify potential problems with collinearity and to identify the potential strength and direction of the regression coefficients in the models (Gall, Borg, & Gall, 1996).

In addition to the variables not being an exact institutional-level measure of the student experiences concepts, the independent variables analyzed in this chapter were all expected to be positive predictors of students' graduation rates. However, preliminary analysis revealed that many of the institutional characteristics are negatively correlated with students' graduation rates. This chapter presents the results from the analysis and begins to explain the surprising relationships.

Description of the IPEDS Sample

2,548 four-year, degree-granting institutions in IPEDS are used to test Hypothesis 3 and Hypothesis 4. The nine schools located in Outlying Areas and schools that are missing graduation data are omitted from the study. Before testing the impact of institutional characteristics on student graduation rates, it is important to consider how the variables are associated with one another. Table 4.1 describes univariate descriptions of the independent variables and college graduation rates.

Table 4.1: Descriptive Statistics for Variables		
Variable		
	Frequency	% or Mean
Dependent Variables		
Total Graduation Rate	2129	50.2
Black Graduation Rate	1827	39.6
Hispanic Graduation Rate	1644	42.9
White and Asian Graduation Rate	2129	45.751
Independent Variables		
Remedial	2502	72%
Mean 75th Percentile SAT Verbal Score	1238	474
Mean 75th Percentile SAT Math Score	1247	478
Distance Learning	2498	69%
Study Abroad	2498	61%
Weekend Classes	2498	45%
Per Capita Academic Support (log)	2369	7.23
ROTC	2498	38%
Employment Services	2502	85%
Placement Services	2502	79%
Per Capita Student Services	1874	7.033
Percent Black Students	2365	15.86
Percent Hispanic Students	2365	12.04
Percent White and Asian Students	2365	63.06
Percent Financial Aid	2317	84.54
Percent Pell Grant	2317	35.83
Average Pell Grant	2253	2873.36
Percent Institutional Grant Aid	2317	52.08
Average Institutional Grant Aid	2106	6290.93
Percent Loan Aid	2317	60.42
Average Loan Aid	2202	6105.20
Per Capita Endowment	1696	8.675

Control Variables		
New England	2548	7%
Mideast	2548	17%
Great Lakes	2548	15%
Plains	2548	12%
Southeast	2548	25%
Southwest	2548	8%
Rocky Mountains	2548	4%
Far West	2548	12%
Public	2548	27%
City	2548	50%
Suburb	2548	23%
Town	2548	16%
Rural	2548	11%
Cost In –State	2470	16005.29
Cost Out-of-state	2470	18295.11
Books and supplies	2387	1097.88
Institutional size	2497	2.12

Descriptive statistics suggests that there are some statistical differences in the Total Graduation Rate and the graduation rates of each race/ethnic group (Table 4.1) For example, there is six-percentage point difference between the Black Graduation Rate and the White and Asian Graduation Rate. The race/ethnicity graduation rates show that white and Asian students have the highest graduation rates and that black students have the lowest graduation rates.

Correlation Matrix

I obtain Pearson product-moment correlations for each of the dependent variables, the Institutional Characteristics concepts, and control variables (Appendix 3). None of the variables are so highly correlated that they are suspected to cause statistical issues in the regression models.

Analysis Plan for Hypothesis 3 and 4

To analyze the associations between institutional characteristics and college graduation rates, I use ordinary least squares (OLS) regression to first predict the effect of institutional characteristics that support student experiences on the total graduation rate and then to predict the effect of institutional characteristics on the black, Hispanic, and white and Asian graduation rates. The concepts included in the analysis for Part 2 of this study mirror the same concepts analyzed at the individual level in Chapter 3. Control variables identifying the region, control, urbanity, cost, and size of the institutions are also included in the model. For each set of independent variables there are two

models- Model 1 examines the effect of the independent variables and Model 2 adds control variables (full regression tables shown in Appendix 4). Equation 4.1 offers an example of Model 1 and Model 2 in Part 2 of this study.

Equation 4.1: The Effect of Racial Composition of Campus on Total Graduation Rate

Model 1: $Total\ Graduation\ Rate = b_0 + b_1 Percent\ Black\ Students_1 + b_2 Percent\ Hispanic\ Students_2 + b_3 Percent\ White\ Asian\ Students_3 + e$

Model 2: $Total\ Graduation\ Rate = b_0 + b_1 Percent\ Black\ Students_1 + b_2 Percent\ Hispanic\ Students_2 + b_3 Percent\ White\ Asian\ Students_3 + b_3 Mideast_4 + b_4 Great\ Lakes_4 + b_5 Plains_5 + b_6 Southeast_6 + b_7 Southwest_7 + b_8 Rocky\ Mountains_8 + b_9 Far\ West_9 + b_{10} Public_{10} + b_{11} City_{11} + b_{12} Suburb_{12} + b_{13} Rural_{13} + b_{14} Cost\ In\text{-}State_{14} + b_{15} Cost\ Out\text{-}of\text{-}State_{15} + b_{16} Books\ and\ Supplies_{16} + b_{17} Institutional\ Size_{17} + e$

Hypothesis 3 is tested using a separate regression model for each of the five institutional characteristics concepts: Reflection of Students' Academic Preparation, Support for Students' Commitment to Educational Goals, Opportunities for Students' Social and Academic Integration, Racial Composition of the Campus, and Financial Characteristics of the Institution. The final set of regression models in Part 2 displays the impact of all the institutional characteristics variables on the total graduation rate.

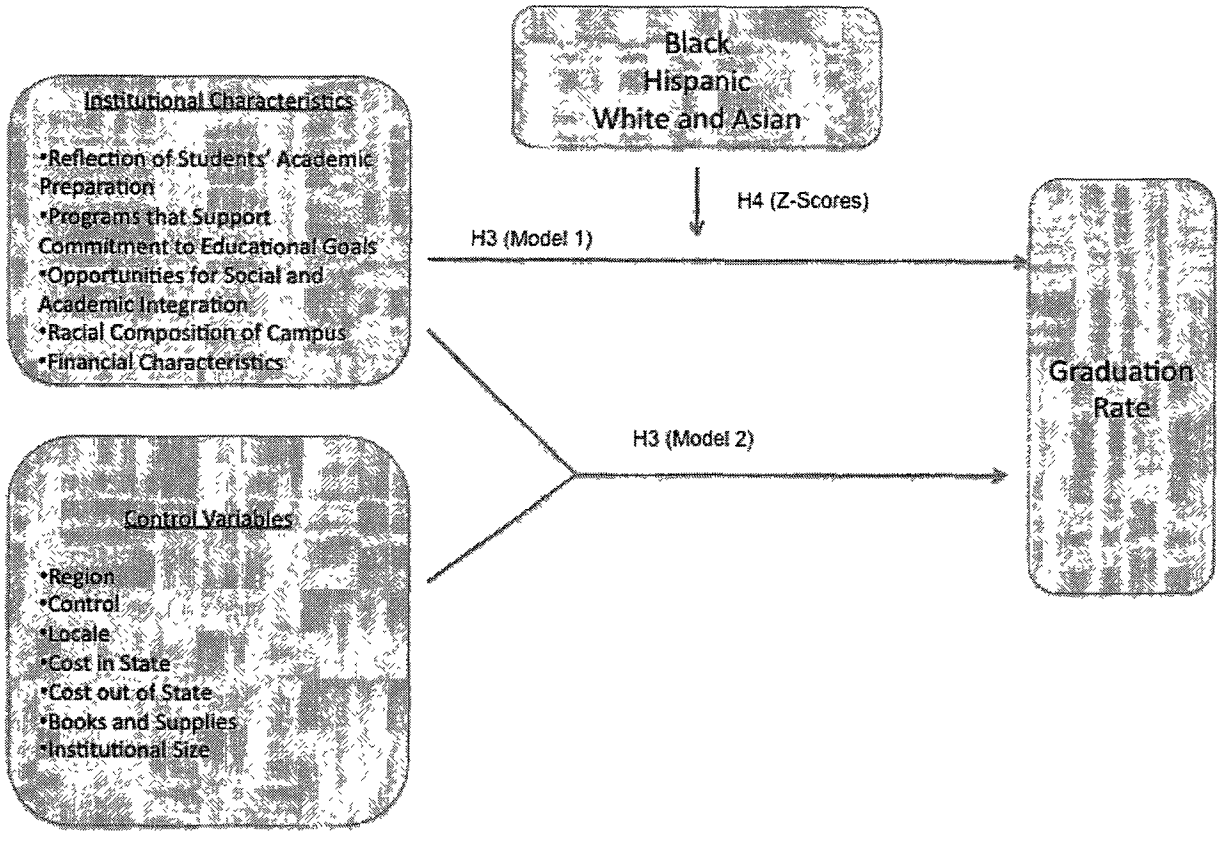
To test Hypothesis 4, the same analysis plan is repeated for the *Black Student Graduation Rate*, *Hispanic Student Graduation Rate*, and *White and Asian Student Graduation Rate*. I then compare the Model 2 coefficients from each of the institutional characteristics. I compute a z-score to test for a statistical difference between the coefficients (Equation 4.2).

Equation 4.2: Z-Score Computation

$$z = \frac{(b_1 - b_2)}{\sqrt{(SEb_1^2 + SEb_2^2)}}$$

Using a probability chart, I determine the statistical significance of the difference between each set of coefficients. Figure 4.1 illustrates the conceptual model for Hypothesis 3 and Hypothesis 4.

Figure 4.1: Conceptual Model for Hypothesis 3 and Hypothesis 4



Hypothesis 3 Test Results

I begin with the Reflection of Students' Academic Preparation variables, as measured by SAT verbal and math scores and whether the institution offers remedial classes. Model 1 includes the institutional characteristics and Model 2 adds the control variables (not shown). The regression results from the Reflection of Students' Academic Preparation concept is displayed in Table 4.2.

Table 4.2 Regression Results for the Effects of Reflection of Students' Academic Preparation on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	1212	1212
F	471.34***	146.86***
R-Squared	.539	.648
Remedial	-4.846*** (.819)	-3.451*** (.741)
SAT Verbal 75	.086*** (.012)	.060*** (.012)
SAT Math 75	.083*** (.012)	.054*** (.012)
Constant	-40.885*** (3.588)	-22.906*** (3.592)

Standard errors in parentheses
Control variables are not shown in Model 2
*p<.05, **p<.01, ***p<.001

Reflection of Students' Academic Preparation Model 2 shows that remedial classes are negatively correlated with the total graduation rate. The negative relationship between remedial classes and the total graduation rate is somewhat surprising because remedial classes seem like they would be an asset or resource that a school uses to boost its graduation rates. However, this negative correlation may be due to other student-level variables not included in Model 2 or the relationship between remedial classes and the total graduation rate may differ based on the characteristics of the school. Both the mean 75th percentile verbal and math SAT score have a positive impact on the total graduation rate.

The next set of regression models investigates the effect of a school's Programs that Support Students' Commitment to Educational Goals on students' graduation rates (Table 4.3).

Table 4.3: Regression Results for the Effect of Programs that Support Students' Commitment to Educational Goals on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	2035	2035
F	123.99***	73.24***
R-Squared	.196	.409
Distance Learning	-9.935*** (.891)	-4.401*** (.855)
Study Abroad	11.370*** (.876)	1.637 (.961)
Weekend Classes	-6.834*** (.841)	-6.218*** (.749)
Per Capita Academic Support (log)	1.329*** (.221)	.052 (.200)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Support for Students' Commitment to Educational Goals. Model 2 in Table 4.3 reveals mixed results for the impact of institutional characteristics, primarily institutional resources, on the total graduation rate. Institutions with distance learning programs have lower total graduation rates than institutions without distance learning programs. Schools offering weekend classes have lower graduation rates than schools without weekend classes. The negative correlation between distance learning and the total graduation rate and weekend classes and the total graduation rate is likely a reflection of student level variables that suggest a substantial population of low-income, part-time, or non-traditional students at an institution; students who historically, have lower graduation rates. This likelihood is further explored later in the chapter.

Table 4.4 displays regression results from the relationship between an institution's Opportunities for Social and Academic Integration and student graduation rates.

Table 4.4: Regression Results for the Effects of Opportunities for Social And Academic Integration on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	1720	1720
F	41.40***	63.86***
R-Squared	.088	.417
ROTC	4.831*** (.955)	1.735* (.857)
Employment Services	.257 (1.855)	-3.482* (1.546)
Placement Services	1.306 (1.459)	-.161 (1.195)
Per Capita Student Services (log)	3.421*** (.298)	-.326 (.290)
Constant	23.692*** (2.497)	37.341*** (2.920)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Opportunities for Students' Social and Academic Integration. In Table 4.4, schools with a ROTC program have higher total graduation rates than schools without a ROTC program. In contrast, schools with employment services have lower graduation rates than schools without employment services. Employment services may be negatively correlated with the total graduation rate because schools with employment services may be more likely to have a higher percentage of students working while attending school. This institutional resource may be a reflection of the student-level characteristic, "hours spent working during the week."

Table 4.5 displays regression results for the effect of an institution's Racial Composition of Campus variables on graduation rates.

Table 4.5: Regression Results for the Effects of Racial Composition of Campus on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	2091	2091
F	62.59***	75.37***
R-Squared	.083	.396
Percentage Black Students	-.188 (.035)	.016 (.032)
Percentage Hispanic Students	-.079 (.051)	.063 (.043)
Percentage White and Asian Students	.098 (.032)	.174*** (.027)
Constant	46.282*** (2.815)	15.235*** (3.168)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Racial Composition of the Campus. In Model 2 (Table 4.5) only the percentage of white and Asian students is significantly correlated with the total graduation rate.

Table 4.6 displays the effect of Financial Characteristics variables on the graduation rates.

Table 4.6: Regression Results for the Effects of Financial Characteristics of Institution on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	1535	1535
F	211.74***	90.64***
R-Squared	.526	.580
Percent Financial Aid	-.029 (.038)	.027 (.039)
Percent Pell Grant	-.418*** (.025)	-.338*** (.027)
Average Pell Grant	-.001 (.001)	.000 (.001)
Percent Institutional Grant Aid	-.043* (.018)	-.075*** (.019)
Average Institutional Grant Aid	.001*** (.000)	.001*** (.000)
Percent Loan Aid	.071*** (.022)	.017 (.022)
Average Loan Aid	.000 (.000)	.000* (.000)
Per Capita Endowment (log)	1.491*** (.164)	1.417*** (.161)
Constant	46.285*** (3.727)	45.347*** (4.251)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Financial Characteristics of the Institution. In Model 2 (Table 4.6) an increase in the percentage of students who received a Pell grant is associated with a decrease in the total graduation rate. An increase in the percentage of students who receive institutional grant aid is associated with a decrease in the total graduation rate. An increase in the average institutional grant aid is associated with an increase in the total graduation rate. Average loan aid also has a statistically significant positive correlation with the total graduation rate. Finally, an increase in the per capita endowment is associated with an increase in the total graduation rate.

Effects of Financial Capital on the Total Graduation Rate.

In the previous models, some variables that are generally considered institutional resources have unexpected relationships with the Total Graduation Rate. For example, remedial classes, distance learning, weekend classes, and employment services are all negatively correlated with the total graduation rate. At the student level of analysis, socioeconomic status is often included in student retention models. The IPEDS data lacks a good measure of the socioeconomic level of the student body at each institution; the closest measure to this is the percentage of students who receive a Pell grant. Pell grants are indirect income measures (only students with family income under $50,000 are eligible to participate, but most awards are given to students with family incomes below $20,000); schools with a high percentage of students receiving Pell grants tend to also have low graduation rate. To explore the puzzle of the institutional resources' negative coefficients, I will include Pell grant percentage to try to

capture the socioeconomic level of the student body. I perform two additional analyses to determine if income/wealth of the student body at an institution accounts for some of the unexpected negative relationships found between institutional resources and the total graduation rate. First, the percentage of students receiving Pell grants included in the models with these institutional resources to rule out the negative relationship being spurious. Next, interaction terms are included to analyze whether or not the relationship between students' socioeconomic status and total graduation rate changes depending on the existence of a school's resources.

Table 4.7: Effect of Institutional Resources on Total Graduation Rate Controlling for Students' Financial Capital

Academic Preparation	
N	1212.000
F	122.55***
R-Squared	.661
Remedial	-3.411*** (.730)
SAT Verbal 75	.058*** (.012)
SAT Math 75	.048*** (.012)
Percent Pell Grant	-.119*** (.029)
_cons	-11.547** (4.532)
Commitment to Educational Goals	
N	2028.000
F	77.03***
R-Squared	.434
Distance Learning	-3.815*** (.837)
Study Abroad	.412 (.951)
Weekend Classes	-5.511*** (.738)

Per Capita Academic Support (log)	.052 (.197)
Percent Pell Grant	-.181*** (.022)
_cons	43.722*** (2.637)
Social and Academic Integration	
N	1713.000
F	75.92***
R-Squared	.473
ROTC	1.327 (.813)
Employment Services	-3.132* (1.469)
Placement Services	.542 (1.134)
Per Capita Student Services (log)	-.293 (.280)
Percent Pell Grant	-.301*** (.024)
_cons	53.683*** (3.135)

Standard errors in parentheses
Control variables not shown
*p<.05, **p<.01, ***p<.001

Table 4.7 displays results from each of the institutional level concepts that have institutional resources and Percent Pell Grant with the control variables. The financial capital variable, Percent Pell Grant, is statistically significant in every model; as the percentage of students receiving Pell Grants increases at an institution, the total graduation rate decreases. Percent Pell Grant also slightly decreases the negative coefficients of Remedial, Distance Learning, Weekend Classes, and Employment Services when it is included in the model; however, the inclusion of Percent Pell Grant does not change the direction of the relationship that these institutional resources have on the total graduation rate. Additionally, the r-squared does slightly increase but it does not significantly

change with the addition of Percent Pell Grant in Model 2. Student body characteristics are unavailable in the IPEDS data and therefore these findings cannot conclusively suggest that the negative relationships are non-spurious . However, the inclusion of Percent Pell Grant is one check for spuriousness.

Table 4.8: Effect of Institutional Resources on Total Graduation Rate with Students' Financial Capital Moderating				
Academic Preparation				
N	1212.000	1212.000	1212.000	
F	116.52***	123.48***	127.51***	
R2	.661	.674	.681	
Remedial	-4.904*** (1.476)	-2.683*** (.723)	-2.589*** (.714)	
satvr75	.057*** (.012)	.111*** (.014)	.049*** (.011)	
satmt75	.048*** (.012)	.046*** (.012)	.117*** (.014)	
Percent Pell Grant	-.169*** (.052)	.931*** (.153)	1.138*** (.147)	
Remedial *Pell Grant	.061 (.052)			
Satvr75* Pell Grant		-.002*** (.000)		
SAT MT 75* Pell Grant			-.002*** (.000)	
_cons	-9.766* (4.783)	-36.752*** (5.732)	--4040.855*** (.538)	
Commitment to Educational Goals				
N	2028.000	2028.000	2028.000	2028.000
F	73.42***	77.83***	73.93***	74.26***
R-Squared	.435	.449	.436	.437
Distance Learning	-2.410 (1.579)	-3.558*** (.827)	-3.698*** (.837)	-3.679*** (.836)
Study Abroad	.341 (.954)	13.081*** (1.970)	.454 (.950)	.456 (.949)
Weekend Classes	-5.509*** (.738)	-5.097*** (.731)	-9.035*** (1.501)	-5.446*** (.736)
Per Capita Academic Support (log)	.058 (.197)	.049 (.194)	.042 (.197)	1.049** (.357)

Percent Pell Grant	-.157*** (.032)	-.048 (.028)	-.229*** (.028)	-.026 (.051)
Distance Learning* Pell Grant	-.039 (.037)			
Study Abroad* Pell Grant		-.295*** (.040)		
Weekend Classes* Pell Grant			.096** (.035)	
Per Capita Academic Support (log)* Pell Grant				-.023*** (.007)
_cons	42.663*** (2.823)	39.014*** (2.681)	45.519*** (2.716)	37.531*** (3.218)
Social and Academic Integration				
N	1713.000	1713.000	1713.000	1713.000
F	74.22***	74.60***	74.94***	74.87***
R-Squared	.480	.481	.482	.482
ROTC	7.505*** (1.554)	1.287 (.807)	1.315 (.806)	1.453 (.807)
Employment Services	-2.606 (1.4650)	6.523** (2.394)	-1.532 (1.486)	-2.789 (1.459)
Placement Services	.682 (1.128)	.946 (1.129)	8.706*** (1.874)	.477 (1.125)
Per Capita Student Services (log)	-.216 (.279)	-.283 (.278)	-.307 (.278)	2.191*** (.539)
Percent Pell Grant	-.230*** (.028)	-.121** (.042)	-.135*** (.039)	.126 (.083)
ROTC* Pell Grant	-.190*** (.041)			
Employment Services* Pell Grant		-.244*** (.048)		
Placement Services* Pell Grant			-.240*** (.044)	
Per Capita Student Services (log)* Pell Grant				-.063*** (.012)
_cons	50.210*** (3.204)	46.232*** (3.440)	46.846*** (3.352)	37.294*** (4.356)

Standard errors in parentheses
Control variables not shown
*p<.05, **p<.01, ***p<.001

In Table 4.8, Percent Pell Grant is combined with the variables considered institutional resources: Remedial, Distance Learning, Weekend Classes, and Employment Services to make interaction terms. The statistically significant interaction terms provide more evidence for the previously stated suggestion that many of the surprising negative relationships between institutional resources and the total graduation rate are a result of student-level variables not included in the IPEDS data. Of all of the institutional resources, only the interaction between Weekend Classes and Percent Pell Grant has the expected relationship; weekend classes have a more positive effect when the student body has a lower socioeconomic status. This finding is consistent with the idea that weekend classes provide weekend classes provide a valuable option for non-traditional students who are disproportionate recipients of Pell grants (National Postsecondary Student Aid Study 2008). In contrast, the negative correlation of the other institutional resources and total graduation become more negative at schools where the student body has low socioeconomic status. These findings suggest that need for student body characteristics in the regression models.

Analysis for Hypothesis 4

To test Hypothesis 4, I first construct three separate regression models for the black, Hispanic, and white/Asian student graduation rates for each of the five institutional characteristics concepts. Overall, the similar patterns are found with

each race/ethnicity's graduation rate as are found with the total graduation rate. The following tables should be interpreted in the same manner as tables in the earlier part of this chapter; Model 1 displays the regression results with the variables from each concept and Model 2 includes control variables. For the full table of regression models see Appendix 4.

Table 4.9 Regression Results for the Effects of Reflection of Students' Academic Preparation on Graduation Rates

	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1133	1133	1041	1041	1212	1212
F	162.85***	46.76***	148.64***	37.54***	315.32***	89.22***
R-Squared	.302	.381	.301	.355	.439	.528
Remedial	-10.324*** (1.442)	-7.442*** (1.410)	-6.689*** (1.568)	-4.705** (1.558)	-3.345** (1.159)	-1.569 (1.101)
SAT Verbal 75	.112*** (.023)	.078*** (.023)	.115*** (.025)	.089*** (.026)	.075*** (.018)	.064*** (.017)
SAT Math 75	.037 (.022)	-.007 (.023)	.062* (.025)	.022 (.026)	.129*** (.017)	.065*** (.018)
Constant	-35.130*** (6.265)	-24.945*** (6.825)	-52.544*** (7.108)	-39.076*** (7.716)	-64.831*** (5.076)	-47.110*** (5.335)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Reflection of Students' Academic Preparation

Black Student Graduation Rate. Model 2 (Table 4.9) shows that schools offering remedial classes have lower black student graduation rates than schools that do not offer remedial classes. An increase in the 75th percentile verbal SAT score is associated with an increase in the black student graduation rate.

Hispanic Student Graduation Rate. Schools with remedial classes have lower Hispanic student graduation rates than schools without remedial classes. An increase in the mean 75th percentile SAT score is associated with an increase in the Hispanic student graduation rate.

White and Asian Student Graduation Rate. Both the mean 75th percentile SAT verbal and math SAT scores are positively correlated with the white and Asian student graduation rate.

When considering all models from both Hypothesis 3 and 4, the SAT verbal score has the most consistent impact on college graduation rates. It is statistically significant in all eight regression models. Remedial classes negatively predict graduation rates in seven of the regression models and the math SAT score positively predicts graduation rates in five of the models. These findings suggest that students' academic preparation for college does have an impact on an institution's graduation rate.

Table 4.10: Regression Results for the Effect of Programs that Support Students' Commitment to Educational Goals on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1751	1751	1574	1574	2035	2035
F	69.36***	44.46***	73.84***	36.85***	114.45***	79.16***
R-Squared	.137	.328	.158	.311	.184	.427
Distance Learning	-9.793*** (1.286)	-2.820* (1.278)	-11.745*** (1.423)	-4.829*** (1.466)	-5.217*** (1.076)	-.056 (1.008)
Study Abroad	13.256*** (1.295)	-.287 (1.430)	13.034*** (1.458)	-.355 (1.642)	16.637*** (1.057)	.997 (1.132)
Weekend Classes	-4.348*** (1.162)	-2.809** (1.078)	-6.619*** (1.278)	-4.610*** (1.214)	-6.043*** (1.015)	-4.764*** (.883)
Per Capita Academic Support (log)	2.643*** (.407)	.333 (.379)	3.267*** (.474)	.963* (.455)	2.415*** (.267)	.693** (.235)
Constant	19.565*** (3.445)	11.466** (4.213)	20.899*** (4.031)	6.306 (4.927)	23.347*** (2.173)	4.486 (2.806)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Support for Students' Commitment to Educational Goals

Black Student Graduation Rate. Only the effects of distance learning and weekend classes are statistically significant predictors of the black student graduation rate. Both of the institutional resources are associated with a decrease in the black student graduation rate.

Hispanic Student Graduation Rate. Similar patterns occur for the Hispanic student graduation rate (Table 4.10). Schools with either distance learning programs or weekend classes have lower Hispanic student graduation rates than

schools without these resources. However, increases in Per Capita Academic Support are associated with increases in the total graduation rate.

White and Asian Student Graduation Rate. Table 4.10 shows that schools with weekend classes have lower white and Asian student graduation rates than schools without weekend classes. Increases in Per Capita Student Support are associated with an increase in the white and Asian student graduation rate.

Most of the Programs that Support Commitment to Educational Goals variables are statistically significant predictors of graduation rate, even when control variables are added. *Distance Learning* is a negative predictor of the total, black, and Hispanic graduation rates. *Weekend Classes* is a negative predictor of graduation rates in all regression models. *Per Capita Academic Support* is a positive predictor of both the Hispanic and the white and Asian graduation student graduation rate.

Table 4.11: Regression Results for the Effects of Opportunities for Social And Academic Integration on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1485	1485	1344	1344	1720	1720
F	42.80***	41.15***	36.83***	33.03***	65.91***	77.04***
R-Squared	.104	.348	.099	.322	.133	.463
ROTC	8.228*** (1.286)	2.965* (1.212)	6.889*** (1.411)	.740 (1.353)	8.059*** (1.135)	1.262 (1.003)
Employment Services	-3.494 (3.025)	-6.486* (2.626)	7.581* (3.532)	4.357 (3.115)	9.375*** (2.205)	1.505 (1.809)
Placement Services	6.110** (2.143)	4.233* (1.863)	1.311 (2.348)	-2.446 (2.082)	3.925* (1.735)	-.135 (1.398)
Per Capita Student Services (log)	5.183*** (.467)	.178 (.541)	5.865*** (.540)	.813 (.676)	3.883*** (.355)	.342 (.339)
Constant	-2.664 (4.242)	10.090 (5.353)	-9.616* (4.960)	-5.889 (6.434)	3.671 (2.968)	4.760 (3.417)

Standard errors in parentheses
Control over
*p<.05, **p<.01, ***p<.001

Opportunities for Students' Social and Academic Integration

Black Student Graduation Rate. Model 2 (Table 4.11) shows that schools with a ROTC have higher black student graduation rates than schools without a ROTC program. Institutions with employment services have lower black student graduation rates than schools without employment services. Alternately, schools with placement services have higher black student graduation rates than schools without placement services.

Hispanic Student Graduation Rate. In Model 1 (Table 4.11), the existence of a ROTC program, employment services and per capita student services funding are statistically significant predictors of the Hispanic student graduation rate. However, in Model 2, none of the Opportunities for Social and Academic

Integration variables retained their explanatory power. The control variables add to the explanatory ability of the model, but eliminate the effects of the Social and Academic Integration institutional characteristics.

White and Asian Student Graduation Rate. Finally, in Model 1 all of the Opportunities for Social and Academic Integration variables have a statistically significant, positive relationship with the white and Asian student graduation rate. When the control variables are added in Model 2 (Table 4.11), none of the integration variables maintain their statistical significance.

The findings from the previous regressions show that Opportunities for Social and Academic Integration have a significant impact on an institution's graduation rate. *ROTC* programs have a positive impact on both the total student graduation rate and on the black student graduation rate. *Employment Services* are negatively correlated with the total graduation rate and on the black student graduation rate. *Placement Services* have a positive impact on the black student graduation rate. None of the variables are statistically significant predictors of either the Hispanic or the white and Asian graduation rate in Model 2.

Table 4.12: Regression Results for the Effects of Racial Composition of Campus on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1802	1802	1619	1619	2091	2091
F	6.53**	48.62***	24.40***	39.79***	73.53***	90.29***
R-Squared	.011	.329	.043	.309	.096	.440
Percentage Black Students	-.109* (.054)	.267*** (.050)	-.373*** (.064)	-.033 (.061)	-.345*** (.042)	-.101** (.037)
Percentage Hispanic Students	-.139 (.075)	.197** (.065)	.012 (.076)	.309*** (.069)	.015 (.060)	.164*** (.050)
Percentage White and Asian Students	.000 (.051)	.197*** (.046)	-.011 (.054)	.093 (.050)	.036 (.038)	.115*** (.032)
Constant	41.814*** (4.519)	-10.522* (5.101)	47.740*** (4.743)	-2.585 (5.472)	47.623*** (3.348)	-1.187 (3.655)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Racial Composition of the Campus

Black Student Graduation Rate. In Model 2, all of the Racial Composition of Campus variables are positively correlated with the black student graduation rate. The effect of the percentage of black students on the black student graduation rate has a steeper slope than either the percentage of Hispanic students or the percentage of white and Asian students.

Hispanic Student Graduation Rate. In Model 2, the only statistically significant variable is the percentage of Hispanic students at an institution. An increase in the percentage of Hispanic students enrolled at a school is associated with an in the Hispanic student graduation rate

White and Asian Student Graduation Rate. All of the Racial Composition of Campus variables in Model 2 are statistically significant. For each additional

percentage of black students enrolled at an institution, the white and Asian student graduation rate decreases. For each additional percentage of Hispanic students enrolled at an institution, the white and Asian student graduation rate increases. For each additional percentage of white and Asian students at an institution, the white and Asian student graduation rate increases.

All of the Racial Composition of Campus variables are statistically significant in at least one of the regression models. *Percent Black Students* has a positive impact on the black student graduation rate, but a negative impact on the white and Asian student graduation rate. *Percent Hispanic Students* is a positive predictor of the black, Hispanic, and white and Asian student graduation rate. *Percent White and Asian* has a positive impact on the total, black, and white and Asian student graduation rates.

Table 4.13: Regression Results for the Effects of Financial Characteristics of Institution on Graduation Rates

	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1400	1400	1281	1281	1535	1535
F	85.42***	37.58***	75.86***	31.41***	152.13***	66.98***
R-Squared	.329	.386	.323	.365	.444	.505
Percent Financial Aid	.018 (.065)	.026 (.066)	-.042 (.069)	-.008 (.072)	.008 (.052)	.042 (.053)
Percent Pell Grant	-.335*** (.043)	-.220*** (.048)	-.438*** (.051)	-.272*** (.056)	-.561*** (.034)	-.384*** (.037)
Average Pell Grant	.003* (.001)	.002* (.001)	-.001 (.002)	-.002 (.002)	.000 (.001)	-.001 (.001)
Percent Institutional Grant Aid	-.102*** (.030)	-.078* (.033)	-.020 (.033)	.003 (.039)	-.034 (.024)	.010 (.027)
Average Institutional Grant Aid	.002*** (.000)	.001*** (.000)	.001*** (.000)	.000 (.000)	.001*** (.000)	.001*** (.000)
Percent Loan Aid	.027 (.037)	-.004 (.040)	-.133*** (.040)	-.167*** (.043)	-.003 (.030)	-.023 (.031)

Average Loan Aid	.000 (.000)	-.001** (.000)	.000 (.000)	-.001 (.000)	.000 (.000)	-.001* (.000)
Per Capita Endowment (log)	1.358*** (.273)	1.137*** (.273)	1.173*** (.292)	1.125*** (.294)	.911*** (.224)	1.068*** (.220)
Constant	22.193*** (6.397)	23.285** (7.543)	53.097*** (7.229)	37.852*** (8.468)	48.380*** (5.078)	29.281*** (5.803)

Standard errors in parentheses
Control variables not shown in Model 2
*p<.05, **p<.01, ***p<.001

Financial Characteristics of the Institution

Black Student Graduation Rate. In Model 2 (Table 4.13), for every additional percentage point of students receiving a Pell grant, the black student graduation rate decreases. For each one-percentage point increase in the percentage of students receiving institutional grant aid, the black student graduation rate decreases. Increases in the average institutional grant aid are associated with an increase in the black student graduation rate and increases in the average loan aid are associated with a decrease in the black student graduation rate. For every one-percentage point increase in an institution's endowment, the black student graduation rate increases.

Hispanic Student Graduation Rate. In Model 1 (Table 4.13), the *Percent Pell Grant*, *Average Institutional Grant Aid*, and *Percent Loan Aid* are negatively related to the Hispanic student graduation rate and the average institutional grant aid and the per capita endowment are positively related to the Hispanic student graduation rate.

In Model 2 (Table 4.13), each additional percentage point of students receiving a Pell grant is associated with a decrease in the Hispanic student

graduation rate. An increase in the percentage of students receiving loan aid is correlated with a decrease the Hispanic student graduation rate. For each one-percentage point increase in an institution's per capita endowment, the Hispanic student graduation rate increases.

White and Asian Graduation Student Graduation Rate. The percentage of students receiving Pell grants, average institutional grant aid, and the per capita endowment are all statistically significant predictors of the white and Asian student college graduation rate in Model 2 (Table 4.13). The average loan aid is a statistically significant predictor of the white and Asian graduation rate. Model 2 shows that for an increase in students receiving a Pell grants is correlated with a decrease in the white and Asian student graduation rates. *Average Institutional Grant Aid* is associated with an increase in the white and Asian student graduation rate; however, the average loan aid is associated with a decrease in the white and Asian student graduation rate. Finally, an increase in the institution's per capita endowment is correlated with an increase in the white and Asian student graduation rate.

The regression models show that Financial Characteristics are statistically significant predictors of college graduation. *Percent Pell Grant* is negatively correlated with the total, black, Hispanic, and white and Asian graduation rates. *Percent institutional Grant Aid* has a positive impact on the total and white and Asian student graduation rates, but a negative impact on the black student graduation rate. *Average Loan Aid* is positively correlated with the total graduation rate and negatively correlated with the black and white and Asian

student graduation rates. *Percent Loan* negatively correlated with the Hispanic student graduation rate. Finally, *Per Capita Endowment* is positively correlated with the black, Hispanic, and white and Asian student graduation rates.

Next, I test for statistical differences in the coefficients by calculating z-scores using the Model 2s from each set of Institutional Characteristics variables. The calculated z-scores are displayed in Table 4.15.

Table 4.15: Z Scores						
	Black b	**Black-Hispanic Z-Score**	Hispanic b	**Hispanic-White/Asian Z-Score**	White/Asian b	Black-White/Asian z-score
Remedial	-7.442*** (1.410)	-1.303	-4.705** (1.558)	-1.644	-1.569 (1.101)	-1.418
SAT Verbal 75	0.078*** (0.023)	-0.317	0.089*** (0.026)	0.805	0.064*** (0.017)	-0.192
SAT Math 75	-0.007 (0.023)	-0.835	0.022 (0.026)	-1.360	0.065*** (0.018)	-0.508
Distance Learning	-2.820* (1.278)	1.033	-4.829*** (1.466)	-2.683**	-0.056 (1.008)	-3.287***
Study Abroad	-0.287 (1.430)	0.031	-0.355 (1.642)	-0.678	0.997 (1.132)	0.431
Weekend Classes	-2.809** (1.078)	1.109	-4.610*** (1.214)	0.103	-4.764*** (0.883)	-1.256
Per Capita Academic Support (log)	0.333 (0.379)	-1.064	0.963* (0.455)	0.527	0.693** (0.235)	-2.077**
ROTC	2.965* (1.212)	1.225	0.740 (1.353)	-0.310	1.262 (1.003)	0.359
Employment Services	-6.486* (2.626)	-2.661**	4.357 (3.115)	0.792	1.505 (1.809)	-2.096**
Placement Services	4.233* (1.863)	2.391**	-2.446 (2.082)	-0.922	-0.135 (1.398)	-0.014
Per Capita Student Services (log)	0.178 (0.541)	-0.733	0.813 (0.676)	0.623	0.342 (0.339)	-1.497
Percent Black Students	0.267*** (0.050)**	3.804***	-0.033 (0.061)	0.953	-0.101** (0.037)	2.392**
Percent Hispanic Students	0.197*** (0.065)	-1.182	0.309*** (0.069)	1.702	0.164*** (0.050)	-1.532
Percent White/Asian Students	0.197*** (0.046)	1.531	0.093 (0.050)	-0.371	0.115*** (0.032)	1.409
Percent Financial Aid	0.026 (0.066)	0.348	-0.008 (0.072)	-0.559	0.042 (0.053)	-0.228
Percent Pell Grant	-0.220*** (0.048)	0.705	-0.272*** (0.056)	1.669	-0.384*** (0.037)	1.004
Average Pell Grant	0.002 (0.001)	1.789	-0.002 (0.002)	-0.447	-0.001 (0.001)	0.707
Percent Institutional Grant Aid	-0.078* (0.033)	-1.585	0.003 (0.039)	-0.148	0.010 (0.027)	-2.575**

Average Institutional Grant Aid	0.001*** (0.000)	-----	0.000 (0.000)	------	0.001*** (0.000)	------
Percent Loan Aid	-0.004 (0.040)	2.775**	-0.167*** (0.043)	-2.716**	-0.023 (0.031)	1.052
Average Loan Aid	-0.001** (0.000)	-------	-0.001 (0.000)	--------	-0.001* (0.000)	---------
Log Per Capita Endowment	1.137*** (0.273)	0.030	1.125*** (0.294)	0.155	1.068*** (0.220)	1.280

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Race/ethnicity moderates the effect of some Institutional Characteristics variables on graduation rates. Distance learning programs have a stronger negative association with the Hispanic student graduation rate than with the white and Asian student graduation rate. Similarly, *Distance Learning* has a more negative impact on the black student graduation rate than on the white or Asian student graduation rate. This finding may be because schools with distance learning programs are more likely to have non-traditional students, a group with lower graduation rates. Furthermore, Hispanic and black student have historically lower graduation rates than white or Asian students. The findings reflect the coupling of two factors: schools with non-traditional class structures attracting students less likely to graduate and low graduation rates of underrepresented students. *Per Capita Academic Support* has a more positive impact on the white and Asian student graduation rate than on the black student graduation rate.

Employment Services has a statistically significant larger effect on the black student graduation rate than on the Hispanic student graduation rate or on the white and Asian student graduation rate. *Placement Services* has a statistically different effect on the black graduation rate compared to the Hispanic graduation rate. *Placement Services* has a statistically significant and positive impact on the black student graduation rate, but a non-statistically significant impact on the Hispanic student graduation rate.

Percent Black Students has a larger effect on the black student graduation rate than on the Hispanic student graduation rate and on the white and Asian student gradation rate. There is a statistical difference in the impact of

the *Percent Institutional Grant Aid* on the black student graduation rate compared to the Hispanic student graduation rate. *Percent Loan Aid* has a greater impact on the Hispanic student graduation rate when compared to either the black student gradation rate or the white and Asian student graduation rate.

Many of the institutional characteristics investigated in the models did have a statistically significant impact on the graduation rates. Some of the institutional characteristics (institutional resources such as Remedial, Distance Learning, or Weekend Classes, or Employment Services) are surprisingly associated with schools with lower graduation rates than schools without these characteristics. When most of these resources are combined with the effect of the percentage of low-income students, the negative effect becomes larger. Because of these findings, I reject the Hypothesis 3 null that institutional characteristics are not associated with an institution's graduation rate. Z-scores show that there are many differences in the impact of institutional characteristics on each racial/ethnic group's graduation rate. Therefore, I reject the Hypothesis 4 null that race/ethnicity does not moderate the relationship between institutional characteristics and graduation rates. Although my findings allow the rejection the null hypotheses that there is no relationship between institutional characteristics and graduation rates, it should be noted that the hypotheses cannot be fully tested without more student body characteristics. Future research on the role of the institution needs to include these student body characteristics. Chapter 5 discusses these findings in greater detail.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

In this chapter, I summarize findings from the previous two chapters and discuss the implications that these findings have for future research on education attainment. The discussion is organized around the four hypotheses posed at the beginning of this study. The final sections describe this study's limitations and implications for future research, practice and policy.

Discussion

The literature review first examines how capital and pre-college experiences set up the kinds of experiences that a student may have in college. For example, students who have at least one parent who graduated from college may rank graduation importance as extremely high because their parents showed them that education is a priority. These pre-college characteristics translate into a student's capital for college. Prior research found that students with high levels of social, financial, and cultural capital are more likely to graduate from college than students with lower levels of capital.

Once the framework is established, studies significant to exemplifying the role of capital in college graduation are reviewed. Two types of models, traditional models and non-traditional models, of student retention are identified. Traditional student retention models tend to be theoretical and not sensitive to minority populations. In contrast, non-traditional models are generally empirical and are better able to accommodate or articulate the needs of underrepresented student populations. This study uses capital as the dominant underlying theory to test four hypotheses concerning the relationship between student experiences and college graduation.

> H_1: There is an association between student experiences and degree completion status.
>
> H_2: The association between student experiences and degree completion status is moderated by race/ethnicity.
>
> H_3: Institutional characteristics are associated with an institution's graduation rate.
>
> H_4: The effects of institutional characteristics on college graduation rates are moderated by race/ethnicity.

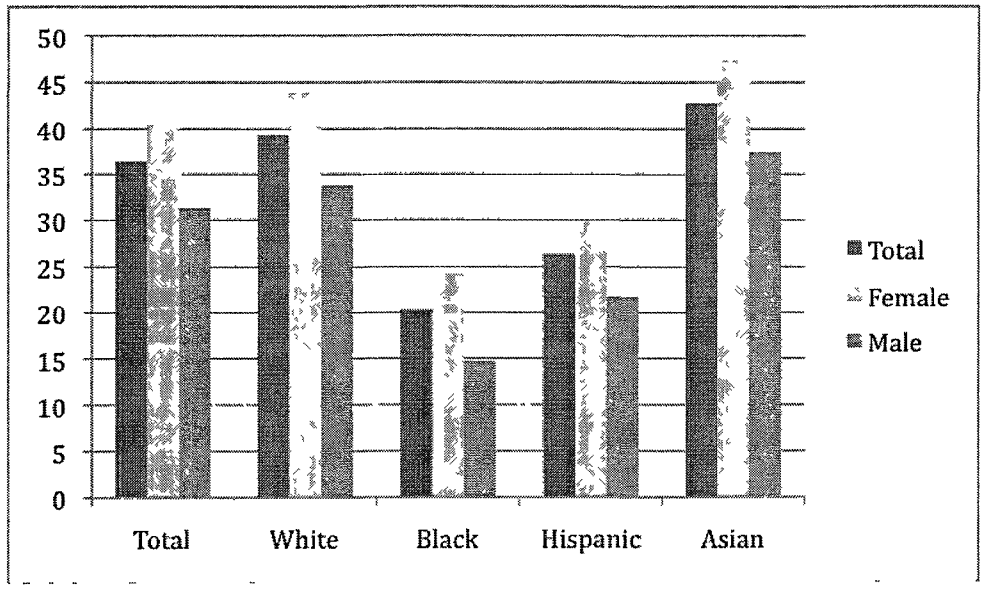
Discussion Hypothesis 1 and 2

In this study, black students have lower odds of graduating from college than non-black students, but Hispanic students' odds of graduating from college are the same as non-Hispanic students. The relationship between a student's black race and graduating from college is well documented in the literature. Studies have cited low-income, parental education, and other types of low capital as reason for black students' low educational attainment.

Wealth may be influential in this study because selective schools have much larger average endowments than non-selective schools and may be more likely to use this extra money to provide scholarships and financial aid opportunities for students. For example, 2008 IPEDS data shows that twenty-four (88%) of the twenty-eight selective schools in the NLSF have an endowment larger than the mean endowment of all four-year, degree granting institutions. In contrast, only 11.59% of all four-year, degree granting schools have within $1,000 of the mean endowment (IPEDS 2008). A 2010 Money CNN report cites fifty colleges and universities that have instituted policies to limit or eliminate student loans (CNN 2010). Of the fifty institutions with limited debt policies, seventeen are NLSF schools (Project on Student Debt 2010). Although these loan policies were not yet in effect in 1999 when the NLSF survey began, the schools likely had generous financial aid packages for years before instituting a limited debt policy.

There has been a noticeable gap between female and male college enrollments for the past decade. A 2010 American Council on Education report finds that women have represented about 57% of enrollments and earn about 57% of degrees at colleges and universities since at least 2000. However, when graduation rates are examined for minorities and non-minorities, the gap between men and women is substantially more pronounced (Figure 5.1).

Figure 5.1: College Graduation Rates by Race and Gender



NCES 2010

Figure 5.1 depicts graduation rates by both race/ethnicity and sex. For each race/ethnicity group, females graduate at substantially higher rates than males. For black and Hispanic students, the disparities between males and females is much larger than the disparities between male and female White and Asian students. Women also outnumber men in enrollments and graduation in the NLSF, but the graduation gap between minority men and women is much smaller at the selective institutions in the NLSF. The NLF oversampled minority students (but not specifically male minority students) and there may not be quite enough variability in graduation rates for the female variable to be statistically significant. This unique characteristic of the NLSF data may explain why gender does not have a statistically significant relationship with a student's likelihood of graduating from college.

Higher odds among first-generation students are also inconsistent with the literature. These findings may be reflective of the type of students represented in the NLSF. Charles *et al.* (2009) finds that immigrants and the children of immigrants are largely overrepresented among black freshmen at the schools in the NLSF. In 1999, only about 19% of the total population was a first- or second-generation black eighteen- or nineteen- years- old, compared to nearly 25% of black students in the NLSF who were first -or second- generation (Massey *et al.* 2007). Large percentages of Hispanic and Asian students were also of immigrant origin, but these percentages more closely reflected the percentages in the general population (Charles *et al.* 2009).

The "immigrant optimism" hypothesis may also be at play. Studies show that first- and second- generation immigrants have higher scholastic achievement than their peers whose families have been living in the United States for longer. Kao (1995) finds that black, Hispanic, and Asian students with immigrant parents have higher education aspirations and make better grades than their peers with native-born parents. Kao attributes these findings to immigrant parents passing on optimism about social mobility to their first-generation children. First-generation minority students outperform their peers, but later generations begin to assimilate to native-born minorities and have lower education achievement and attainment.

High School Preparation, High School GPA, and *AP Classes* are all positive predictors of college graduation status. The influence of all of these variables suggest that a student's high school academic experiences are very important to their success in college. Notably, *High School GPA* is a statistically significant predictor in all of the Model 1s and Model 2s. High school grade point average may be such a strong predictor of college graduation because it both reflects a student's academic preparation for college and it encourages a student to be confident about his or her skills for college. Zwick and Sklar (2005) find that students with high high school GPAs are more likely to have high college grades and are more likely to graduate from college.

The first hypothesis tests the relationship between in-college student experiences and student graduation status among undergraduate students at highly selective institutions. A series of multilevel models reveal that while some

Student Experiences variables do have a statistically significant effect on a student's college graduation status, most of the Student Experiences variables do not have a statistically significant effect on college graduation status (Models 2s).

Commitment to Educational Goals and Social and Academic Integration variables have the strongest influences on graduation status. Of the Commitment to Educational Goals variables, students who report high graduation importance are more likely to graduate from college than students who do not report high graduation importance. Graduation importance is closely related to a student's cultural capital for college. Parents transmit education values to their children by supervising homework, maintaining contact with their teachers, and discussing post-high school plans with their children (Lareau 2006; Davies and Kandel, 1981; Kerckhoff and Huff, 1974). These education values contribute to a student's cultural capital for college. High graduation importance may be the strongest Commitment to Educational Goals variable because it represents a desire rather than actual behavior. All students, regardless of their academic abilities or socioeconomic status can aspire to graduate from college. The high graduation rate of the students in the NLSF suggests that they have a strong desire to graduate from college and that graduation is important.

Of the Social and Academic Integration variables, the partying variable has a statistically significant negative effect on graduation. The number of hours spent partying during the week may be such a strong predictor of college graduation because it represents a type of social capital. Previous research has

identified social capital as a positive predictor of college graduation, but the findings in this study suggest that the kind of social capital is important. The specific kind of social capital that a student gains from partying, likely distracts from other activities that support a student's educational goals. Partying may give students more social networks, but often it is at the expense of grades, attending classes, or sleep. My findings suggest the detrimental effects of partying even at the most elite schools where students are most likely to graduate.
Students gaining social capital by participating in networks that directly support their education goals may be more beneficial than only engaging in social activities with friends.

None of the Racial Campus Climate variables are statistically significant, but a couple of unique characteristics of the data may explain the lack of a relationship. First, NLSF has a larger percentage of biracial black students than the number of blacks identifying themselves as multiracial in the general population (Spencer 1997). In the national population, only about 4% of blacks identified as multiracial compared to 17% of black students in the NLSF who had at least one nonblack parent. These students identifying as multiracial may be less affected by racial separation or stereotype threat because they feel like a member of multiple racial/ethnic groups (Charles *et al.* 2009, Steele 1999). Additionally, the vast majority of students from any race or ethnicity do not report being treated differently because of their race and as a result there were few cases to represent students who felt a high degree of racial separation. Both the differences between the U.S. black population and the black population of

students in the NLSF and the lack of variability in the racial campus climate variables may explain why the expected relationship between racial campus climate and graduation status is not found.

It was very surprising to find that none of the Perception of Financial Security concept variables are statistically significant. Financial difficulties are frequently cited in the literature as a contributing factor to a student's decision to stay in school (Swall *et al.* 2003). Not finding a relationship between the Perception of Financial Security Variables and College graduation may be related to the lack of statistical significance of the *Wealthy* variable. The schools in the NLSF are able to financially support their students and as a result, perhaps their students feel more financially secure. A closer look at the Perception of Financial Security variables illuminates this issue.

Students are asked how often they experienced financial aid problems (*Aid Problems)*, the importance of financial aid when applying to college (*Aid Importance)*, and the importance of cost when applying to college (*Cost Importance)*; zero represents low frequency or importance and ten represents high frequency or importance. The mean value of students who reported having financial aid problems was only 2.16, but the mean value of the importance of financial aid in applying to college and importance of cost in applying to college is 5.79 and 5.14, respectively. The variable distribution suggests that students are more concerned about paying for college during the application process than they are once they were actually in college, perhaps before more selective schools have more resources for student financial aid (Bowen *et. al* 2009).

Further evidence for NLSF students' relative reduced financial concern is in their working habits. The students in the NLSF work less than the average full-time student. A 2009 National Center for Education Statistic Table reveals that in 2000, about 20% of college students worked under twenty hours per week, 21% of college students worked between twenty and thirty-four hours per week, and 8% of college students worked more than thirty-five hours per week (NCES 2009). However, about 98% of students in the NLSF work under twenty hours per week. Students at elite colleges and universities may not have to work as much as other students because their schools are better able to support them financially. This, in turn, allows them to focus more on school and increases their likelihood of graduating from college. The Perceptions of Financial Security variables are not statistically significant in this study, but these findings are likely unique to this particular sample.

The limited relationship between student experiences and college graduation (only two of the thirty-eight variables were statistically significant) is surprising, but reasonable after considering the make-up of the students in the NLSF study. An untested but plausible explanation for the findings could be the intrinsic motivation the NLSF students possess to apply, to enroll, and to be successful at these highly selective institutions regardless of how they spent their time in college. For these students, factors not measured in this study like motivation or self-efficacy may drive their graduation status more than their in-college experiences.

Alternately, these findings could be a reflection of student experiences and behaviors not measured in this study. While the NLSF asked a variety of questions about how students spend their time in college, the survey is intended to shed light on their pre-college origins. Undoubtedly, the survey cannot capture every student's in-college experience or every experience that a student could have in college.

It could also be the case that pre-college characteristics are simply more influential than in-college experiences. Most of the pre-college characteristics used in this study represent some aspect of the student's capital for college and the literature suggest a strong link between pre-college characteristics and college graduation.

Because I did find some support for Hypothesis 1, I reject its null hypothesis that there is no association between student experiences and college graduation status. However, it is important to note that the found association is extremely limited.

The second hypothesis examines whether the impact of the two statistically significant Student Experiences variables on college graduation differ by racial/ethnic background after controlling for pre-college characteristics. The results reveal that there is no statistically significant interaction effect between either race/ethnicity and *High Graduation Importance* or race/ethnicity and *Partying*. There is a statistically significant main effect for the *Black* variable on college graduation status, but there is not a statistically significant main effect for the *Hispanic* variable on college graduation status. This suggests that

race/ethnicity and student experiences do not affect college graduation status simultaneously, however both race/ethnicity and student experiences do influence college graduation status independently. For instance, non-black students have higher probabilities of graduating from college than black students in this sample, when controlling for pre-college characteristics and student experiences. Comparisons on the mean college graduation status among racial/ethnic groups support this finding. For example, only about 79% of black students in the NLSF graduated from college compared to 91% of white students. Because there is no interaction between race/ethnicity and Student Experiences variables, I fail to reject the Hypothesis 2 null that the association between student experiences and college graduation status is moderated by race.

Findings for Hypothesis 2 may be unique to the sample of students in the NLSF. Massey *et al.* (2006) do find some differences in family background, childhood neighborhoods, and high school qualities among black, Hispanic, and white and Asian students, but perhaps the differences are not big enough to yield disparities in graduation statuses among the groups. Considering that many of the student experiences variables are not statistically significant predictors of graduation status, the race and ethnicity variable may not have been statistically significant moderators because an incomplete list of Student Experiences variables.

Although the unique characteristics of the NLSF students should be kept in mind, the statistically significant findings from Part 1 of this study can generally

be extended to other institutions. For example, if graduation importance is a significant predictor of college graduation at schools with higher graduation rates and less variability in student's academic preparation for college then it is likely also a significant predictor at institutions with more standard profiles. Similarly, if partying during the week negatively impacts students who are very likely to graduate, than its effect is likely even more detrimental for students who have average probabilities of graduating.

Part 1 of this study had several key findings. Pre-college characteristics are the most consistently impactful predictors of college graduation. In every model, black, first-generation, and high school GPA are significantly statistically related to a student's college graduation status. While the relationship between student capital for college (pre-college characteristics and college gradation is well-documented in the literature, the findings in this study have some unique features.

In nearly all of the models, black students have lower odds of graduating from college than their non-black peers. If black students have lowest odds of graduating from colleges at schools where students are most likely to graduate, then their odds are expected to be even lower at schools with more standard profiles. Wilson's (1978) book, The *Declining Significance of Race: Blacks and Changing American Institutions,* is often debated in sociology literature. In the book, Wilson argues that the impact of race on a person's life chances is losing its stronghold to class and eventually class, not race, will be the most influential stratifying agent in American society. This study finds that the impact of race in

the higher education arena is not declining, but rather, race is both continuing and persistent. Regardless of the student experiences variables in the models analyzed Part 1 of the study, the black variable is both negative and statistically significant. The findings in this study highlight the need for more research and better strategies for student retention.

Not finding a statistically significant relationship between Hispanic and college graduation in any of the models was particularly surprising because the negative impact of being Hispanic is well-cited in the literature and the black variable had such a strong impact on college graduation in the models. In the NLSF, Hispanic students are not a homogeneous group and have varied demographic and high school experiences. The significant variation in the Hispanic group likely explains why there was not a significant relationship between Hispanic ethnicity and college graduation status.

Finally, the limited relationship between student experiences and college graduation (only two of the thirty-eight variables were statistically significant) is surprising. It could be the case that pre-college characteristics are simply more influential than in-college experiences. Most of the pre-college characteristics used in this study represent some aspect of the student's capital for college and the literature suggest a strong link between pre-college characteristics and college graduation.

Alternately, these findings could be a reflection of student experiences and behaviors not measured in this study. While the NLSF asked a variety of

questions about how students spend their time in college, the survey is intended to shed light on their pre-college origins. Undoubtedly, the survey cannot capture every student's in-college experience or every experience that a student could have in college.

Considering the type of student attending an NLSF school, a plausible explanation for the findings could be the intrinsic motivation the NLSF students possess to apply, to enroll, and to be successful at these highly selective institutions regardless of how they spent their time in college. For these students, factors not measured in this study like motivation or self-efficacy may drive their graduation status more than their in-college experiences.

Discussion Hypothesis 3 and 4

The third hypothesis tests the impact of institutional characteristics on the institutional graduation rates. Using variables from the five main concepts identified in the literature, I found at least one institutional characteristic from each concept that significantly predicts the total graduation rates. This basic finding is important because it highlights the need for future research to consider the role of the institution in college student success. However, the nature of the relationships between institutional characteristics and graduation rates are also worthy of discussion. The institutional characteristics in Part 2 of this study were generally considered institutional resources and were expected to positively predict graduation rates and it was surprising to find that instead, many of the institutional characteristics are negatively associated with graduation rates. However, in one case, the institutional resource weekend classes did have a

positive effect on schools with a high percentage of low-income students. The presence of other institutional resources (remedial, distance learning, and employment services) resulted in lower graduation rates at schools with high low-income student populations than at schools without these resources. All schools with these resources have lower graduation rates than schools without the resources. This finding suggests the need to look more closely at what each relationship signifies about the nuanced role of the institution in college graduation rates. In order for future studies to fully examine this role, the analysis must also include the student body characteristics that are largely unaddressed in this study.

Of the Commitment to Educational goals variables, remedial classes have a negative effect on the total graduation rate and both of the SAT variables have a positive effect on the total graduation rate. Remedial classes are a reflection of students' academic preparation for college- institutions that offer remedial classes may have lower graduation rates than institutions that do not offer remedial classes because they have a higher percentage of academically underprepared students. In contrast, the SAT variables represent students' high academic preparation for college and colleges that have students with particularly high SAT scores naturally, have higher graduation rates.

Of the Support for Students' Commitment to Educational Goals variables, distance learning and weekend classes both negatively predicted the total graduation rate. Both distance learning programs and weekend classes are associated with non-traditional students and institutions that offer these programs

may have higher percentages of these students. Non-traditional students include: students who did not attend college within a year after college, have full-time employment, have dependents, etc (NCES 2010). Historically, non-traditional students have lower graduation rates than their traditional peers.

ROTC and employment services are the significant predictors from the Opportunities for Social and Academic Integration model. ROTC programs may be associated with an increase in the graduation rate because the military program fosters a stronger sense of community at the college. Although not all students are members of ROTC, the program's existence on campus reaffirms all students' social integration to the institution. Employment services are found to have a negative impact on the total graduation rate. Colleges with higher percentages of students who need to work to pay for their college education may be more likely to have employment services. There is evidence that the number of hours that a student works during the week can be detrimental to their college performance (Massey et. al 2006). An office that offers employment services is likely closely related to students who need employment and the negative relationship between employment services and the total graduation rate is actually just a reflection of the low financial capital of students at the institution.

The percentage of white and Asian students at a school was the only Racial Composition of Campus variable that was statistically significant. The mean percentage of white and Asian students was about 68%. As determined in the student-level data, white and Asian students are most likely to come to college with the kinds of capital needed to succeed in college. Thus, increases in

the percentage of white and Asian students at an institution are naturally associated with increases in the total graduation rate.

The percentage of students receiving Pell grants and the percentage receiving institutional grant aid have negative impact on the total graduation rate. In contrast, the average institutional grant aid, average loan aid, and per capita endowment have a positive impact on the total graduation rate. These mixed findings may be related to the negative relationship between low-income students and college graduation. For example, only students with expected family contributions below $5,273 are eligible for Pell grants (Student Aid 2010). Schools with a considerable number of students receiving Pell grants are also schools with a considerable number of low-income students who are less likely to graduate from college than their middle-class peers. . One explanation for these findings may be that grants, fellowships, and loans can help mitigate the rising costs of college education, but they can rarely ameliorate all of the financial burdens of paying for college. Students are left struggling to pay for residual costs not covered by financial aid and some of the negative relationships between a school's financial characteristics and graduation rate may be a reflection of this struggle. On the other hand, there does appear to be difference in the kinds of characteristics that are associated with a negative impact on graduation rates- the percentage of students in a group decreases the graduation rate, but the money awarded to students increases the graduation rate. These findings may be related to the discussion for Part 1 of the study; institutions that

offer more financial aid and support to their students have higher graduation rates.

Although, I do find statistically significant relationships in the models that test Hypothesis 3, they could have been improved. The highest R^2 in any model was .704 and, despite being relatively high for social science research, indicates a lot of unexplained variance in college graduation rates that could probably be explained by adding student characteristics to the model. However, some latent institutional characteristics not captured by the IPEDS survey such as the quality or use of institutional resources may also be important variables to include in the model. The findings in Part 2 of this study allow me to reject of the Hypothesis 3 null that there is no relationship between institutional characteristics and graduation rates.

There are some differences in the ways Institutional Characteristics variables affect the graduation rates of different races/ethnicities. Calculated z-scores determine statistical differences in coefficients and provide support for Hypothesis 4.

Employment services and percentage of students receiving institutional grant aid both have the most negative effect on the black student graduation rate. Although both of these findings were anticipated to have a positive impact on graduation rates, there are a few explanations for these findings. The negative relationship between employment services and the black graduation rate may be related to the number of hours that Black students report working during the week. Massey et. al (2006) cite a negative relationship between working during

the week and college graduation. The percentage of students receiving institutional grant may negatively impact the black student graduation rate more than any other race/ethnic group because black students are most likely to be from families with low-income and low-income students are more likely to have reduced graduation rates.

Placement services have the most positive effect on the black student graduation rate. Black students disproportionately complete their degrees in the humanities and social sciences- fields that may not have internships, co-op, or practicum opportunities. Placement services are especially important to help students find jobs who do not otherwise have opportunities to look for post-graduation employment. The percentage of black students also has the most positive impact on the black student graduation rate. This finding is consistent with a 2009 Associate Press study finds that many Historically Black Colleges and Universities have comparable or higher college graduation rates than their Predominately White Institution peer schools when controlling for academic preparation and household income (Dispatch 2009).

Distance learning is negatively related to the graduation rate for all groups, but has the most negative impact on the Hispanic student graduation rate. Distance learning may have a negative effect because non-traditional students are the most likely to be enrolled in distance learning classes. Part-time, non-matriculated students are the most likely candidates for distance learning classes and also have lower college completion rates than their full-time, matriculated peers (Berge and Huang 2004). This negative effect of distance learning may not

be a direct effect of the distance learning classes, but is rather an effect of the group of characteristics associated with a student most likely to take a distance learning class. Distance learning is found to have the most negative impact on the Hispanic student graduation rate. Hispanic students in urban locales are the least likely have grown up with a computer in their home and have regular Internet access and therefore are least likely to benefit from online classes. (Korgen, Odell, Schumacher 2001). The percentage of students receiving loan aid has the most negative impact on the Hispanic student graduation rate. This is likely a reflection of the higher proportion of low-income Hispanic students in comparison to other races/ethnicities at colleges and university.

The per capita academic support funding is positively associated with all graduation rates, but the impact is greatest on the white and Asian graduation rate. This finding reiterates the need for tutoring, study skills programs, and general academic support at colleges and universities.

The fourth hypothesis investigated whether or not race/ethnicity moderates the impact of institutional characteristics on graduation rates. The tests for Hypothesis 4 suggest that there are statistically significant differences in the impact of institutional characteristics variables on each race/ethnic group's graduation rate (Table 5.1).

Table 5.1: Statistically Significant Variables by Race/Ethnicity Graduation Rate			
Concept	Black Graduation Rate	Hispanic Graduation Rate	White and Asian Graduation Rate
Reflection of Students' Academic Preparation	*Remedial (-)* *SAT Verbal 75(+)*	*Remedial (-)* *SAT Verbal 75(+)*	*SAT Verbal 75 (+)* *SAT Math 75 (+)*
Programs that Support Student's Commitment to Educational Goals	*Distance Learning (-)* *Weekend Classes (-)*	***Distance Learning (-)*** *Weekend Classes (-)* *Per Capita Academic Support Funding (log) (+)*	*Weekend Classes (-)* ***Per Capita Academic Support Funding (log) (+)***
Opportunities for Social and Academic Integration	*ROTC (+)* ***Employment Services (-)*** ***Placement Services (+)***	*Placement Services (-)*	
Racial Composition of Campus	***Percent Black Students (+)*** *Percent Hispanic Students (+)* *Percent White and Asian (+)*	*Percent Hispanic Students (+)*	*Percent Black Students (-)* *Percent Hispanic Students (+)* *Percent White and Asian Students (+)*

Financial Characteristics of the Institution	*Percent Pell Grant (-)* ***Percent Institutional Grant Aid (-)*** *Average Institutional Grant Aid (+)* *Average Loan Aid (-)* *Per Capita Endowment (log) (+)*	***Percent Loan Aid (-)***	*Percent Pell Grant (-)* *Average Institutional Grant Aid (+)* *Average Loan Aid (-)* *Per Capita Endowment (log) (+)*

Variables in bold represent largest impact

Employment Services (-), *Placement Services* (+), *Percent Black Students* (+), and *Percent Institutional Grant Aid* (-) all have the strongest impact on the black student graduation rate. *Distance Learning* (-) and *Percent Loan Aid* (-) have the strongest impact on the Hispanic student graduation rate. *Per Capita Academic Support Funding* (+) has the strongest impact on the white and Asian student graduation rate. Because of these findings, I reject the Hypothesis 4 null that the effect of institutional characteristics on graduation rates is not moderated by race.

Limitations

There are a few limitations associated with the present study. The first is related to the relatively high college graduation rate of the students in Part 1 of this study. Nearly 87% of students in the sample graduated from college (NLSF), compared to the national graduation rate of only about 51% (IPEDS 2008). The large disparity between the sample graduation rate and the national graduation rate suggests that the findings for Part 1 of the study may not be generalizable to all college students. The theories derived from these findings can, however, help guide future research.

The second limitation is related to usable sample size of the NLSF. A majority (99.7% of the 3,914) of the students from the initial NLSF were used in this study. However, the number of students who answered questions about

some of the student experiences is relatively small. The number of cases in the Commitment to Educational Goals model is 2232, the Social and Academic Integration model is 1944, the Perceptions of Racial Campus Climate model is 1932, and the Perceptions of Financial Security was 482. These smaller numbers are likely due to the deletion of cases because they are missing significant amounts of data including responses to the pre-college characteristics survey items. The deleted cases may have contained patterns of information that were not included in the analysis.

The third limitation is related to Part 2 of the study. Although the IPEDS contains detailed information about a wide array of institutional characteristics, the vast majority of the variables do not provide information about institutional resources or practices. For example, it is impossible to determine what activities student services funding supports or how many students study abroad. This study highlights the need for a comprehensive institutional level dataset that contains information about institution's practices, resources, and an evaluation of their use.

Finally, the study was unable to use individual student data for the full population of colleges and universities. Ultimately, the focus of the study is that graduation status of individual students, not only the graduation rates of universities. Rich data at the individual level for all of the schools in the IPEDS data would have better allowed me to answer my research questions.

Implications for Future Practice and Research

My findings have specific implications for the ways, students, administrators, and researchers can use this study in their future practice or research. For example, high school students who wish to attend highly selective colleges or universities may benefit from the results of this study. I find that pre-college characteristics have a significant influence on college graduation status especially high school preparation for college, high school GPA, and AP classes. Students who know about the relationship between these pre-college characteristics and college graduation status may decide to cultivate these characteristics as high school students.

Staff who work with TRIO outreach initiatives such as Upward Bound or Talent Search should take note of the results of this study. These initiatives were developed to help students matriculate through each stage of the education pipeline. Considering the relationship found between high school experiences and college graduation, these TRIO personnel could develop workshops that highlight the importance students doing well in high school to be successful in college.

High school teachers are among the other professionals who may benefit from the findings of this study. To help increase the number of students who attain college degrees, teachers may urge students to make good grades or take advanced placement classes. Additionally, high schools and colleges should

communicate openly to discuss how high schools can best prepare their students for college academics. (AACU 2002).

Colleges and universities may want to consider the findings from Hypotheses 3 and 4. For example, I find a positive relationship between the existence of employment services and the black student graduation rate. Colleges and universities with large populations of black students should take note of this finding and perhaps target some of their employment services programming to black students. Perhaps student services staff could co-sponsor events with a black student organization to bring interviewers or job fairs on campus.

These findings also have implications for future research. The present study is designed to determine whether student in-college experiences or institutional characteristics were related to college graduation. Although there is some support for these relationships, the analysis also found support for a relationship between pre-college characteristics and college graduation. A future study could further investigate how student experiences during high school relate to college graduation for minority students. This study should concentrate on students in their junior year or at the beginning of their senior year because the timing would capture students' experiences during a time when they are most likely to be preparing for college.

A qualitative methodology can also be used to explore the factors that influence college graduation. The present study was quantitative in nature and used existing data from an instrument that is not specifically designed to

measure influences on college graduation. A qualitative study can yield information about factors that influence college graduation and the potential graduates themselves. This method would give the researcher the ability to obtain rich stories and testimonials from students. For example, it would be interesting to hear the experiences of Hispanic students that might explain why some members of the group have educational attainment comparable to whites and others have extremely low graduation rates. Allowing everyone an opportunity to "tell their story" and then looking for similarities between the stories could help illuminate minority student college graduation.

The students in Part 1 of this study are all from highly selective, mostly private (abut 59%) institutions. A future study might lead researchers to investigate whether any relationship between student experiences and graduation exists at other types of schools. This study replicated, using a sample of schools with more varied characteristics, might reveal differences in the relationship between student experiences and college graduation based on race/ethnicity, gender, or socioeconomic status.

Conclusions and Sociological Contributions

This study analyzes data from both the NLSF and IPEDS to test four hypotheses and finds many statistically relationships between student experiences, institutional characteristics, and college graduation. Considering all

of the findings from hypotheses tests, the study makes four major contributions to the sociology of education literature.

1) Capital is a significant predictor of college graduation.

In Part 1, the most consistently significant predictors of college graduation are the proxies for a student's capital for college (pre-college characteristics). Regardless of the other variables included in the models, black, first-generation and high school GPA are related to college graduation status. Historically, black students have had lower capital for college than their white peers. Black families are more likely to have lower incomes (resulting in reduced financial capital), first-generation students in the NLSF are more likely to have parents that encourage high educational attainment (resulting in more cultural and social capital), and students with high high school GPAs are more likely to be academically well-prepared for college (a reflection of their social capital).

The relationship between capital and graduation rate continues in Part 2 of the study. Institutional characteristics associated with high capital are generally related to an increase in the graduation rate and Institutions associated with low capital are generally related to a decrease in the graduation rate. For example, the mean 75th percentile SAT scores are positively related to the graduation rate and reflect a student's academic preparation for college. In contrast, Pell grants are negatively related to the graduation rate and reflect a student's low financial capital.

2) Retention should be examined from both the student level of analysis and the institutional level.

Many student retention studies focus only on the relationship between students' pre-college characteristics and their eventually graduation. A few studies do also investigate the role of students' in-college experiences and behaviors in college graduation, but the number of studies that examine the role of the institution is extremely limited. This study finds that there are significant relationships between institutional characteristics and college graduation. It demonstrates the need for future research to take a multilevel approach to student retention.

3) Much more research is needed on Hispanic students' educational attainment.

This study did not find a significant relationship between Hispanic and college graduation status (Part 1) or that any institutional characteristics have a larger effect on the Hispanic student graduation rate compared to black or white/Asian student graduation rates. Despite the lack of significant relationships in this study, the Hispanic graduation rate is still far below the white and Asian graduation rates. Explanations for this disparity in graduation rate are much needed.

4) Educational attainment is growing for all groups, but much improvement is needed.

A larger and larger percentage of students are attending college after high school, but graduation rates continue to be astonishingly low. Considering this current condition of education in the United States, it is important to continue developing and implementing strategies for increasing student achievement. Underrepresented students, in particular, stand to benefit greatly from this targeted research that may eventually lead to educational equity among all groups.

APPENDICES

APPENDIX 1

List of National Longitudinal Survey of Freshmen Schools

List of National Longitudinal Survey of Freshmen Schools

1. Princeton University
2. Yale University
3. Stanford University
4. University of Pennsylvania
5. Columbia University
6. Northwestern University
7. Washington University in St. Louis
8. Emory University
9. Rice University
10. University of Notre Dame
11. University of California-Berkeley
12. Georgetown University
13. University of Michigan-Ann Arbor
14. Tufts University
15. University of North Carolina- Chapel Hill
16. Pennsylvania State University- University Park
17. Tulane University
18. Miami University-Oxford
19. Howard University
20. Oberlin College
21. Wesleyan College
22. Williams College
23. Barnard College
24. Bryn Mawr College
25. Denison College
26. Kenyon College
27. Smith College
28. Swarthmore College

APPENDIX 2

Correlations for H1 and H2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. overallg	1.000																					
2. black	-.096	1.000																				
3. hispanic	-.005	-.267	1.000																			
4. whiteasian	.083	-.593	-.618	1.000																		
5. wealthy	.062	-.095	-.104	.164	1.000																	
6. first generation	.073	-.059	-.151	.174	.277	1.000																
7. female	.008	.080	.014	-.077	-.094	-.050	1.000															
8. HS preparation	.045	.017	-.054	.032	.129	.114	.012	1.000														
9. hsGPA	.135	-.216	-.046	.215	.043	.024	.045	-.063	1.000													
10. ap1	.077	-.126	-.006	.108	.100	.080	-.042	.066	.153	1.000												
11. SAT	.070	-.361	-.106	.383	.202	.233	-.196	.135	.337	.225	1.000											
12. high graduation importance	.201	.030	.030	-.049	-.005	-.012	.067	.004	.083	-.007	-.013	1.000										
13. finish1year	-.016	.006	.027	-.027	-.008	-.035	.009	.028	-.030	-.001	-.024	.045	1.000									
14. finish2years	-.001	.039	-.020	-.016	.000	-.012	.017	.033	-.001	-.011	-.030	.047	.365	1.000								
15. graduate from college	.013	.058	-.030	-.023	.045	.023	.083	.068	.060	.041	-.015	.094	.160	.401	1.000							
16. postgradwork	-.047	.113	.000	-.092	.063	.061	.078	.064	.084	.028	-.026	.088	.024	.128	.250	1.000						
17. finish grad degree	-.045	.138	-.001	-.112	.053	.056	.089	.081	.061	.030	-.052	.107	.071	.177	.270	.883	1.000					
18. peerhelp	.003	.071	.000	-.058	-.005	-.001	.070	-.066	.001	-.004	-.108	.081	.053	.032	.056	.117	.104	1.000				

19. institutional help	-.067	.219	.031	-.205	-.088	-.088	.068	-.095	-.092	-.096	-.313	.057	.004	.014	-.007	.112	.114	.379	1.000			
20. professorial help	-.036	.160	.017	-.145	-.060	-.024	.042	.069	-.059	-.098	-.169	.028	.023	.057	.039	.183	.177	.229	.322	1.000		
21. librarylab	-.004	.130	.024	-.126	-.081	-.078	.106	-.037	-.002	-.017	-.126	.079	.030	.037	.020	.120	.123	.297	.289	.305	1.000	
22. mentor	.015	.097	.024	-.099	-.056	-.046	.159	.027	.025	-.007	-.102	.044	-.042	.020	.006	.060	.065	.074	.095	.171	.083	1.000
23. extracurriculars	.031	-.049	-.030	.065	.110	.113	-.113	.081	.031	.030	.061	.044	-.016	.037	.012	.122	.121	.064	.075	.136	.080	.041
24. inclass	.013	-.009	.007	.001	-.045	-.012	.028	-.051	.050	-.012	-.027	.027	-.015	.015	.037	.049	.048	.085	.086	.052	.119	.018
25. studying	.026	-.002	.018	-.013	-.019	-.013	.068	-.059	.158	.009	-.017	.052	-.012	-.010	.018	.063	.071	.079	.083	.148	.182	.072
26. activities	.018	.018	-.016	-.002	.009	-.033	-.084	-.018	.021	-.036	.017	.006	.029	.021	-.004	.005	-.003	.083	.071	.118	.070	.031
27. television	-.065	.103	-.008	-.078	.014	-.049	-.110	-.005	-.160	-.074	-.178	-.027	.002	.000	-.009	.006	.008	-.022	.059	-.040	-.059	-.070
28. working	-.011	.113	.100	-.175	-.225	-.102	.046	.001	-.048	.008	-.112	-.044	-.006	-.004	-.038	-.056	-.057	-.019	.004	.048	.064	.058
29. partying	-.053	-.083	.071	.009	.082	.083	-.082	.010	-.080	-.006	-.021	-.007	.029	.008	-.013	-.001	.017	.059	.028	-.013	-.028	-.061
30. sleeping	.009	-.102	.045	.046	.020	.073	-.062	.032	-.063	.028	.066	-.016	.015	.015	-.037	-.090	-.082	-.094	-.052	-.072	-.102	-.084
31. oncampus	.021	.005	.003	-.006	-.025	-.011	-.018	.054	.008	-.012	.012	-.010	-.021	-.023	-.041	-.048	-.051	.013	.012	.036	.006	.010
32. high racial importance	.006	.120	.035	-.127	-.014	-.045	.003	.008	-.042	-.028	-.110	.037	.009	.034	.011	.030	.033	.022	.063	.029	.033	.035
33. uncomfortable	-.053	.275	-.049	-.183	-.101	-.084	.054	-.093	-.041	-.001	-.137	-.019	.007	-.004	-.076	.069	.085	.079	.190	.117	.172	.113
34. requestedid	-.018	.014	-.001	-.011	.032	.024	-.133	-.023	-.001	.015	-.006	-.026	.009	-.028	-.019	.008	-.003	.057	.062	.047	.043	-.008
35. students derogatory remarks	-.050	.086	.086	-.142	-.037	-.039	-.030	-.020	-.024	.027	-.020	.000	.039	-.008	-.017	.056	.057	.069	.115	.061	.098	.030
36. professors derogatory remarks	-.038	.056	.042	-.080	-.051	-.033	.007	-.046	.027	-.001	-.068	.016	.022	-.003	-.034	.020	.020	.015	.107	.023	.056	.029
37. harrassment	-.023	.146	-.027	-.097	-.026	-.004	-.044	-.066	-.032	-.017	-.066	.017	.012	.022	-.003	.021	.030	.049	.111	.065	.072	.052

38. harrasment same race	-.057	.188	-.055	-.108	-.024	-.036	.000	-.059	-.067	.008	-.065	-.009	.004	.012	-.063	.043	.047	.072	.127	.083	.106	.062
39. badgraderace	-.032	.125	-.045	-.065	-.048	-.033	-.081	-.056	-.057	-.005	-.061	-.031	.015	.016	-.021	.018	.029	-.010	.087	.054	.049	.006
40. discouraged speaking	-.034	.107	-.036	-.057	-.042	-.032	-.037	-.021	-.035	-.033	-.021	-.012	.013	-.017	-.053	.028	.028	.023	.086	.015	.056	.018
41. discouraged course	-.022	.079	-.019	-.048	.000	-.016	.008	-.033	-.063	-.027	-.032	-.005	.019	-.010	-.025	.014	.014	.041	.066	.069	.046	.049
42. professors of color	.023	.141	-.008	-.108	-.034	.002	.025	.028	-.005	-.108	-.039	.036	.035	.028	.009	.018	.018	.016	.059	.084	.060	.081
43. students of color	-.012	.003	-.007	.003	-.033	-.064	-.025	-.046	.112	-.015	.049	.008	.006	-.006	.009	-.018	-.015	.048	.031	-.067	.026	-.005
44. aidproblems	-.026	.102	.087	-.155	-.181	-.102	.052	-.121	-.031	-.084	-.108	-.001	-.004	-.027	-.060	-.037	-.039	.069	.068	.036	.102	.034
45. aid importance	-.050	.229	.147	-.310	-.476	-.264	.058	-.094	-.002	-.084	-.214	.040	-.002	.002	-.020	-.039	-.024	.017	.097	.094	.126	.065
46. cost importance	-.006	.117	.044	-.133	-.259	-.141	.054	-.077	-.010	-.058	-.187	.023	-.027	-.022	-.004	-.014	-.015	.074	.085	.069	.115	.027
47. parental contribution	.069	-.216	-.104	.263	.448	.259	-.012	.076	.041	.071	.276	-.027	.013	-.043	.004	.072	.062	.036	-.067	-.054	-.096	-.088
48. blach high graduation importance	-.046	.957	-.255	-.568	-.083	-.048	.081	.014	-.186	-.118	-.344	.148	.005	.043	.057	.127	.149	.085	.218	.156	.130	.097
49. hispanic high graduation importance	.010	-.255	.956	-.590	-.099	-.152	.025	-.053	-.025	-.001	-.094	.154	.023	-.014	-.019	.024	.024	.022	.037	.020	.031	.017
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
22. mentor	1.000																					
23. extracurriculars	.041	1.000																				
24. inclass	.018	-.008	1.000																			
25. studying	.072	.016	.170	1.000																		
26. activities	.031	.168	.049	.067	1.000																	
27. television	-.070	-.018	-.015	-.111	.011	1.000																

28. working	.058	-.065	.005	-.003	.047	-.031	1.000															
29. partying	-.061	.161	-.066	-.108	.122	.169	.015	1.000														
30. sleeping	-.084	-.050	-.077	-.142	-.039	.053	-.045	.045	1.000													
31. oncampus	.010	.017	-.008	.028	.010	-.002	-.004	-.007	-.004	1.000												
32. high racial importance	.035	.066	-.055	.006	.031	.035	.051	.076	-.046	-.042	1.000											
33. *uncomfortable*	.113	.003	.038	.044	.033	-.001	.060	-.043	-.056	-.049	.172	1.000										
34. requestedid	-.008	.037	.034	.047	-.003	.004	.023	.109	.011	.015	.053	.085	1.000									
35. students derogatory remarks	.030	.025	.022	.024	.046	-.051	.050	.035	-.019	-.031	.133	.396	.072	1.000								
36. professors derogatory remarks	.029	.022	.042	-.007	.046	-.020	-.006	.016	.007	-.047	.062	.284	.054	.275	1.000							
37. harrassment	.052	.050	.044	.025	.066	-.001	.063	.016	-.065	-.030	.113	.476	.092	.357	.309	1.000						
38. harrasment same race	.062	.028	.062	.048	.079	.011	.036	.059	-.048	-.012	.110	.380	.082	.262	.174	.346	1.000					
39. badgraderace	.006	.005	.068	-.033	-.004	.033	-.001	.039	.005	-.025	.078	.333	.112	.154	.286	.304	.275	1.000				
40. discouraged speaking	.018	-.001	.045	-.009	.037	.026	-.011	-.020	.013	-.044	.054	.345	.090	.208	.336	.329	.230	.455	1.000			
41. discouraged course	.049	.033	.016	.025	.048	-.041	.007	-.005	-.043	-.023	.015	.218	.060	.123	.153	.162	.168	.178	.251	1.000		
42. professors of color	.081	.040	.003	-.040	.032	.023	.009	.013	-.055	-.052	-.011	.056	-.009	.018	.015	.023	.047	.021	.038	.039	1.000	
43. students of color	-.005	-.092	.017	-.001	.035	-.049	.005	-.074	.007	-.109	-.095	-.068	.025	-.019	.031	-.017	-.039	-.052	.019	-.017	.212	1.000
44. aidproblems	.034	-.041	-.007	.031	-.019	-.033	.168	-.023	-.011	.014	.110	.138	.028	.145	.042	.103	.111	.037	.022	.066	.029	.012
45. aid importance	.065	-.116	.029	.089	.020	.011	.309	-.083	-.022	.040	.080	.125	.022	.080	.054	.065	.088	.043	.041	.020	.029	.004

46. cost importance	.027	-.113	.054	.097	.019	.059	.136	-.055	-.031	-.041	.036	.088	-.023	.042	.038	.039	.072	.026	-.003	.020	-.031	.004
47. parental contribution	-.088	.070	-.018	-.061	-.005	-.067	-.207	.124	.034	.058	-.072	-.106	.013	-.047	-.046	-.045	-.043	-.022	-.005	-.034	-.045	-.066
48. blach high graduation importance	.097	-.038	.002	.012	.023	.082	.101	-.075	-.114	.022	.133	.254	.019	.078	.050	.139	.177	.115	.095	.075	.136	-.008
49. hispanic high graduation importance	.017	-.026	.007	.025	-.006	-.008	.079	.062	.041	-.004	.030	-.055	-.014	.086	.036	-.037	-.057	-.052	-.034	-.036	.000	-.008

APPENDIX 3

Correlations H3 and H4

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	Total	1.000																			
2.	Black	.713	1.000																		
3.	Hispanic	.675	.514	1.000																	
4.	White/Asian	.831	.579	.593	1.000																
5.	Remedial	-.459	-.422	-.368	-.385	1.000															
6.	SATvt75	.762	.565	.557	.686	-.469	1.000														
7.	SATmt75	.757	.546	.550	.674	-.457	.927	1.000													
8.	Distance Learning	-.360	-.246	-.262	-.310	.267	-.364	-.298	1.000												
9.	Study Abroad	.243	.163	.173	.207	-.132	.229	.196	-.036	1.000											
10.	Weekend Classes	-.259	-.166	-.195	-.203	.150	-.256	-.259	.236	-.040	1.000										
11.	Per Capita Academic Support Log	.402	.301	.300	.367	-.196	.406	.390	-.178	.127	-.183	1.000									
12.	ROTC	.100	.098	.073	.072	-.035	.074	.147	.175	.132	.081	.033	1.000								
13.	Employment Services	.048	.016	.028	.034	.033	.021	.045	.046	.208	.010	.031	.142	1.000							
14.	Placement Services	.044	.076	.002	.025	.004	.028	.067	.066	.084	-.002	.048	.112	.354	1.000						
15.	Per Capita Student Services Log	.405	.282	.234	.334	-.139	.311	.252	-.410	.052	-.122	.236	-.178	-.068	-.085	1.000					
16.	Percent Black Students	-.335	-.136	-.251	-.306	.162	-.354	-.371	.146	-.145	.189	-.074	.025	-.023	-.015	-.141	1.000				
17.	Percent Hispanic Students	-.173	-.109	-.022	-.104	.086	-.176	-.148	.033	-.006	.024	-.010	-.061	.021	.053	-.087	-.007	1.000			
18.	Percent White/Asian Students	.246	.096	.118	.172	-.133	.265	.251	-.089	.087	-.151	-.006	-.001	-.025	-.044	.063	-.657	-.522	1.000		
19.	Percent Financial Aid	-.233	-.226	-.243	-.233	.174	-.292	-.335	.034	-.092	.183	-.156	-.125	-.082	-.096	.195	.120	-.128	.043	1.000	
20.	Percent Pell Grant	-.637	-.456	-.445	-.551	.390	-.643	-.640	.230	-.210	.198	-.258	-.187	-.014	-.041	-.189	.519	.280	-.457	.342	1.000
21.	Average Pell Grant	-.053	.007	-.029	-.019	-.012	-.042	-.013	.027	.058	-.022	.135	.035	.100	.095	-.090	.223	.243	-.363	-.184	.160
22.	Percent Institutional Grant Aid	.129	.022	.023	.097	.060	.029	-.023	-.197	-.029	.071	.007	-.150	-.068	-.088	.553	-.135	-.099	.105	.666	.032
23.	Average Institutional Grant Aid	.662	.525	.461	.575	-.339	.614	.569	-.443	.118	-.113	.350	-.054	-.006	-.016	.635	-.181	-.102	.018	-.084	-.399
24.	Percent Loan Aid	-.159	-.182	-.233	-.184	.255	-.337	-.386	.034	-.081	.153	-.185	-.132	-.062	-.105	.264	.096	-.223	.076	.638	.289
25.	Average Loan Aid	.078	.019	.015	.062	.055	-.028	-.035	.013	.026	.085	.022	.026	.039	-.025	.258	.000	-.124	.007	.268	-.072
26.	Per Capita Endowment Log	.550	.408	.376	.470	-.309	.536	.511	-.368	.162	-.151	.319	-.002	.001	-.025	.479	-.166	-.107	.138	-.002	-.362
27.	Mideast	.159	.104	.062	.142	.020	-.013	.009	.011	.043	.009	.074	-.026	.050	.021	.084	.056	-.019	-.093	.002	.015
28.	Great Lakes	.059	-.048	-.011	.060	-.005	.066	.057	-.061	.013	.032	-.042	-.074	.019	.052	.032	-.078	-.140	.164	.132	-.016

29.	Plains	-.012	-.104	-.073	-.021	.009	.073	.068	.011	.023	.001	-.085	-.019	-.008	-.082	.056	-.110	-.124	.182	.171	-.001
30.	Southeast	-.159	-.006	-.075	-.160	-.077	-.070	-.098	.045	-.086	.052	-.028	.072	-.091	-.080	-.131	.293	-.175	.005	.078	.071
31.	Southwest	-.169	-.103	-.059	-.142	.092	-.083	-.061	.057	-.053	-.010	-.026	.003	-.015	.032	-.088	.031	.383	-.171	-.028	.122
32.	Rocky Mountains	-.064	-.035	-.039	-.065	.027	.003	.004	.060	-.023	.004	-.043	.060	.028	-.015	-.146	-.101	-.002	.079	-.128	-.055
33.	Far West	.013	-.024	.056	.039	.007	.020	.025	-.069	.070	-.118	.028	-.002	.046	.055	.031	-.152	.266	-.113	-.218	-.039
34.	Public	-.308	-.200	-.155	-.254	.068	-.213	-.130	.335	.019	-.049	-.056	.202	.071	.118	-.723	.110	.102	-.034	-.401	.116
35.	Suburb	.015	.069	.043	.066	-.045	.084	.096	.048	.050	.098	.066	.125	.102	.057	-.085	.099	.108	-.188	-.110	-.024
36.	Town	.129	.067	.074	.121	-.003	.034	.015	-.053	.034	.019	.017	.004	-.007	.033	.086	-.038	.018	-.014	-.011	-.084
37.	Rural	-.135	-.104	-.112	-.143	.074	-.122	-.125	-.006	-.119	.008	-.046	-.062	-.069	-.127	.028	-.026	-.018	.060	.092	.054
38.	Cost in State	.586	.438	.388	.509	-.262	.483	.419	-.448	.095	-.057	.271	-.120	-.024	-.046	.732	-.214	-.106	.050	.141	-.372
39.	Cost out of State	.719	.562	.512	.635	-.371	.615	.579	-.439	.173	-.126	.396	-.013	.019	.010	.605	-.253	-.086	.052	-.074	-.509
40.	Books and Supplies	-.061	-.033	-.027	-.046	.021	-.064	-.048	.038	-.027	.008	-.025	.017	.049	.033	-.052	.102	.142	-.178	-.080	.063
41.	Institutional Size	.087	.094	.115	.107	-.078	.132	.251	.312	.134	-.001	.125	.383	.137	.169	-.501	-.006	.135	-.098	-.464	-.187

APPENDIX 4

Full Regression Tables for Chapter 4

Table 4.2 Regression Results for the Effects of Reflection of Students' Academic Preparation on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	1212	1212
F	471.34***	146.86***
R-Squared	.539	.648
Remedial	-4.846*** (.819)	-3.451*** (.741)
SAT Verbal 75	.086*** (.012)	.060*** (.012)
SAT Math 75	.083*** (.012)	.054*** (.012)
Mideast		2.296* (1.165)
Great Lakes		-1.600 (1.279)
Plains		-2.504 (1.464)
Southeast		-3.363*** (.768)
Southwest		-5.224*** (1.222)
Rocky mountains		-5.287** (1.807)
Far West		-3.213** (1.042)
Public		-4.444** (1.668)
City		-2.219** (.813)
Suburb		-.019 (.922)
Rural		-2.058 (1.171)
Cost in- State		.000 (.000)
Cost out -of -State		.001*** (.000)
Books and Supplies		.000 (.001)
Institutional Size		1.070** (.371)
Constant	-40.885*** (3.588)	-22.906*** (3.592)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.3: Regression Results for the Effect of Programs that Support Students' Commitment to Educational Goals on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	2035	2035
F	123.99***	73.24***
R-Squared	.196	.409
Distance Learning	-9.935*** (.891)	-4.401*** (.855)
Study Abroad	11.370*** (.876)	1.637 (.961)
Weekend Classes	-6.834*** (.841)	-6.218*** (.749)
Per Capita Academic Support (log)	1.329*** (.221)	.052 (.200)
Mideast		2.900 (1.530)
Great Lakes		-1.841 (1.552)
Plains		4.014* (1.678)
Southeast		-1.835 (1.496)
Southwest		-4.022* (1.872)
Rocky mountains		-2.547 (2.269)
Far West		-.398 (1.661)
Public		-10.422*** (1.918)
City		-.905 (1.017)
Suburb		-.186 (1.163)
Rural		-2.471 (1.367)
Cost in- State		-.001*** (.000)
Cost out -of -State		.002*** (.000)
Books and Supplies		-.001* (.001)
Institutional Size		1.626*** (.446)
Constant	42.545*** (1.801)	33.883*** (2.381)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.4: Regression Results for the Effects of Opportunities for Social And Academic Integration on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	1720	1720
F	41.40***	63.86***
R-Squared	.088	.417
ROTC	4.831*** (.955)	1.735* (.857)
Employment Services	.257 (1.855)	-3.482* (1.546)
Placement Services	1.306 (1.459)	-.161 (1.195)
Per Capita Student Services (log)	3.421*** (.298)	-.326 (.290)
Mideast		3.068* (1.524)
Great Lakes		-1.554 (1.565)
Plains		3.328 (1.737)
Southeast		-2.048 (1.518)
Southwest		-3.930* (1.935)
Rocky mountains		-2.456 (2.600)
Far West		.936 (1.732)
Public		-12.036*** (1.946)
City		-1.936 (1.017)
Suburb		-.748 (1.196)
Rural		-3.416* (1.382)
Cost in- State		-.001*** (.000)
Cost out -of -State		.002*** (.000)
Books and Supplies		-.004*** (.001)
Institutional Size		1.435** (.483)
Constant	23.692*** (2.497)	37.341*** (2.920)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.5: Regression Results for the Effects of Racial Composition of Campus on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	2091	2091
F	62.59***	75.37***
R-Squared	.083	.396
Percentage Black Students	-.188 (.035)	.016 (.032)
Percentage Hispanic Students	-.079 (.051)	.063 (.043)
Percentage White and Asian Students	.098 (.032)	.174*** (.027)
Mideast		3.604* (1.511)
Great Lakes		-2.837 (1.566)
Plains		2.133 (1.684)
Southeast		-.316 (1.536)
Southwest		-2.484 (1.915)
Rocky mountains		-4.750* (2.275)
Far West		.578 (1.688)
Public		-9.636*** (1.841)
City		-.669 (1.015)
Suburb		-.714 (1.142)
Rural		-2.291 (1.350)
Cost in- State		-.001*** (.000)
Cost out -of -State		.002*** (.000)
Books and Supplies		-.001 (.001)
Institutional Size		1.151** (.416)
Constant	46.282*** (2.815)	15.235*** (3.168)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.6: Regression Results for the Effects of Financial Characteristics of Institution on Graduation Rates		
	Total Graduation Rate	
	Model 1	Model 2
N	1535	1535
F	211.74***	90.64***
R-Squared	.526	.580
Percent Financial Aid	-.029 (.038)	.027 (.039)
Percent Pell Grant	-.418*** (.025)	-.338*** (.027)
Average Pell Grant	-.001 (.001)	.000 (.001)
Percent Institutional Grant Aid	-.043* (.018)	-.075*** (.019)
Average Institutional Grant Aid	.001*** (.000)	.001*** (.000)
Percent Loan Aid	.071*** (.022)	.017 (.022)
Average Loan Aid	.000 (.000)	.000* (.000)
Per Capita Endowment (log)	1.491*** (.164)	1.417*** (.161)
Mideast		3.486** (1.283)
Great Lakes		-.604 (1.328)
Plains		2.503 (1.482)
Southeast		-3.607** (1.321)
Southwest		-4.224** (1.691)
Rocky mountains		-5.720** (2.230)
Far West		-1.372 (1.530)
Public		-13.573*** (1.888)
City		-1.420 (.858)
Suburb		-.804 (1.000)
Rural		-1.921 (1.182)
Cost in- State		-.001*** (.000)
Cost out -of -State		.001*** (.000)

Books and Supplies		-.001 (.001)
Institutional Size		1.033** (.391)
Constant	46.285*** (3.727)	45.347*** (4.251)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.7: Effect of Institutional Resources on Total Graduation Rate Controlling for Students' Financial Capital	
Academic Preparation	
N	1212.000
F	122.55***
R-Squared	.661
Remedial	-3.411*** (.730)
SAT Verbal 75	.058*** (.012)
SAT Math 75	.048*** (.012)
Percent Pell Grant	-.119*** (.029)
Mideast	2.296* (1.165)
Great Lakes	-1.600 (1.279)
Plains	-2.504 (1.464)
Southeast	-3.363*** (.768)
Southwest	-5.224*** (1.222)
Rocky mountains	-5.287** (1.807)
Far West	-3.213** (1.042)
Public	-4.444** (1.668)
City	-2.219** (.813)
Suburb	-.019 (.922)
Rural	-2.058 (1.171)
Cost in- State	.000 (.000)
Cost out -of -State	.001*** (.000)
Books and Supplies	.000 (.001)
Institutional Size	1.070** (.371)
_cons	-11.547** (4.532)
Commitment to Educational Goals	
N	2028.000

F	77.03***
R-Squared	.434
Distance Learning	-3.815*** (.837)
Study Abroad	.412 (.951)
Weekend Classes	-5.511*** (.738)
Per Capita Academic Support (log)	.052 (.197)
Percent Pell Grant	-.181*** (.022)
Mideast	2.900 (1.530)
Great Lakes	-1.841 (1.552)
Plains	4.014* (1.678)
Southeast	-1.835 (1.496)
Southwest	-4.022* (1.872)
Rocky mountains	-2.547 (2.269)
Far West	-.398 (1.661)
Public	-10.422*** (1.918)
City	-.905 (1.017)
Suburb	-.186 (1.163)
Rural	-2.471 (1.367)
Cost in- State	-.001*** (.000)
Cost out -of -State	.002*** (.000)
Books and Supplies	-.001* (.001)
Institutional Size	1.626*** (.446)
_cons	43.722*** (2.637)
Social and Academic Integration	
N	1713.000
F	75.92***
R-Squared	.473
ROTC	1.327 (.813)
Employment Services	-3.132* (1.469)

Placement Services	.542 (1.134)
Per Capita Student Services (log)	-.293 (.280)
Percent Pell Grant	-.301*** (.024)
Mideast	3.068* (1.524)
Great Lakes	-1.554 (1.565)
Plains	3.328 (1.737)
Southeast	-2.048 (1.518)
Southwest	-3.930* (1.935)
Rocky mountains	-2.456 (2.600)
Far West	.936 (1.732)
Public	-12.036*** (1.946)
City	-1.936 (1.017)
Suburb	-.748 (1.196)
Rural	-3.416* (1.382)
Cost in- State	-.001*** (.000)
Cost out -of -State	.002*** (.000)
Books and Supplies	-.004*** (.001)
Institutional Size	1.435** (.483)
_cons	53.683*** (3.135)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.8: Effect of Institutional Resources on Total Graduation Rate with Students' Financial Capital Moderating						
N	1215.000	1212.000	1215.000	1212.000	1215.000	1212.000
F	308.14***	116.52***	340.52***	123.48***	353.61***	127.51***
R2	.560	.661	.585	.674	.594	.681
Remedial	-7.764*** (1.620)	-4.904*** (1.476)	-3.110*** (.797)	-2.683*** (.723)	-2.982*** (.786)	-2.589*** (.714)
satvr75	.071*** (.012)	.057*** (.012)	.143*** (.014)	.111*** (.014)	.062*** (.012)	.049*** (.011)
Satmt75	.067*** (.012)	.048*** (.012)	.059*** (.012)	.046*** (.012)	.146*** (.014)	.117*** (.014)
Percent Pell Grant	-.320*** (.057)	-.169*** (.052)	1.208*** (.164)	.931*** (.153)	1.389*** (.158)	1.138*** (.147)
Remedial *Pell Grant	.138* (.059)	.061 (.052)				
Satvr75* Pell Grant			-.003*** (.000)	-.002*** (.000)		
SAT MT 75* Pell Grant					-.003*** (.000)	-.002*** (.000)
Mideast		3.228** (1.162)		3.255** (1.140)		3.406** (1.127)
Great Lakes		-1.449 (1.281)		-1.261 (1.256)		-1.064 (1.243)
Plains		-2.411 (1.460)		-2.394 (1.432)		-2.360 (1.416)
Southeast		-3.060** (1.193)		-3.651** (1.173)		-3.659** (1.159)
Southwest		-4.926*** (1.534)		-5.704*** (1.508)		-5.571*** (1.489)
Rocky mountains		-5.699** (2.010)		-6.173** (1.972)		-6.171** (1.951)
Far West		-2.717* (1.349)		-2.791* (1.323)		-2.503 (1.309)
Public		-6.976*** (1.690)		-8.576*** (1.674)		-8.614*** (1.651)
City		-2.525** (.805)		-2.524*** (.789)		-2.526*** (.781)
Suburb		-1.095 (.923)		-1.076 (.905)		-1.124 (.895)
Rural		-2.500* (1.157)		-2.384* (1.135)		-2.522* (1.122)
Cost in- State		.000** (.000)		.000*** (.000)		.000*** (.000)
Cost out -of -State		.001*** (.000)		.001*** (.000)		.001*** (.000)
Books and Supplies		.000 (.001)		.000 (.001)		.000 (.001)
Institutional Size		.995** (.368)		.898* (.361)		.760* (.357)
_cons	-15.050** (5.094)	-9.766* (4.783)	-53.790*** (6.135)	-36.752*** (5.732)	-57.063*** (5.926)	-40.855*** (5.538)

Table 4.8: Effect of Institutional Resources on Total Graduation Rate with Students' Financial Capital Moderating								
N	2052.000	2028.000	2052.000	2028.000	2052.000	2028.000	2052.000	2028.000
F	131.22***	73.42***	163.28***	77.83***	136.45***	73.93***	136.45***	74.26***
R-Squared	.278	.435	.324	.449	.286	.436	.286	.437
Distance Learning	-11.320*** (1.597)	-2.410 (1.579)	-8.440*** (.820)	-3.558*** (.827)	-8.659*** (.845)	-3.698*** (.837)	-8.723*** (.843)	-3.679*** (.836)
Study Abroad	5.012*** (.917)	.341 (.954)	24.586*** (1.873)	13.081*** (1.970)	4.850*** (.911)	.454 (.950)	4.586*** (.913)	.456 (.949)
Weekend Classes	-4.724*** (.808)	-5.509*** (.738)	-4.142*** (.783)	-5.097*** (.731)	-12.029*** (1.650)	-9.035*** (1.501)	-4.585*** (.803)	-5.446*** (.736)
Per Capita Academic Support (log)	1.142*** (.210)	.058 (.197)	.960*** (.203)	.049 (.194)	1.105*** (.208)	.042 (.197)	2.764*** (.372)	1.049** (.357)
Percent Pell Grant	-.375*** (.032)	-.157*** (.032)	-.079** (.030)	-.048 (.028)	-.428*** (.028)	-.229*** (.028)	-.068 (.056)	-.026 (.051)
Distance Learning* Pell Grant	.066 (.039)	-.039 (.037)						
Study Abroad* Pell Grant			-.495*** (.042)	-.295*** (.040)				
Weekend Classes* Pell Grant					.197*** (.039)	.096** (.035)		
Per Capita Academic Support (log)* Pell Grant							-.039*** (.008)	-.023*** (.007)
Mideast		3.583* (1.498)		3.639* (1.479)		3.558* (1.496)		3.664* (1.494)
Great Lakes		-1.196 (1.516)		-1.275 (1.496)		-1.248 (1.513)		-1.333 (1.512)
Plains		4.230** (1.638)		3.603* (1.618)		4.135** (1.635)		4.262** (1.633)
Southeast		-.602 (1.468)		-.709 (1.446)		-.741 (1.463)		-.672 (1.461)
Southwest		-3.116 (1.835)		-3.302 (1.805)		-3.375 (1.826)		-3.256 (1.824)
Rocky mountains		-2.051 (2.218)		-2.750 (2.187)		-2.429 (2.212)		-2.170 (2.209)
Far West		-.681 (1.624)		-.356 (1.603)		-.772 (1.620)		-.725 (1.619)
Public		-11.140*** (1.898)		-11.714*** (1.855)		-11.441*** (1.876)		-11.525*** (1.875)
City		-.570 (.994)		-.661 (.981)		-.500 (.992)		-.538 (.991)
Suburb		-.649 (1.137)		-.829 (1.122)		-.640 (1.135)		-.609 (1.134)
Rural		-2.345 (1.334)		-2.193 (1.317)		-2.222 (1.333)		-2.436 (1.330)
Cost in- State		-.001*** (.000)		-.001*** (.000)		-.001*** (.000)		-.001*** (.000)

Cost out -of -State		.002*** (.000)		.002*** (.000)		.002*** (.000)		.002*** (.000)
Books and Supplies		-.001 (.001)		-.001 (.001)		-.001 (.001)		-.001 (.001)
Institutional Size		1.010* (.445)		.674 (.438)		1.108** (.439)		.989* (.440)
_cons	60.050*** (2.169)	42.663*** (2.823)	46.913*** (2.158)	39.014*** (2.681)	61.919*** (2.083)	45.519*** (2.716)	47.478*** (2.926)	37.531*** (3.218)

Table 4.8: Effect of Institutional Resources on Total Graduation Rate with Students' Financial Capital Moderating								
N	1720.000	1713.000	1720.000	1713.000	1720.000	1713.000	1720.000	1713.000
F	135.27***	74.22***	138.04***	74.60***	136.85***	74.94***	142.15***	74.87***
R-Squared	.321	.480	.326	.481	.324	.482	.332	.482
ROTC	10.873*** (1.638)	7.505*** (1.554)	1.176 (.835)	1.287 (.807)	1.252 (.835)	1.315 (.806)	1.948* (.830)	1.453 (.807)
Employment Services	-1.986 (1.618)	-2.606 (1.4650)	12.702*** (2.627)	6.523** (2.394)	-.533 (1.641)	-1.532 (1.486)	-2.594 (1.601)	-2.789 (1.459)
Placement Services	.902 (1.259)	.682 (1.128)	1.294 (1.257)	.946 (1.129)	12.517*** (2.075)	8.706*** (1.874)	.542 (1.249)	.477 (1.125)
Per Capita Student Services (log)	2.637*** (.260)	-.216 (.279)	2.490*** (.259)	-.283 (.278)	2.485*** (.259)	-.307 (.278)	6.090*** (.486)	2.191*** (.539)
Percent Pell Grant	-.394*** (.029)	-.230*** (.028)	-.212*** (.047)	-.121** (.042)	-.263*** (.042)	-.135*** (.039)	.193* (.086)	.126 (.083)
ROTC* Pell Grant	-.297*** (.045)	-.190*** (.041)						
Employment Services* Pell Grant			-.393*** (.053)	-.244*** (.048)				
Placement Services* Pell Grant					-.349*** (.049)	-.240*** (.044)		
Per Capita Student Services (log)* Pell Grant							-.102*** (.012)	-.063*** (.012)
Mideast		4.054** (1.441)		3.841** (1.439)		4.068** (1.437)		4.100** (1.438)
Great Lakes		-.835 (1.475)		-.907 (1.473)		-.836 (1.472)		-.986 (1.472)
Plains		2.717 (1.637)		2.666 (1.635)		2.637 (1.633)		2.738 (1.633)
Southeast		-.735 (1.434)		-.932 (1.430)		-.799 (1.429)		-1.010 (1.429)
Southwest		-3.125 (1.824)		-2.889 (1.822)		-2.936 (1.820)		-3.303 (1.820)
Rocky mountains		-4.852* (2.455)		-4.704 (2.451)		-4.265 (2.447)		-4.317 (2.448)
Far West		.172		-.074		.094		.073

		(1.635)		(1.633)		(1.631)		(1.632)
Public		-13.325*** (1.854)		-13.790*** (1.845)		-13.688*** (1.843)		-15.126*** (1.851)
City		-1.498 (.959)		-1.616 (.958)		-1.518 (.956)		-1.482 (.957)
Suburb		-1.940 (1.131)		-1.918 (1.129)		-1.930 (1.128)		-1.937 (1.128)
Rural		-2.906* (1.302)		-2.911* (1.300)		-2.758* (1.299)		-2.982* (1.299)
Cost in-State		-.001*** (.000)		-.001*** (.000)		-.001*** (.000)		-.001*** (.000)
Cost out -of -State		.002*** (.000)		.002*** (.000)		.002*** (.000)		.002*** (.000)
Books and Supplies		-.003** (.001)		-.002** (.001)		-.003** (.001)		-.003*** (.001)
Institutional Size		.386 (.466)		.499 (.461)		.454 (.461)		.839 (.458)
_cons	45.579*** (2.624)	50.210*** (3.204)	38.883*** (2.978)	46.232*** (3.440)	41.125*** (2.85)6	46.846*** (3.352)	26.111*** (3.840)	37.294*** (4.356)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.9 Regression Results for the Effects of Reflection of Students' Academic Preparation on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1133	1133	1041	1041	1212	1212
F	162.85***	46.76***	148.64***	37.54***	315.32***	89.22***
R-Squared	.302	.381	.301	.355	.439	.528
Remedial	-10.324*** (1.442)	-7.442*** (1.410)	-6.689*** (1.568)	-4.705** (1.558)	-3.345** (1.159)	-1.569 (1.101)
SAT Verbal 75	.112*** (.023)	.078*** (.023)	.115*** (.025)	.089*** (.026)	.075*** (.018)	.064*** (.017)
SAT Math 75	.037 (.022)	-.007 (.023)	.062* (.025)	.022 (.026)	.129*** (.017)	.065*** (.018)
Mideast		-1.824 (2.237)		-3.727 (2.402)		3.975* (1.728)
Great Lakes		-10.763*** (2.454)		-8.033** (2.662)		-1.182 (1.898)
Plains		-12.572*** (2.845)		-11.053*** (3.076)		-2.875 (2.172)
Southeast		3.396* (1.460)		.797 (1.692)		-2.686* (1.140)
Southwest		.863 (2.305)		2.354 (2.442)		-4.402* (1.814)
Rocky mountains		-2.140 (3.764)		-4.633 (3.648)		-5.441* (2.683)
Far West		-5.231** (2.014)		1.375 (2.090)		-1.202 (1.547)
Public		2.652 (3.200)		1.695 (3.603)		3.010 (2.477)
City		.318 (1.549)		-2.006 (1.760)		-1.118 (1.208)
Suburb		.970 (1.770)		.985 (1.968)		1.346 (1.370)
Rural		-2.496 (2.278)		-5.355* (2.689)		-1.371 (1.740)
Cost in-State		.000 (.000)		.000 (.000)		.000 (.000)
Cost out -of -State		.001*** (.000)		.001*** (.000)		.001*** (.000)
Books and Supplies		.001 (.002)		-.001 (.002)		-.001 (.001)
Institutional Size		1.644* (.731)		1.737* (.780)		2.247*** (.551)
Constant	-35.130*** (6.265)	-24.945*** (6.825)	-52.544*** (7.108)	-39.076*** (7.716)	-64.831*** (5.076)	-47.110*** (5.335)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.10: Regression Results for the Effect of Programs that Support Students' Commitment to Educational Goals on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1751	1751	1574	1574	2035	2035
F	69.36***	44.46***	73.84***	36.85***	114.45***	79.16***
R-Squared	.137	.328	.158	.311	.184	.427
Distance Learning	-9.793*** (1.286)	-2.820* (1.278)	-11.745*** (1.423)	-4.829*** (1.466)	-5.217*** (1.076)	-.056 (1.008)
Study Abroad	13.256*** (1.295)	-.287 (1.430)	13.034*** (1.458)	-.355 (1.642)	16.637*** (1.057)	.997 (1.132)
Weekend Classes	-4.348*** (1.162)	-2.809** (1.078)	-6.619*** (1.278)	-4.610*** (1.214)	-6.043*** (1.015)	-4.764*** (.883)
Per Capita Academic Support (log)	2.643*** (.407)	.333 (.379)	3.267*** (.474)	.963* (.455)	2.415*** (.267)	.693** (.235)
Mideast		-1.510 (2.244)		-2.852 (2.392)		4.239* (1.803)
Great Lakes		-9.141*** (2.281)		-4.385 (2.475)		.951 (1.828)
Plains		-6.793** (2.500)		-1.951 (2.752)		6.059** (1.977)
Southeast		.995 (2.208)		.835 (2.401)		.500 (1.762)
Southwest		-5.743* (2.710)		.057 (2.861)		.489 (2.206)
Rocky mountains		-7.746* (3.588)		-.446 (3.432)		.871 (2.674)
Far West		-6.863** (2.470)		.312 (2.565)		3.442 (1.957)
Public		-3.127 (2.776)		3.449 (3.144)		-.597 (2.260)
City		.633 (1.448)		-.884 (1.653)		-.260 (1.199)
Suburb		.073 (1.652)		.891 (1.873)		.924 (1.371)
Rural		-1.549 (2.041)		-4.417 (2.414)		-3.769* (1.611)
Cost in-State		.000 (.000)		.000 (.000)		.000 (.000)
Cost out -of -State		.002*** (.000)		.001*** (.000)		.002*** (.000)
Books and Supplies		-.002* (.001)		-.002 (.001)		-.002* (.001)
Institutional Size		2.308*** (.626)		3.223*** (.683)		3.288*** (.525)
Constant	19.565*** (3.445)	11.466** (4.213)	20.899*** (4.031)	6.306 (4.927)	23.347*** (2.173)	4.486 (2.806)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.11: Regression Results for the Effects of Opportunities for Social And Academic Integration on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1485	1485	1344	1344	1720	1720
F	42.80***	41.15***	36.83***	33.03***	65.91***	77.04***
R-Squared	.104	.348	.099	.322	.133	.463
ROTC	8.228*** (1.286)	2.965* (1.212)	6.889*** (1.411)	.740 (1.353)	8.059*** (1.135)	1.262 (1.003)
Employment Services	-3.494 (3.025)	-6.486* (2.626)	7.581* (3.532)	4.357 (3.115)	9.375*** (2.205)	1.505 (1.809)
Placement Services	6.110** (2.143)	4.233* (1.863)	1.311 (2.348)	-2.446 (2.082)	3.925* (1.735)	-.135 (1.398)
Per Capita Student Services (log)	5.183*** (.467)	.178 (.541)	5.865*** (.540)	.813 (.676)	3.883*** (.355)	.342 (.339)
Mideast		-1.577 (2.273)		-3.015 (2.422)		4.169* (1.784)
Great Lakes		-9.319*** (2.331)		-5.138* (2.521)		.435 (1.831)
Plains		-7.579** (2.624)		-1.896 (2.811)		4.130* (2.032)
Southeast		.262 (2.267)		.654 (2.467)		-.109 (1.776)
Southwest		-5.659* (2.839)		.771 (3.005)		-.338 (2.264)
Rocky mountains		-6.965 (3.993)		-3.800 (3.964)		-1.326 (3.042)
Far West		-8.223** (2.602)		.552 (2.705)		1.969 (2.027)
Public		-3.141 (2.894)		5.379 (3.272)		-.472 (2.277)
City		-.396 (1.468)		-3.001 (1.668)		-1.710 (1.190)
Suburb		-1.189 (1.723)		-1.044 (1.936)		-.676 (1.400)
Rural		-2.341 (2.110)		-6.168* (2.493)		-5.160*** (1.616)
Cost in-State		.000 (.000)		.000 (.000)		.000 (.000)
Cost out -of -State		.002*** (.000)		.001*** (.000)		.002*** (.000)
Books and Supplies		-.002 (.001)		-.001 (.001)		-.003** (.001)
Institutional Size		2.108** (.693)		3.449*** (.762)		3.770*** (.566)
Constant	-2.664 (4.242)	10.090 (5.353)	-9.616* (4.960)	-5.889 (6.434)	3.671 (2.968)	4.760 (3.417)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.12: Regression Results for the Effects of Racial Composition of Campus on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1802	1802	1619	1619	2091	2091
F	6.53**	48.62***	24.40***	39.79***	73.53***	90.29***
R-Squared	.011	.329	.043	.309	.096	.440
Percentage Black Students	-.109* (.054)	.267*** (.050)	-.373*** (.064)	-.033 (.061)	-.345*** (.042)	-.101** (.037)
Percentage Hispanic Students	-.139 (.075)	.197** (.065)	.012 (.076)	.309*** (.069)	.015 (.060)	.164*** (.050)
Percentage White and Asian Students	.000 (.051)	.197*** (.046)	-.011 (.054)	.093 (.050)	.036 (.038)	.115*** (.032)
Mideast		-2.389 (2.203)		-2.796 (2.349)		4.890** (1.744)
Great Lakes		-10.388*** (2.295)		-4.460 (2.480)		.653 (1.807)
Plains		-7.641** (2.508)		-2.723 (2.761)		5.190** (1.943)
Southeast		-.839 (2.232)		1.934 (2.425)		3.654* (1.772)
Southwest		-6.116* (2.748)		-2.415 (2.887)		.141 (2.209)
Rocky mountains		-7.500* (3.560)		-2.528 (3.424)		-.575 (2.625)
Far West		-6.482** (2.487)		-1.340 (2.570)		2.951 (1.948)
Public		-3.439 (2.662)		3.626 (2.995)		-.068 (2.124)
City		-.252 (1.434)		-2.123 (1.632)		.410 (1.171)
Suburb		-.240 (1.604)		-.439 (1.828)		.917 (1.318)
Rural		-2.194 (1.993)		-5.347* (2.362)		-3.118* (1.558)
Cost in-State		.000 (.000)		.000 (.000)		.000 (.000)
Cost out - of -State		.002*** (.000)		.001*** (.000)		.002*** (.000)
Books and Supplies		-.002* (.001)		-.002* (.001)		-.001* (.001)
Institutional Size		2.603*** (.592)		2.672*** (.641)		3.056*** (.480)
Constant	41.814*** (4.519)	-10.522* (5.101)	47.740*** (4.743)	-2.585 (5.472)	47.623*** (3.348)	-1.187 (3.655)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.13: Regression Results for the Effects of Financial Characteristics of Institution on Graduation Rates						
	Black Gradation Rate		Hispanic Graduation Rate		White/Asian Graduation Rate	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
N	1400	1400	1281	1281	1535	1535
F	85.42***	37.58***	75.86***	31.41***	152.13***	66.98***
R-Squared	.329	.386	.323	.365	.444	.505
Percent Financial Aid	.018 (.065)	.026 (.066)	-.042 (.069)	-.008 (.072)	.008 (.052)	.042 (.053)
Percent Pell Grant	-.335*** (.043)	-.220*** (.048)	-.438*** (.051)	-.272*** (.056)	-.561*** (.034)	-.384*** (.037)
Average Pell Grant	.003* (.001)	.002* (.001)	-.001 (.002)	-.002 (.002)	.000 (.001)	-.001 (.001)
Percent Institutional Grant Aid	-.102*** (.030)	-.078* (.033)	-.020 (.033)	.003 (.039)	-.034 (.024)	.010 (.027)
Average Institutional Grant Aid	.002*** (.000)	.001*** (.000)	.001*** (.000)	.000 (.000)	.001*** (.000)	.001*** (.000)
Percent Loan Aid	.027 (.037)	-.004 (.040)	-.133*** (.040)	-.167*** (.043)	-.003 (.030)	-.023 (.031)
Average Loan Aid	.000 (.000)	-.001** (.000)	.000 (.000)	-.001 (.000)	.000 (.000)	-.001* (.000)
Per Capita Endowment (log)	1.358*** (.273)	1.137*** (.273)	1.173*** (.292)	1.125*** (.294)	.911*** (.224)	1.068*** (.220)
Mideast		-1.668 (2.243)		-2.231 (2.389)		5.053** (1.752)
Great Lakes		-10.659*** (2.336)		-5.660* (2.502)		.315 (1.813)
Plains		-8.389** (2.654)		-4.317 (2.826)		.728 (2.023)
Southeast		-3.279 (2.336)		-3.779 (2.544)		-2.501 (1.803)
Southwest		-7.166* (2.929)		-2.644 (3.088)		-3.267 (2.308)
Rocky mountains		-10.025* (4.132)		-10.657** (4.066)		-5.472 (3.044)
Far West		-10.679*** (2.710)		-4.358 (2.831)		.146 (2.089)
Public		-10.590*** (3.263)		.280 (3.716)		-2.003 (2.578)
City		.122 (1.463)		-2.214 (1.650)		.122 (1.171)
Suburb		-.635 (1.701)		-.975 (1.895)		.045 (1.365)
Rural		-2.894 (2.104)		-5.598* (2.442)		-4.037* (1.614)
Cost in-State		-.001*** (.000)		.000 (.000)		.000* (.000)
Cost out -of		.002***		.001***		.001***

-State		(.000)		(.000)		(.000)
Books and Supplies		-.001 (.001)		.001 (.001)		-.001 (.001)
Institutional Size		1.510* (.683)		1.744* (.726)		2.607*** (.534)
Constant	22.193*** (6.397)	23.285** (7.543)	53.097*** (7.229)	37.852*** (8.468)	48.380*** (5.078)	29.281*** (5.803)

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

Table 4.14: Z Scores						
	Black b	**Black-Hispanic Z-Score**	Hispanic b	**Hispanic-White/Asian Z-Score**	White/Asian b	Black-White/Asian z-score
Remedial	-7.442*** (1.410)	-1.303	-4.705** (1.558)	-1.644	-1.569 (1.101)	-1.418
SAT Verbal 75	0.078*** (0.023)	-0.317	0.089*** (0.026)	0.805	0.064*** (0.017)	-0.192
SAT Math 75	-0.007 (0.023)	-0.835	0.022 (0.026)	-1.360	0.065*** (0.018)	-0.508
Distance Learning	-2.820* (1.278)	1.033	-4.829*** (1.466)	-2.683**	-0.056 (1.008)	-3.287***
Study Abroad	-0.287 (1.430)	0.031	-0.355 (1.642)	-0.678	0.997 (1.132)	0.431
Weekend Classes	-2.809** (1.078)	1.109	-4.610*** (1.214)	0.103	-4.764*** (0.883)	-1.256
Per Capita Academic Support (log)	0.333 (0.379)	-1.064	0.963* (0.455)	0.527	0.693** (0.235)	-2.077**
ROTC	2.965* (1.212)	1.225	0.740 (1.353)	-0.310	1.262 (1.003)	0.359
Employment Services	-6.486* (2.626)	-2.661**	4.357 (3.115)	0.792	1.505 (1.809)	-2.096**
Placement Services	4.233* (1.863)	2.391**	-2.446 (2.082)	-0.922	-0.135 (1.398)	-0.014
Per Capita Student Services (log)	0.178 (0.541)	-0.733	0.813 (0.676)	0.623	0.342 (0.339)	-1.497
Percent Black Students	0.267*** (0.050)**	3.804***	-0.033 (0.061)	0.953	-0.101** (0.037)	2.392**
Percent Hispanic Students	0.197*** (0.065)	-1.182	0.309*** (0.069)	1.702	0.164*** (0.050)	-1.532
Percent White/Asian Students	0.197*** (0.046)	1.531	0.093 (0.050)	-0.371	0.115*** (0.032)	1.409
Percent Financial Aid	0.026 (0.066)	0.348	-0.008 (0.072)	-0.559	0.042 (0.053)	-0.228
Percent Pell Grant	-0.220*** (0.048)	0.705	-0.272*** (0.056)	1.669	-0.384*** (0.037)	1.004
Average Pell Grant	0.002 (0.001)	1.789	-0.002 (0.002)	-0.447	-0.001 (0.001)	0.707

Percent Institutional Grant Aid	-0.078* (0.033)	-1.585	0.003 (0.039)	-0.148	0.010 (0.027)	-2.575**
Average Institutional Grant Aid	0.001*** (0.000)	-----	0.000 (0.000)	------	0.001*** (0.000)	------
Percent Loan Aid	-0.004 (0.040)	2.775**	-0.167*** (0.043)	-2.716**	-0.023 (0.031)	1.052
Average Loan Aid	-0.001** (0.000)	-------	-0.001 (0.000)	--------	-0.001* (0.000)	---------
Log Per Capita Endowment	1.137*** (0.273)	0.030	1.125*** (0.294)	0.155	1.068*** (0.220)	1.280

Standard errors in parentheses
*p<.05, **p<.01, ***p<.001

APPENDIX 5

IRB APPROVAL FORM

University *of* New Hampshire

Research Integrity Services, Service Building
51 College Road, Durham, NH 03824-3585
Fax: 603-862-3564

17-Dec-2010

Bramlett, Stephanie
Sociology, Horton
9 Silver Street
Dover, NH 03820

IRB #: 4455
Study: Minority College Student Retention
Review Level: Expedited
Approval Expiration Date: 16-Dec-2011

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved your request for time extension for this study. Approval for this study expires on the date indicated above. At the end of the approval period you will be asked to submit a report with regard to the involvement of human subjects. If your study is still active, you may apply for extension of IRB approval through this office.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the document, *Responsibilities of Directors of Research Studies Involving Human Subjects.* This document is available at http://www.unh.edu/osr/compliance/irb.html or from me.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or Julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,

Julie F. Simpson
Director

cc: File
Ward, Sally

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