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# Inequitable Achievement:

# Different Admissions Criteria, Same Predictors of Degree Attainment?

A Dissertation submitted in partial satisfaction of the requirements for the degree

Doctor of Education

in

Educational Leadership

by

Cynthia M. Avery

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California State University, San Marcos

Professor Patricia Prado-Olmos

2007

The Dissertation of Cynthia M. Avery is approved, and it is acceptable in quality and form for publication on microfilm:

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Chair

University of California, San Diego

San Diego State University

California State University, San Marcos

2007

# DEDICATION

This work is dedicated to those students who overcome amazing odds to attain their goal of a higher education. I continue to be inspired by first-generation students and students from under-represented groups who embrace the opportunity to attain a college degree and surmount astounding obstacles in this pursuit. You are role models for those who come after you in this journey. Your resiliency is remarkable.

This dissertation is also dedicated to the memory of my late father, a first-generation student and the first doctor in our family, whose ability to succeed in the academic world required unwavering commitment and dedication.

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## PUBLICATIONS

Goldstein, D., Day, J. & Avery, C. M. (2004). In a Crisis, Do Students Really Know they Matter? *About Campus, 9*(1), 26-28.

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ABSTRACT OF THE DISSERTATION

Inequitable Achievement:
Different Admissions Criteria, Same Predictors of Degree Attainment?

by

Cynthia M. Avery

Doctor of Education in Educational Leadership

University of California, San Diego, 2007
San Diego State University, 2007
California State University, San Marcos 2007

Professor Joseph F. Johnson, Jr., Chair

San Diego State University (SDSU) admits freshman under two different admissions criteria. This study examined the intra-institutional gaps in 6-year degree attainment of students admitted under the two different admissions groups. The research focused on the graduation of White, Hispanic and African American[1]

[1] Note: The terms "White," "Hispanic," and "African American" are utilized by San Diego State University to identify students' ethnicity. These terms will be used throughout this document unless citing another's research.

students. Specifically, this study examined the predictors of degree attainment for the fall 2001 freshmen cohort. Theoretical models of retention guided this study.

The research design includes the use of both descriptive and inferential statistics to examine hypotheses regarding student achievement. Quantitative analysis focused on extant data. Cross-tabulations identified graduation outcomes and binary logistic regression models identified predictors of graduation. Among the most significant or recurring predictors in the models were math aptitude, high school grade point average, living on campus and participation in a one-unit freshman seminar course.

A strengths-based qualitative inquiry supplemented the quantitative analysis. Interviews of African American, Hispanic and White students admitted as freshmen in fall 2001 enhanced the study. The participants gained admission to SDSU under the university's minimum admissions criteria and participated in graduation in spring 2007. The interviews explored students' perceptions of both institutional and personal factors that supported their persistence to graduation. Common supports identified through the analysis of the qualitative data included parental support, social capital, and personal qualities of self-determination and resilience.

# CHAPTER 1

## Introduction

A disparity exists, not only in K-12 schools, but also in higher education regarding the educational success of students from minority groups compared to White students. Recent legislation called attention to this educational inequity in the K-12 sector and established accountability systems to reduce the disparities. It may therefore be reasonable to forecast the establishment of accountability measures to hold leaders of colleges and universities responsible for their results (U.S. Department of Education, 2006). Improving graduation rates results in significant positive outcomes for individuals, universities, and society. Individuals who complete college benefit both cognitively as well as economically. Colleges and universities realize improvements to their finances and their reputation as their graduation rates increase. Finally, society benefits from lower poverty and employment rates as well as a work force prepared to meet the demands of a global economy.

### *Statement of the Problem*

Almost half of U.S. college students fail to graduate, even though they satisfy their colleges' admission criteria. Many of these students drop out before their second year of college. A recent ACT (formerly American College Testing Program, Inc.) policy report, stated that the national retention rate from freshman year to sophomore year is 73.5% for all 4-year public colleges (Lotkowski, Robbins, & Noeth, 2004).

Presumably, institutions would not admit students who lack the knowledge and skills required to access and succeed in collegiate curricula. Brown (1996) contends that institutions owe all admitted students the right to the best education that the university has to offer. One might argue this includes students' graduation.

For Hispanic and African American students, the journey through college toward a degree, successful career and promising future, is more likely to resemble travel through a sieve than an educational pipeline. Somewhere along the line, the majority of students drop out. The average national graduation rate is 53%: 67% for White students, 47% for Latino students and 46% for African American students. Independent of the institution's characterization as a selective or open access university, predominantly White, Historically Black, or Hispanic Serving Institution, educational outcomes are stratified; White and Asian students tend to graduate at higher rates than Hispanic and African American students.

Across the United States, there are 772 4-year colleges where African American students comprise at least 5% of the institution's population. At 229 (29.6%) of these institutions, the graduation rate for African American students is less than 30%. In fact, African American students are more than four times more likely to begin their college careers at institutions where at least 70% of Black students fail to graduate, than they are to attend an institution where at least 70% of Black students succeed (Carey, 2004, 2005). These are staggering odds for African American students. The graduation rates for Hispanic students are disheartening as well, even at Hispanic Serving Institutions. A search of Hispanic graduation rates at

Hispanic Serving Institutions reveals 6-year graduation rates between 9.6 and 73.3% (Hispanic Student 6-Year Graduation Rates at HSIs, 2007).

The policies, programs, and practices of institutions seem to influence graduate rates because graduation rates vary tremendously across institutions. While White, African American and Hispanic students all demonstrate higher graduation rates with the increase in selectivity of the institution, gaps between the Whites and students from the other two groups are evident. For institutions rated in the Carnegie classification as very selective, graduation rates for Whites was 76.4%, Hispanics 71.2% and African Americans 60.3%. The largest gaps between Whites and African Americans (20.8%) and Whites and Hispanics (16.5%) were found among moderately selective institutions. Within this classification group the 6-year graduation rates were White 58.1%, Hispanic 41.6% and African American 37.3%. Minimally selective institutions demonstrate the smallest gap between graduation rates, and also the lowest 6-year graduation rates when compared to the other classifications. Within the minimally selective institutions, Whites had a 6-year graduation rate of 38.6% followed by African Americans 28.6% and Hispanics 25.7% (Horn, 2006).

Graduation rates are only one indicator of the gap in access to collegiate success. A second example of an intra-institutional gap occurs when students with comparable scores on standardized tests end up with very different class rankings. For example, with an SAT score of 1200-1299, White students are likely to have a four year class rank around the 55$^{th}$ percentile, while Black students with the same score end up with a class rank at approximately the 30$^{th}$ percentile (Bauman,

Bustillos, Bensimon, Brown II, & Bartee, 2005). The indicators of the achievement gap in higher education are limited to retention and graduation rates. The focus of the achievement gaps examined in this study are the 6-year graduation rates of White, African American and Hispanic students at a public, 4-year selective institution.

The failure to retain Hispanic and African American students will have more negative effects as demographics shift, both in California and throughout the United States. According to the National Center for Educational Statistics, enrollment in degree granting post-secondary institutions will increase by 15 percent between 2000 and 2012 (Gerald & Hussar, 2002). Enrollment in public, 4-year institutions is expected to increase by 19% during the same period. In addition, the demographics reflect an increasing shift in ethnic representation. In a December, 2003 report, the Western Interstate Commission for Higher Education (WICHE) acknowledged a dramatic shift in the ethnic population in the country, and the State of California. In 2001-2002, 56.4% of the high school graduates in the state of California were non-White. In 2013-14, however, minority students will comprise 67% of the high school graduates (Blanco, 2003). As this demographic swing occurs, public institutions within the state must ensure their preparedness for the changing student population and be ready to demonstrate equitable degree attainment.

For African American and Hispanic students, access to graduation is limited further when students and parents have little information about variations in retention or graduation rates. Approximately 75% of the American adult population does not possess a bachelor's degree, thus they know little about the operation of the

institution, and have not questioned much of what occurs within the boundaries of these campuses (Scarlett, 2004). In fact, using U.S. Census data, Bauman and Gaff (2003) found the educational attainment of the U.S. Population 25 years and over as follows. A bachelor's degree or higher was attained by 26.1% of Whites, 14.3% of African Americans and 10.4% of Hispanics. This may be a significant reason why the majority of students and their parents are not prepared to ask critical questions before selecting a particular institution. To guide them in their college selection, prospective students and their parents often examine multi-college guides, university publications, and other information highlighting the outstanding offerings of institutions. Bensimon (2004) stated that while institutions regularly examine and publish information related to the incoming class of students, i.e. the average score on the SAT, they rarely report information regarding the characteristics of their graduates. As long as institutions fail to make their graduation rates known publicly (particularly data disaggregated by ethnicity), campus leaders will be able to mask the success (or lack thereof) of their university in graduating the students they admit.

Furthermore, while equity is stated as a standard of most accrediting organizations, none require institutions to report statistics related to student ethnic diversity beyond numbers admitted or enrolled (Bensimon, 2004). Although higher education is currently exempt from many of the accountability mandates faced by K-12 educators, the press for increased transparency in higher education is growing (Spellings, 2006). As demonstrated through the No Child Left Behind Act of 2001, disaggregated accountability data provide important feedback for educational leaders. Negative feedback often creates the sense of public crisis necessary for

action (Birnbaum, 1987). The bottom line for leaders in higher education, however may be that it is not ethical or socially responsible to accept students unless the institution commits to helping them graduate (Ladner, 1966).

Public institutions serve a distinct purpose within our society. According to the American Association of State Colleges and Universities (AASCU) (2006), which represents 400 public universities across the country, members of this body:

> …work to extend higher education to all citizens. Access is a hallmark of AASCU institutions, colleges and universities that embrace students who traditionally have been underrepresented in higher education as well as those who are first-generation college students. By *Delivering America's Promise*, these institutions fulfill the expectations of a public university by working for the public good through education and engagement, thereby improving the lives of people in their community, their region and their state (para. 1).

A struggle is imminent, however between public purpose and prestige. Public institutions face a tug of war of sorts. External challenges by public officials to maintain the original purpose of these institutions square off against internal challenges from administrators and faculty striving for prestigious rankings among their peer institutions (Burke, 2006). This push for prestige may include increasing admissions criteria to control enrollment as the number of students interested in the institution, based on its reputation, increases. As this occurs, smaller percentages of applicants gain access to these public institutions. Therefore, universities would benefit if they could better identify predictors of student success.

### *Purpose of the Study*

The purpose of this study is to describe and examine the intra-institutional gaps in 6-year degree attainment at San Diego State University based on both the

eligibility indices for admission to the university and ethnicity. San Diego State University is a large, public university. The 6-year graduation period is the standard denominator; acknowledging the college-going patterns of today's college students, many of whom attend the university part-time (Kuh, Kinzie, Schuh, Whitt, & Associates, 2005). The study will examine the graduation rates of White, Hispanic and African American students from one cohort of students admitted to the university as first time freshmen in fall 2001, through their 6-year graduation mark, in spring 2007. Specifically the two major components of this study, quantitative and qualitative, will examine how entry-level characteristics, academic preparation, institutional programs and support systems affect graduation rates.

The university admits students in two categories. Eighty percent of each incoming freshmen class attains admission by meeting the SDSU eligibility criteria. The eligibility index, the score used to determine admission decisions, is a calculation of the student's high school GPA and their score on the SAT or the ACT. The formula for the eligibility index is either (high school GPA X 800) + (SAT Score) or (high school GPA X 200) + (10 X ACT Composite Score). This formula is common throughout the California State University System. For fall 2001, this eligibility index was 3,525. The remaining 20% of the freshmen spaces are reserved for students who meet the minimum California State University admissions criteria (2,900, based upon the same eligibility index formula) but do not meet the SDSU criteria. This study will determine if there are different predictors for White, Hispanic and African American student degree attainment if admitted under the two

different admissions cohorts (those who meet the lower eligibility index of 2,900-3,424 and those admitted who met the high eligibility index; greater than 3,424).

Several reports describe the positive correlation between high school GPA and/or SAT with freshman GPA and student retention or continuation rates. (Cambiano, Denny, & De Vore, 2000; Daugherty & Lane, 1999; DeBerard, Spielmans, & Julka, 2004; Geiser & Studley, 2004; Wolfe & Johnson, 1995). Other studies found that student attrition is related to multiple variables, including the institution's environment and support of students (Carey, 2004, 2005; Woodward, Mallory, & De Luca, 2001). San Diego State University, like many institutions, struggles to identify the causes of attrition and the factors contributing to student retention and persistence to degree.

The draft of the San Diego State University 2006 Report of the Graduation and Retention Subcommittee of the Undergraduate Council described this tension. An apprehensive conversation between the two camps reveals one belief that an increase in eligibility index scores will lead to higher retention and graduation rates, while others hold the position that these scores reflect minimally on the host of variables that impact student retention (San Diego State University, 2006). This report does not address, however, the institution's commitment to the 20% of each incoming freshman class that meets the lower, CSU eligibility index. This fifth of the freshman class has demonstrated a lower level of college preparedness (as measured by high school grade point average and scores on the standardized achievement test). It is also important to note that 31.5% of the Hispanic and 46% of the African

American students in the entering class fall into the lower eligibility index cohort, compared to 14% of the White students.

If academic preparation is the greatest predictor of higher retention and collegiate success rates, then intra-institutional achievement gaps within eligibility index stratifications would be unlikely. Said in another way, students in the lower eligibility index admissions cohort should have similar graduation rates regardless of ethnicity, as should students in the higher eligibility index admissions cohort. Typically, identification of an achievement gap prompts research to explore the causes of the gap, or the barriers to student success. New approaches in psychology applied to a variety of fields including business and education suggest that identification of the factors that enable student success is equally important (Cameron, Dutton & Quinn, 2003).

This research strives to add to the existing literature by taking a strengths-based approach to examining the factors predicting graduation for the two distinct admissions criteria (low eligibility index and high eligibility index), disaggregated by ethnicity. Taking a strengths-based approach shows promise in recent research. Identifying individual and systemic deficits can result in a decrease in efficacy (Srivastva & Cooperrider, 1998). In contrast, focusing on positive organizational scholarship is the study and application of human resource strengths and psychological capacities (Luthans, 2003). According to Luthans (2003), these are "psychological capacities that can be measured, developed, and effectively managed for performance improvement in today's systems" (p.179). The current achievement

gap exhibited in college and university systems warrants such improvement and the strengths-based approach offers a lens as well as an orientation to examine this issue.

To address this purpose this study will explore the following research questions regarding SDSU's freshmen class of 2001 through quantitative analysis of extant data.

1.) What are the 6-year graduation rates (disaggregated by ethnicity) of students who entered the university with similar academic preparation (measured by their admissions eligibility index)?

2.) What are the predictors of graduation for students admitted under the two different admissions criteria?

3.) Are variables associated with academic preparation (high school GPA, SAT test scores, AP credit, etc.) the most predictive variables of graduation for all three ethnic groups (White, Hispanic, African American) within the two different eligibility requirements for admission?

4.) Are the predictors of graduation the same for African-American, Hispanic and White students admitted for each of the two different admissions criteria?

5.) Which group of factors, (demographic, high school preparation, or college related) accounts for the greatest variation in graduation rates?

Through individual interviews of students who participated in the spring 2007 graduation ceremony, this study further explored the research question:

6.) How do graduates who entered the university in the fall 2001 semester with lower eligibility indices, describe their personal, as well as the university's supports in aid of their graduation?

*Significance of the Study*

The California State University (CSU) system has a policy of admitting students who meet a minimum qualification level. The system has often been referred to as the "people's university" because of ease of access. The CSU is the largest and most diverse higher education system in the United States and serves students through regional institutions across the state (The California State University, 2006). Acknowledging and understanding achievement gaps necessarily precedes addressing and closing gaps in degree attainment. As the demographics of California change, the public university systems will reflect the growth in the minority populations, particularly the Hispanic population. Often these diverse students are from low socioeconomic backgrounds and incur significant debt for the opportunity to attend a college or university. Although those who attend college and do not graduate have a higher earning potential than those who have never attended college, there are significant personal, economic, and social implications of attrition.

Leaders within the field of higher education are ethically responsible for providing all students admitted to their institution with the best possible education the college or university has to offer. By determining and understanding the factors that predict graduation for students from both admissions groups, particularly those

from the lower eligibility index, system administrators can make well-informed decisions to support and improve rate of degree attainment. This work will add to the existing body of literature by combining both a quantitative analysis and qualitative inquiry exploring from a strengths-based approach how "high risk" college students persist to graduation. Closing the gap in degree attainment is essential for both moral and practical reasons.

### *Moral and Practical Imperatives to Close the Gap*

Campus leaders direct the mission, vision, values, organizational structure and resources of the institution. The leaders' understanding of the graduation rates may stimulate organizational conversations and change, resulting in more equitable graduation rates. As student populations on college campuses continue to change, more accurately representing the rich diversity of our country, there are both moral and practical reasons leaders in higher education must pay attention to retention and graduation rates. These imperatives include individual, institutional and societal benefits to close the gap.

#### *Individual Benefits*

Gaps in lifetime earning potential between high school graduates, those with some college but no degree, and those who have a college degree are significant. The difference in 2003 median annual income for people age 25-64 years of age between high school graduates and college graduates was nearly $17,000. The difference between individuals with some college but no degree, and individuals having earned a bachelor's degree is in excess of $12,000 (Postsecondary Education OPPORTUNITY, 2005). Viewed from another angle, the statistics related to

lifetime earnings are even more alarming. The difference between lifetime earnings for an individual with some college completion ($1,500,000) and a bachelor's degree ($2,100,000) is $600,000 (Postsecondary Education OPPORTUNITY, 2002).

The number of low-income students enrolled in higher education is increasing (Mortenson, 2003). The early departure, pre-graduation of students from low-socioeconomic backgrounds creates additional concerns. The burden of repaying student loans compounded with lower earning potential compared to those who graduate, results in increased debt-to-income ratios. The loans these students procured in an attempt to get ahead may actually worsen their financial situation if they do not attain a degree. Important to this conversation is the fact that Blacks (27.7%) and Hispanics (21. 9%) are more than twice as likely as Whites (10.8%) to be living in poverty (US Census Bureau, 2004).

Individual benefits also include increased cognitive skills and the development of subject matter competence as well as verbal and quantitative skills. Additionally, positive psychosocial changes including identity and development as well as changes in attitudes and values (i.e. cultural, aesthetic) can result. Other factors include improved quality of life after college. Increases in graduation rates, therefore, have the potential for significant, positive impacts on future generations of minority families (Gohn & Albin, 2006).

*University Benefits*

Moving from the micro toward the macro level, colleges and universities also benefit by closing the achievement gap. The institution's retention rate of students affects university funding as well as the ability to plan for curricula and the development of campus facilities. The need to improve retention and graduation rates weighs heavily on university presidents, system administrators, faculty and staff alike. In fact, David S. Spence, former executive vice chancellor and chief academic officer for the California State University (CSU), stated, "Improving the rate at which students graduate from the CSU will fulfill the commitment of time and money on the part of students and California taxpayers" (The California State University, 2005a). Failure to retain and graduate students is detrimental to the bottom line of the university, as well as its reputation.

Another benefit to universities in reducing student attrition, are the financial costs associated with student recruitment and lost tuition. Approximately 65-75% of the total operating budget of private universities comes from tuition (Glennen et al., 1996). Although a much smaller percentage of the operating budget of public colleges and universities comes from tuition, it is important to consider other costs of student attrition. Institutions also depend on student-generated revenue derived from on-campus residency and dollars spent by students and their parents at the campus bookstore, dining facilities, convenience stores and sporting events. In tough economic times, college and university leaders must improve campus retention for both the interest of the students, future generations, and the institution's cost-containment. While a satisfied student-customer will share his or her positive

experience with others, an unhappy student-customer will tell twenty-five people not to go to their former school (Dennis, 1998). It is both ethical and fiscally responsible to pay more attention to the retention of college students (Dennis, 1998).

*Societal Benefits*

Finally, a variety of societal benefits to achievement gap reduction and elimination are noted. Closing the achievement gap in higher education would provide significant gains for our country's educational level as a whole. Carey (2005) indicates that if our nation succeeds in cutting the achievement gap between Whites and Blacks in half, the number of African American college graduates would increase by 10,000 each year. To meet this goal, graduation rates for African American students would need to increase by 9.5 percentage points. By eliminating the gap 200,000 African Americans over the next ten years would be better able to compete for higher paying jobs, higher standards of living and greater opportunities.

As the global economy expands, the United States falls further behind other industrialized nations in many measures of economic success, including education (Programme for International Student Assessment, 2004; Wagner, 2006). It is imperative for the United States' educational entities, including higher education, to concentrate on organizational practices that will lead to the greatest student retention rates and ultimately student persistence to degree. In particular, college and university leaders must strive to ensure student graduation rates are equitable across ethnic groups.

The societal imperatives to close the gap include the responsibility to provide equitable educational opportunities to the next generation of America's leaders. In

addition, leaders in higher education must ensure educational equity for all students admitted to colleges and universities. Educational leaders must balance a delta: who they are, to whom they are responsible, and to whom they are accountable. These three critical components must underpin the work undertaken by higher education administrators. Ladner and Ghadegsin (1996) urge educational leaders to be concerned with the education of the next generation of leaders as well as to remember that our current students did not create the challenges of today's world, one that is infinitely more complex than any previous generation has known.

In addition, Gohn & Albin (2006) also note multiple societal benefits of a citizenry where more individuals attain college degrees. These societal benefits include lower poverty levels and lower levels of unemployment as the individual's knowledge and ability more closely parallels the needs of employers. Related to this is a decrease of dependency on social programs, ultimately decreasing the demands of public budgets for these programs. Further, a relationship exists between increased education, decrease in smoking rates and more positive perceptions of health. Finally, other social benefits noted by Gohn & Albin (2006) include lower incarceration rates and increased levels of civic responsibility and volunteerism.

The moral and ethical reasons to close the achievement gap are compelling, and the work in identifying predictors to graduation has just begun. In order to attain the individual, university and societal benefits associated with closing the gap, it is important to continue this work. Investigation of how students deemed "at risk" persist to graduation provides an opportunity to examine graduation from a strengths-based approach. Universities must evaluate their admissions policies to

determine whether their formulas for admission are indicative of student potential, and persistence to degree. Furthermore, the university must ensure that admissions policies do not inadvertently work against students for whom standardized tests are not an accurate indicator of acumen and potential. We must also continue to explore the unique demographics, bureaucracies and guiding principles of our campuses to gain a better understanding of institutional supports as well as obstacles. Finally, we must provide to all students, programs and services known to enhance student degree attainment.

# CHAPTER 2

## Review of the Literature

Several studies have examined higher education dropout issues and factors contributing to attrition. Some of these studies can best be explored in a historical context, reviewing the development of the major attrition and retention theories and models. The first section of this literature review discusses the research underlying these theories and models. In contrast, the second section describes studies that are important because they explore specific factors related to student retention or graduation prediction.

### *Development of Retention Theories and Models:*

The literature related to student retention and graduation draws on several theoretical models. Retention theory represents a variety of perspectives, including psychological and sociological models and more recent organizational approaches. Research in this area first focused on dropouts and relied on psychological suicide models. The models grew into larger sociologic models. Recent research, combined with continued high attrition rates, indicate that retention of students is a complex and evolving issue worthy of ongoing examination. Relatively new related studies shift the focus from factors that contribute to student retention or drop out to exploration of the variables contributing to student degree attainment. There is a dearth of research in this area.

Spady (1970, 1971) developed the first model addressing college student's dropout behavior. His early theory utilized a sociological lens to examine the interaction between the characteristics of the student and the campus environment. This model was a derivative of Durkheim's (1951) earlier work on suicide. Spady's model posits that five independent variables (academic potential, normative congruence, grade performance, intellectual development and support of a peer group) are linked to the student's decision to leave the institution (dependent variable). The relationship between the independent and dependent variables is influenced by two intervening variables, student satisfaction and the commitment of the institution. After completing an empirical study of his model in 1971, Spady concluded students' decisions to leave the university were based primarily on academic performance. This held true for both male and female students. Spady's research was soon followed by Tinto who highlighted the importance of students' social and academic integration in their decisions to stay or leave the institution.

Tinto's interactionalist theory of student departure served as a keystone to research in this area over the past several decades (Tinto, 1975, 1987, 1993, 1999). Also stemming from the work of Durkheim (1951), Tinto's original theory of student attrition held that student success determined students' degree of commitment to their future career, academic achievement and their institution. Tinto's (1987) model incorporated the rites of passage included in earlier work by Van Gennep (1960). Van Gennep described three stages through which youth pass on their way to becoming full participants in society. These stages included separation, transition

and incorporation. Tinto related these stages to the transitions students make from their home environment to the institution.

Neither Spady (1970, 1971) nor Tinto (1975) defined which aspects of social and academic integration were most likely to support student graduation. They also did not explore how social and academic integration affect retention of diverse students.

In an attempt to extend upon the earlier work of Spady (1970, 1971) and Tinto (1975), Pascarella and Terenzini (1979) conducted a longitudinal study at a large, residential university in New York. Specifically, their study examined the interactive influence of measures of social and academic integration on the students' decision either to remain at the institution or depart. Their sample included 1,457 students. In addition to confirming the results of earlier work on retention theory they found that the first year of college is critical and perhaps more important than other factors including students' background characteristics, aspirations and attitudes.

Tinto (1993) continued his work adding a longitudinal explanatory model of departure. This newer model added other factors that contribute to student departure. Additional factors explored in this model include student adjustment, incongruence, isolation, difficulty, finances, learning and commitments outside of the educational environment. In sum, the model concluded that the stronger a student's academic and social integration with the formal and informal educational environments and social systems of the institution, the more likely they were to be committed to degree attainment. Tinto (1993) recognized in his later model that specific student

populations (i.e. non-traditional students, honors students, students identified as at risk, etc.), as well as different types of institutions (i.e. commuter, community colleges, urban, large public, etc.) require different types of retention programs and policies to ensure student success.

Tinto's (1993) theory of student departure is one of the most studied in the field of higher education (Baird, 2000). Braxton (2000) reviewed over one hundred different tests of this theory. These tests included single institutions, multiple institutions, and tests by type of institution. Braxton (2000) concluded that while the multi-institutional tests were more robust, both multi-institutional and single-institutional tests of Tinto's student departure model provide empirical evidence of the influence of student academic integration on subsequent institutional commitment and student departure.

Several researchers, however, have expressed concern regarding the validity of Tinto's model when applied to the college experiences of non-White students (Guiffrida, 2005; Hurtado, 1997; Tierney, 1999). Specifically, Tinto's 1987 work explained that students leave college because they fail to separate from a previous socializing factor; they do not effectively negotiate their transition to college and do not incorporate new values into their collegiate experience. Tierney (1992, 1999) argued that this fails to recognize the importance of the family support structure in the lives of minority students.

In developing a different model of student departure, Bean (1983) derived his theory from the area of worker turnover. This psychological process model asserts that consideration of student background characteristics is paramount to an

understanding of students' interactions within an institution's environment. Students' perceptions of organizational attributes and reward structures affect student satisfaction and ultimately retention. This included students' perceptions of both subjective (the value of education, the quality of the institution) and objective measures (GPA, whether or not they belong to student organizations). A weakness of Bean's (1983) study, however, was that the sample consisted of only women at one land-grant university. While the theory of worker turnover demonstrated some applicability, it was not enough to explain student attrition because it failed to address demographic, cultural and academic preparation factors that contribute to student success (or departure).

Astin's (1977, 1985) theory of student involvement postulated that the greater the level of student involvement in the university, the more likely students were to be retained. Student involvement is the amount of physical and psychological energy devoted to the academic environment. The focus of Astin's (1984) developmental theory of student involvement was the identification of variables within the university's environment that affected student retention. Astin (1984) postulated that the greater the student's involvement, the greater the learning and personal development. Astin does not explain, however, how the involvement has an affect on student retention and persistence to degree. It describes growth and learning, but not the sociological effects of the involvement.

Whitt & Handal (1984) also explored the campus environment and how the student fit within this environment. Person-environment theory posits that the

greater the congruence between the person and the social environment, the greater the level of satisfaction. Increased levels of satisfaction elevate the degree to which students should be able to attain their educational goals. This study found however, that the environment had a stronger relationship to student satisfaction than person-environment congruency.

Bean's later work (1985) resulted in a revised conceptual model. Bean (1985) conducted an empirical test of this model at a single university (n = 1,406). This study resulted in three specific findings. First, peers were found to be more important in student socialization than informal faculty contact. Second, students may play a more active role in their socialization at the institution than was previously posited. Finally, students' grades were more likely to result from selection than socialization (p. 35).

A general causal model of student retention was developed by Pascarella (1985). This model included student characteristics and institutional characteristics interacting with the college environment. Pascarella's empirical study of this model found that residential facilities and students' peer groups greatly influenced students' academic achievement. Unlike Astin's (1993b) research that found direct faculty/student involvement unlikely to influence student growth and development; Pascarella found that students' interaction with faculty members outside of the classroom positively affected student achievement.

Astin (1993b) conducted an extensive longitudinal study using data from more than 200 colleges and universities and over 25,000 students. This model detected three forms of student involvement critical to their retention (Astin, 1993a). These variables included students' academic involvement, their involvement directly with faculty and most importantly interaction with the student's peer group. In fact, the peer group was the factor most likely to influence undergraduates' growth and development. Specifically noted were the positive effects of student-student interaction on leadership and academic development as well as problem solving and critical thinking skills, and cultural awareness.

The student retention model developed by Bean and Eaton (2001-2002) was grounded in the psychological processes central to student academic and social integration. This model called for institutions to develop and offer a variety of programs to integrate students socially and academically into the collegiate environment, thus promoting student success. This model stemmed from four specific psychological theories including self-efficacy theory, attitude-behavior theory, coping behavioral theory, and attribution theory. Self-efficacy theory, or how confident the student is that he/she can succeed academically, was found most important. Collectively these theories state that the degree to which a student is able to transition to the college environment, handle various situations and exhibit an internal locus of control significantly influences their ability to continue at the institution (Bean & Eaton 2001-2002). These theories prompted recommendations that colleges offer programs such as learning communities and freshman specific

programs (i.e. orientation, interest groups, mentoring programs, etc.) to promote student psychological growth in the areas mentioned, which would in turn result in greater academic and social integration, satisfaction and retention.

Kuh and associates (2005) examined conditions at universities that contribute to student success, primarily in terms of engagement. Engagement, the manner in which students are involved in the university experience, was found more important to the retention puzzle than school location, or student demographics. Kuh (2001-2002) proposed that campuses not introduce new policies or programs to "fix" retention. These things will not alone change either a campus' culture or student's perceptions of institutional support. Rather, Kuh suggested that change occurs over time through the development and implementation of overlapping and interconnected initiatives that can influence institutional culture supportive of student success (Kuh, 2001-2002).

*Specific Variables and their Affect on Retention and Persistence to Degree*

Research has demonstrated that numerous variables are correlated with student retention. Quantitative studies have focused upon variables that can be grouped into three categories, demographic data, high school preparation and campus related variables. The demographic variables include gender, ethnicity, socioeconomic status and parental educational achievement. Both socioeconomic status (Adelman, 2006; Astin 1993b; Pascarella & Terenzini, 1991; Tinto, 1987, 1993; Walpole, 1997, 2003) and parental education level (Pascarella, Pierson, Woniak & Terenzini, 2004) have an affect on student retention and persistence.

Additionally, universities collect data related to students' academic preparation as demonstrated by high school grade point average, scores on standardized tests such as the SAT and ACT and college credit attained through advanced placement courses. These factors are also related to the retention of students (Adelman, 2004; Cambiano et al., 2000; Pascarella & Terenzini, 1991; Stumpf & Stanley 2002).

Finally, universities also track college specific factors such as whether or not students lived on campus, took a first year seminar course or participated in an Educational Opportunity Program. Again, these factors have demonstrated an effect on retention, specifically first year residence (Astin 1975, 1977, 1993b; Chickering, 1974; Pascarella & Terenzini, 1991) and first year programs (Tinto, 1987, 1999).

One area that universities have a difficult time tracking is student engagement. Students can become engaged on campus in multiple ways. For example, the institution rarely records all the members of a student organization. Similarly, colleges and universities infrequently have methods to record student interactions with faculty members (both formal and informal) within institutional databases. While level of student involvement in the co-curricular experience is difficult to measure, research in this area is pointing to the potential predictive power of measures of engagement on student success (Astin 1993b; Berger & Milem 1999; Hoffman 2002, Horn 1998, Tinto 1982, 1987, 1998).

This following section of the literature review is divided into these four primary categories. Studies that specifically relate to characteristics or variables within each category are explored.

*Demographic variables*

*Gender and Race/Ethnicity*

It is hard to dismiss the fact that students of different ethnicities graduate at different rates, and that women tend to outperform males. The California State University System (2005) reported the six year graduation rates for Whites, Hispanics and African Americans who started as first-time, full-time freshmen in Fall 2000 as 53.7%, 42%, 31.8% respectively. These graduation rates are lower than the national graduation rates for White, Hispanic and African American students, reported at 59.5%, 47%, and 40.5% respectively (The Education Trust, n.d.).

More women are attending college then men. Women are also graduating at higher rates than men. Within the California State University System, six-year graduation rates for males and females who entered as first-time and full-time freshmen in fall 2000 were 42.6% and 51.7% respectively (The California State University, 2005b). Goldin, Katz and Kuziemko (2006) identified several reasons more women enroll in college, including the fact that women outperform men with regards to college preparatory curriculum, high school grades and test scores. Clearly, there is a gap in degree attainment based on ethnicity and gender.

Adelman (2006), however, determined that gender and race were not predictors of college graduation. Adelman (2006) followed a national sample of eighth-graders scheduled to graduate high school in 1982 through 1993. Adelman evaluated several student demographic factors treating each as an independent variable; only one was significantly associated with degree completion. Socioeconomic status was significantly, although moderately associated with degree

completion (Adelman, 2006). While White upper and middle class students accomplish similar educational attainment regardless of gender, students from lower socioeconomic backgrounds do not perform as well. Low socioeconomic status tends to pronounce the results in educational attainment between males and females, for White, Hispanic and African American students (King, 2000).

*Socioeconomic status*

Choy (1999) found that less than half (49%) of high school graduates from low-income families attended an institution of higher education (either two- or four-year college) immediately after high school, compared to almost two-thirds (63%) of their middle-income peers and more than three-fourths (78%) of their high-income peers. Similarly, Cabrera, Burkum and La Nasa (2003) followed a high school sophomore cohort and identified nine pathways to a four-year college degree, dependent upon the level of academic preparation in high school and the first type of postsecondary institution attend (either 2-year or 4-year). Students from low socioeconomic backgrounds were most likely to have moderate (53%) or low (22%) academic resources in high school. In contrast, high SES peers were more likely to receive high (59.4%) or moderate (33.3%) academic resources in high school. An examination of degree attainment of this cohort further illustrates the differences based on socioeconomic status. Cabrera, Burkum and La Nasa (3003) found a 44% gap in completion of degree between the low SES and high SES students.

An important finding of Astin's (1993b) study also relates to students' socioeconomic status (SES). Astin found students' SES has its strongest effect on completion of the bachelor's degree. This SES effect was more significant than all

measures of ability and other student input characteristics. Astin postulates that a relationship also exists between undergraduate students' satisfaction with their student experience and SES. Astin (1993b) concluded that students from higher SES backgrounds were more likely to have positive outcomes in college, regardless of their academic preparation, abilities or other demographic characteristics.

A family's socioeconomic status often correlates with parental education level. Individuals with experiences in higher education tend to earn more than those who did not go to college regardless of whether or not they graduated (Postsecondary Education OPPORTUNITY, 2002, 2005). Research indicates that students from low socioeconomic backgrounds have lower educational aspirations and are less likely to persist in education, both prior to and during college (Astin, 1993; Pascarella & Terenzini, 1991; Tinto, 1987, 1993). Some argue that those from lower income families may be in a worse financial situation if they attend college because they are less likely to graduate, and will be burdened to pay student loan debt (Gladieux & Swail, 1998). Cultural capital and social capital are important concepts in the discussion of socioeconomic status.

Walpole (2003), defined cultural capital as a type of knowledge not taught in schools, rather it is specialized or insider knowledge. In contrast, social capital is about the networks an individual has, their contacts and professional memberships that have the potential to be used for professional gain (Walpole, 2003). Walpole (1997) highlights the relationship between socioeconomic status and student success by claiming that educators value high-status cultural capital, thereby essentially leaving lower SES students at risk for lower educational success. Walpole (1997)

examined longitudinal data from a national study of college students, specifically those attending four-year institutions. This national survey of students is part of the Cooperative Institutional Research Program sponsored by the Higher Education Research Institute. Specifically, this study examined a baseline survey in 1985 and included two follow-up surveys in 1989 and 1994. Walpole's inquiry specifically focused on the similarities between collegiate behaviors of students in the lowest and highest quintiles of SES.

Analysis in Walpole's (2003) study included cross-tabulations of student activities with low/high SES and multivariate analysis. Walpole found that low SES students spend less time than their peers in student organizations. This finding is of concern due to the established importance of student involvement in student development and persistence (Astin, 1984, 1993b; Pascarella & Terenzini, 1991; Tinto, 1987, 1993). Lack of involvement with peers also relates to a lower level of acquired cultural and social capital. Walpole (1997) found however, that the low SES students were gaining more economic capital while simultaneously working and taking classes. In the nine-year follow up, low SES students reported lower levels of educational attainment and income and were less likely to attend graduate school (Walpole, 1997). This study did not report bachelor's degree completion.

*Parental education level*

Parental education level affects student retention and graduation. According to the National Survey of Student Engagement (2005), approximately one-third of college students come from homes where neither parent had any experience in higher education. Pascarella, Pierson, Wolniak & Terenzini (2004) found that first-

generation college students (defined as students from families where neither parent had more than a high school education, p.250), are at a greater risk of being left behind their peers academically, socially and economically. This three-year longitudinal study from 1992-1995, compared students from 18, 4-year institutions. All of the students in the study participated in the National Study of Student Learning. This federally funded survey examines college students' experiences and outcomes. Comparison groups were students whose parents have graduated college and those who have not, academic motivation being similar. First-generation college students tended to know less about the application process and financial costs associated with higher education.

Pascarella et al. (2004) found that first-generation college students tend to have lower family income and support, were more unsure of their educational degree expectations and had less academic preparation in high school. In addition, this study found that first-generation students demonstrated lower levels of extra-curricular involvement, athletic participation and other forms of student engagement than their peers. Similarly, Pike and Kuh (2005), found that first-generation college students' lack of understanding about the importance of getting involved and knowledge of how to get involved may be the primary factors in their low level of engagement. Despite these challenges, Pascarella et al. (2004) concluded that first-generation college students benefit more from their collegiate experiences than their peers because their gain in cultural capital is incrementally greater. While this study included a large sample size, and was longitudinal, it was limited in that it focused

on second- and third- year college students, and did not focus on first-generation students' persistence to degree.

*High School Related Variables*

High school related variables describe students' preparation for college as measured by the outcomes on several different variables. High school grade point average, score on standardized tests (SAT/ACT) and rigor of high school curriculum have all been associated with collegiate academic success.

*High School Grade Point Average and Score on Standardized Tests*

Multiple studies confirm the positive correlation between student academic preparation (measured by high school GPA, SAT and ACT scores) and increased continuation rates (Cambiano et al., 2000; Daugherty & Lane, 1999; DeBerard et al., 2004; Wolfe & Johnson, 1995). Studies report conflicting results regarding the predictive value of high school grade point average and standardized test scores. While Astin, Tsui, & Avalos (1996) found students with higher test scores and high school GPAs are more likely to graduate, others found that only high school GPA was found to be statistically significant as a predictor of graduation (Hoffman, 2002).

A large scale study by Stumpf & Stanley (2002), examined the predictive value of high school grade point average and score on both standardized achievement tests (SAT and ACT) at 350 four-year colleges or universities within the United States. The researchers used a simultaneous multiple regression model to predict the percentage of those graduating from the percentage of freshman with minimum high school grade point averages of 3.0 and SAT I Verbal and Math and ACT scores at the $25^{th}$ and $75^{th}$ percentile.

Stumpf and Stanley (2002) found that the predictive validity of GPA in combination with SAT and ACT scores is quite high. The regression analysis yielded a multiple correlation of .72. This finding is significant when compared to the predictive validity of GPA, SAT and ACT individually, as noted in previous studies (Astin et al., 1996). Interestingly, the beta coefficients showed that the Math SAT and the ACT scores at the 25$^{th}$ percentile made the largest contributions to the prediction of the percentage of freshmen graduating within six years. Few institutions require students to submit scores from both standardized achievement tests. To enhance their study, Stumpf & Stanley (2002) conducted two hierarchical regression analyses one entering the SAT scores followed by the GPA, and the second entering the ACT score followed by the GPA. Both analyses had similar results. Stumpf & Stanley (2002) suggest that persistence to graduation is more accurately predicted as a characteristic of the group or population studied than persistence on the individual level within a college. They recommend that institutions desiring definitive information about the variables predictive of graduation should correlate promising predictors for graduation versus non-graduation of its students. While this study added to the significance of using standardized predictors for graduation, it does not address predictive value of GPA and scores on standardized tests across ethnicities.

The differences in the predictive value of academic preparation, specifically high school grade point average and scores on standardized achievement tests between White students and underrepresented students are significant. These factors have been weaker achievement predictors for several minority groups than for

Whites. Moffat (1993) found that SAT score was not a valid predictor of achievement for Black students or White students over age 30. In a later study, Nettles, Millet & Ready (2003) found that controlling for socioeconomic differences between Black and White students significantly decreased (but did not eliminate) the gap in the ability of the SAT to predict student success. Fleming & Garcia's (1998) study of students admitted based on scores on standardized tests, conducted at eight predominantly White institutions, found only a slight difference (1.8%) in the variance of grades of White and Black students.

Hoffman and Lowitzki (2005), examined the predictive value of non-majority students' high school grades and scores on standardized tests on student graduation at a predominantly White, Lutheran university. Although a much smaller study (n= 522), conducted at a religious institution, the results were interesting. Through testing and revision of an a priori path analysis model, they found that for students who were non-White, or non-Lutheran, high school grades were a greater predictor of academic achievement than scores on standardized tests. The ability to generalize the findings, however, is limited due to the campus' status as a private institution and the small sample size.

*Rigorous High School Curriculum*

Others argue that neither the standardized test scores, nor the high school grade point averages are accurate indicators of future success. A comprehensive and longitudinal study, conducted by the National Center for Educational Statistics, using a logistic regression purports that the intensity of the high school curriculum is the most predictive factor of college completion (Adelman, 2006). Unlike many other

studies, this study followed high school graduates from the class of 1992 over a span of 8.5 years, and from university to university. The sample included 12,000 students, representing a weighted 2.9 million students. Adelman (2006) found that completion of demanding math coursework including algebra II, precalculus, trigonometry, etc. is the single best high school predictor of college success. Contributing to the achievement gap, therefore, is the fact that Hispanic and African American students, as well as students with low SES are significantly less likely to attend high schools that offer the same educational opportunities, including rigorous curriculum as their White and high SES peers (Adelman, 2006; Orr, 2003).

*College factors*

Many factors associated with student success follow student arrival to the campus. When considering student persistence, Pascarella & Terenzini (1983) found that that students high school GPA and standardized test scores did not have a direct influence on persistence. Students' experiences on the campus however, were more important in predicting persistence. Campus related factors associated with student retention, success and persistence to degree include living on campus, participation in a freshman or university seminar course, participation in the Educational Opportunity Program, and the student's level of engagement in the campus.

*Campus Resident v. Commuter Student*

Place of student residence, particularly during the first year, has a significant affect on student success (Astin, 1975, 1977; Chickering, 1974; Pascarella & Terenzini, 1991). More recently, Astin (1993b) revisited this issue. Astin's work has focused on an input-environment-outcome model (IEO) as a conceptual guide for

studying the development of college students. Using the data from the Cooperative Institutional Research Program, containing longitudinal data including over 500,000 students from 1,300 different institutions, Astin (1993b) identified direct relationships between student housing (environment) and outcomes. Astin found a direct effect between campus residence and attainment of the bachelor's degree, satisfaction with faculty, and willingness to re-enroll in the same college. Combining on-campus residency with other intentional programs results in additional positive effects.

*University Seminar Course*

First-year programs demonstrate great contributions to student retention, particularly at 4-year colleges and universities. Habley and McClanahan (2004) indicate that there are several promising types of first-year programs including university seminar courses, learning communities and integration of academic advising with first year programs. A variety of forms of university seminar courses exist at colleges and universities (Upcraft, Gardner, & Barefoot, 2005). The National Survey of Student Engagement (NSSE) (2005), found that when different institutional and student characteristics were controlled, those who enrolled in a university seminar course were more academically challenged and interacted more frequently with faculty members. In addition, students who took this course were more likely to use the resources available on campus and were more likely to perceive the campus environment as supportive compared to those who did not take this course (NSSE, 2005).

At San Diego State University, in 2001, a one-unit course served primarily as an orientation to college. Each section of the university seminar course had similar "field trips" to the library, advising center and career services office. The remainder of the curriculum was at the discretion of the instructor teaching the course; however, common topics included time management, stress management, note taking, exam preparation, etc.

The combination of on-campus residency during the student's first year and enrollment in a university seminar/freshman success course can yield substantial increases in student retention (Fidler & Moore, 1996). Their longitudinal study of eight successive freshman cohorts at a large public institution found that participating in a freshman orientation seminar on-campus and living on campus reduced freshman dropout rates. Students who both participated in the seminar and lived on campus had the lowest dropout rate, whereas those who did neither had the highest dropout rate.

*Educational Opportunity Program*

The Educational Opportunity Program (EOP) is available to students throughout the California State University (CSU) system. The intention of this program is to improve the academic support of low-income and educationally disadvantaged students (Educational Opportunity Program Contributes to California's Economic Success, 2006). The system deems these students to have the potential to be successful at one of the CSU campuses; however, the program acknowledges the potential challenges posed by economic or educational circumstances. In addition to providing assistance in the areas of admissions and

financial aid, the program also offers a variety of academic support programs. Academic support includes summer programs prior to freshmen year (Summer Bridge) to strengthen writing and math skills as well as orientation sessions to acquaint students with the university and its expectations. Throughout their enrollment, EOP students can take advantage of counseling, tutoring and advising services. According to the CSU web site, students in EOP are more than twice as likely to remain in college as students from similar backgrounds who do not participate in the program (Educational Opportunity Program Contributes to California's Economic Success, 2006). Empirical studies to support this claim however, were not identified.

*Engagement*

Many years of research address the concepts of integration, engagement and campus environments. Previous studies have suggested that student engagement can positively mitigate the relationship of pre-college characteristics including ethnicity, high school GPA and test scores when examining student success (Astin, 1993; Hoffman, 2002). Despite maintaining a glut of information in their databases, institutions are much less likely to collect and maintain data related to student engagement. Tinto's research in this area is seminal however; it has recently faced criticism related to the application of his postulations to minority students (Tierney 1999). Tinto (1987) found that given students' demographic characteristics and pre-entry intentions, goals and commitments, students' retention by the university was a function of how they socially and academically integrated into the institution.

Students' decisions to persist or withdraw are significantly affected by the degree to which they integrate into the collegiate environment (Tinto, 1982, 1987).

Several large-scale studies using nationally representative data reinforced the importance of involvement in relation to student persistence (Astin, 1993b; Horn, 1998; Tinto 1998). Evidence also exists to support the notion of student involvement as an important link to persistence for minority students. Specifically, the earlier these students become involved in the university, the better (Berger & Milem, 1999). It is important to note, however, that this quantitative, one year longitudinal study of 718 students was conducted at a highly selective private residential research institution in the southeast, thereby limiting the ability to generalize the results to other types of institutions throughout the country.

Over the past several decades, numerous studies, using campus specific to nationwide databases, have related a variety of factors to student retention and persistence. There are however, a limited number of studies examining the factors predicting degree attainment of African American, Hispanic and White students. Similarly, few studies examine intra-institutional achievement gaps in degree attainment between students who enter the university based on different admissions criteria stemming from high school grade point averages and standardized test scores.

# CHAPTER 3

## Methodology

San Diego State University (SDSU) does not report graduation rates disaggregated into the two admissions categories; students who met the California State University System (CSU) admissions criteria and those who met the higher SDSU admissions criteria. Exploration of the graduation rates of these two distinct admissions cohorts is important to the university's conversation about improving retention and graduation rates and ensuring high rates of degree attainment for all admitted students. This study included a quantitative analysis of extant data at SDSU to determine the predictors for graduation for students who entered the university under these two distinct admissions criteria.

At SDSU a gap exists among the graduate rates of White, African American and Hispanic students (Graduation Rates by Ethnicity, 2006). Therefore, another purpose of the quantitative analysis was to determine whether variables related to demographic factors, academic preparation, or university specific programs and services accounted for the greatest variation in graduation rates of students in the three racial/ethnic groups whether they were admitted based on the higher SDSU criteria or the lower CSU admissions criteria.

While quantitative analyses helped measure the power of relationships among clearly established quantifiable variables, other strategies were needed to identify and assess the power of other variables that might influence persistence to graduation. Qualitative methods supplemented this quantitative analysis by exploring how graduates, admitted under the lower CSU admissions criteria described their

personal, as well as the university support systems that contributed to their retention and graduation. Described below are the methodologies for both the quantitative and qualitative analyses.

## *Quantitative Analysis*

### *Hypotheses*

$H_a$ – There will be a difference in the graduation rates for White, Hispanic and African American students within each of the admissions cohorts (i.e. those with similar academic preparation), with Whites graduating at a greater rate than Hispanic and African American students.

$H_a$ – Different factors will predict degree attainment for students from the low-eligibility index admissions cohort and the high eligibility index admissions cohort.

$H_a$ – Different factors will predict degree attainment for White, Hispanic and African American students.

### *Site/Context*

The site of this research was San Diego State University, a large, public institution in the west. The Carnegie classification for this institution is doctoral/research university-intensive. There are approximately 24,000 full-time undergraduate students at SDSU. The campus was selected as the site of the study because of the demographics of the student population, the geographic proximity to the researcher and ease of access based on the researcher's position within the university. Furthermore, SDSU experiences disparate outcomes as evidenced by annual retention, graduation and dropout rates.

San Diego State University admits students based on a formula known as an eligibility index. This index is a calculation of the student's high school GPA and their score on the SAT or the ACT. The formula for the eligibility index is either (high school GPA X 800) + (SAT Score) or (high school GPA X 200) + (10 X ACT

Composite Score). This formula is common throughout the California State University System. Unique, however is the status of San Diego State University as an impacted campus and the campus' distinction between admissions categories. According to the Chancellor's Executive Order 563, a campus can apply for impacted status when its pool of the state system's eligible applicants within the first month of the admissions cycle (combined with the currently enrolled students), significantly exceeds the number that can be accommodated on the campus. In May of 1997, SDSU became the first campus within the system to receive impaction status (San Diego State University, 2003).

Concurrently, San Diego State University's University Senate recommended the adoption of an 80/20 admissions model. Under this policy, the university grants 80% of the freshmen admissions spaces solely on the academic merit of the applicant. The remaining 20% of applicants are admitted based upon their academic merit as well as other factors; however, they must meet the minimum CSU eligibility requirement. In the original plan, the supplemental criteria included ethnicity and race. Proposition 209 however, passed in the fall of 1997, prohibits the use of race and ethnicity in the admissions criteria (San Diego State University, 2003).

Two primary groups of students gain admission to San Diego State University, each with distinct criteria for admissions. Eighty percent of the students attain the SDSU eligibility index criterion. The vast majority of students take the SAT instead of the ACT. As a result, this study will focus on the eligibility formula and data related to SAT scores only. This eligibility index criterion for the fall 2001 admissions cycle was 3525. For example, a student with a high school grade point

average of 3.0 would have needed an SAT score of 1,125 in order to meet the eligibility criterion for the fall of 2001 (3.0 x 800 = 2,400. 2,400 + 1,125 = 3,525). The remaining twenty percent of the spaces in the freshmen cohort are reserved for the population who meet the lower CSU criteria, but do not attain the SDSU eligibility index criterion. The CSU eligibility index remains constant at 2,900. A student with a 3.0 grade point average would have needed an SAT score of 500 to earn admission based on the CSU criteria in the fall of 2001 (3.0 X 800 = 2,400. 2,400 + 500 = 2,900).

In previous years, a distinct achievement gap was evident in the graduation rates between White students and Black and Hispanic students. Notably, the freshman class of 1999 had six-year graduation rates of 57.1%, 40.3% and 26.2% for White, Hispanic, and African American students respectively (SDSU, 2006). Clearly, an achievement gap existed. What was unknown however was whether an achievement gap in six-year graduation rates existed between students admitted with the same academic preparation as measured by the eligibility index.

The one-year retention rates for the fall 2001 freshmen cohort provided additional evidence of gaps in student achievement among different racial/ethnic groups. Among freshman admitted in the fall of 2001, 78.5% of White students, 71.2% of Hispanic students and 70.7% of African American students continued to be enrolled in the fall of 2002. This demonstrates the intra-institutional stratification described by Bensimon (2004).

Previous research did not explore specific predictors of graduation for each of the admissions cohorts within one university. More specifically, predictors of

graduation for each of the various ethnicities within the different admissions cohorts had not been investigated. This research was designed to explore these two constructs further.

*Sample*

The sample of students for this study was the population of the entering freshman class of 2001. The cohort of first-time freshmen included 4,521 students. Only those who identified themselves as White (n=2,141) Hispanic (n=839) and African American (n=225) were included in the study. Furthermore, this study concentrated only on those freshmen of traditional college-entry age (i.e. date of birth was after 12/1/81, meaning they were approximately age 20 or less when they enrolled in the fall of 2001). Further exclusion of athletes, international students and any other students granted admission to the university using different criteria resulted in a final sample size of White (n=1,697), Hispanic (n=638) and African American (n= 164) students for a total population of 2,499. The entering freshman class of 2001 was the focus of the study because the university maintains information on the six-year graduation rates of its students. This was the most recent cohort available for study.

*Data Collection*

The data for analysis existed in distinct university databases containing different pieces of the information of interest. Consolidating records from the distinct databases required significant effort. Entrée to the site was available via permission of university administrators obtained during a meeting to describe the potential study and seek university buy-in. Key administrators expressed interest in the results of

the study and committed to providing access to data. The university records office retrieved the majority of data from the Student Information Management System. The information obtained included student gender, ethnicity, parental income, highest parent educational level, high school grade point average, scores on the SAT, ACT, English Placement Test (EPT) and Entry Level Math Exam (ELM), whether or not the student participated in the Educational Opportunity Program, and whether or not the student enrolled in a university seminar course their first year. The Office of Housing Administration provided a second set of information. These data identified the students who lived in university residence halls in the fall of 2001. Cross-referencing these sets of data allowed files to be merged in preparation for data analysis.

*Data Analysis*

Rather than focusing on factors that contribute to student attrition, this study burgeons from a strengths-based perspective to determine factors that contribute to degree attainment. Analysis included the use of both descriptive and inferential statistics. The Statistical Package for the Social Sciences (SPSS) version 15 for Microsoft Windows was used to conduct the quantitative analysis. Creswell (2002) described several requirements for appropriate statistical software. This program met those requirements. Furthermore, SPSS is often cited as a rigorous software package for quantitative analysis (Creswell, 2002; Pedhazur, 1997).

Coding of the data preceded analysis. The majority of the factors were coded as categorical variables, with 1 indicating presence and 0 indicating absence of the variable for each student. The SAT scores and high school GPAs remained as raw

scores. The English Placement Test (EPT) scores and the Entry-Level Mathematics (ELM) scores were recoded to categorical variables. These categorical variables were transformed to reflect the strengths-based approach. If the student did not need remediation in writing the code was 1, if they required remediation, the code was 0. This process was repeated for the math scores. Finally, students were coded as a member of the high eligibility index cohort if they met the SDSU eligibility criteria (a score of 3,525), or as a member of the low eligibility index cohort if they were enrolled based on the lower CSU eligibility criteria (a score between 2,900 and 3,424).

The only continuous variable besides the SAT score and high school grade point average was family income. The CSU Data Element Dictionary for the Student Information Management (2006) defines these increments. The values indicate annual income and are established as 1= less than $6,000, 2 = $6,000-$11,999, 3 = $12,000-$23,999, 4 = $24,000-$35,999, 5 = $36,000-$47,999, 6 = $48,000-59,999, 7 = $60,000 or more. Students who could not estimate their family income, who were independent, or who did not respond were not included in the analysis of data utilizing this demographic variable. The data analysis followed the coding.

To answer the first research question, the graduation rates of the African American, Hispanic and White students in each of the admissions criteria were determined through descriptive statistics. Specifically, cross tabulation of the graduation of students in each of these groups resulted in a matrix containing the graduation data. Pallant (2005) states that Chi-square tests should be used

determined whether or not there is a significant relationship between two categorical variables. When using a 2 by 2 correlation table, the Yates' Correction for Continuity is the preferred test because it corrects for the overestimate of the Chi-square value (Pallant, 2005). In this case, the Yates' Correction for Continuity determined if the gap in graduation rates between the low eligibility index cohort and the high eligibility index cohort for each of the ethnicities was statistically significant.

The dependent variable in research questions two through five was dichotomous, students either graduated or they did not. Therefore binary logistic regression was the appropriate statistic to determine the predictors for graduation. Logistic regression is appropriate, and the most versatile statistical model when the dependent variable is dichotomous (Pedhazur, 1997). In this case, the dependent variable was graduation from the university within the six-year period, with the dichotomous response yes/no. Peng, So, Stage and St. John (2002) note that logistic regression is well suited for categorical variables including staying in or dropping out of college. The six-year graduation period is the standard denominator; acknowledging the college-going patterns of today's college students, many of whom attend the university part-time (Kuh et al., 2005). Unlike other forms of regression, logistic regression does not assume normal distribution of scores for the predictor variables; however, it is sensitive to high correlations among the independent or predictor variables (Pallant, 2005).

As suggested by Pallant (2005), a correlation matrix ensured that the independent variables were not highly correlated. Tabachnick and Fidell (2001),

recommended removing one of the variables if two independent variables have a bivariate correlation greater than 0.7. In this case, whether or not the student was a first-generation college student was highly correlated with highest parental education level. Based on the research by Pascarella et al. (2004) regarding the experience of first-generation college students, this variable was retained in the model and highest parent education level was omitted.

The purpose of quantitatively based research questions two through four was to examine the predictors of graduation for various subsets of the population of the entering freshman class of 2001. The statistic utilized to determine the predictors was binary logistic regression. The fifth research question also used the binary logistic regression statistic to determine the amount of variation in graduation rates explained by demographic, high school and campus related variables for each of the sub-populations. Chapter 4 outlines the results of the analyses and Chapter 5 provides a discussion of the findings.

### *Qualitative Analysis*

Understanding persistence from students' perspectives is not possible through quantitative analysis alone. In contrast to quantitative analysis that relies on mathematics and statistical analysis, qualitative research designs attempt to preserve the form and spirit of human behavior (Lindlof, 1995). Qualitative research revels in its exploratory and inductive process (Merriam, 1988). Interviews helped shape meaning and form understanding of how recent graduates who entered the university in the lower admissions eligibility cohort described the university and personal support systems and their personal characteristics that contributed to their academic

persistence to degree. Kvale (1996) stated, "The qualitative research interview attempts to understand the world from the subjects' points of view, to unfold the meaning of peoples' experiences…" (p. 1).

The qualitative inquiry delved into the lived experiences of soon to be and recent graduates. The intent of this portion of the study was to understand the factors students admitted under the lower eligibility index believe contributed to their success. Interviews were conducted in May and June 2007. Students who were eligible to participate in May 2007 graduation ceremonies were interviewed. These students identified both personal and institutional supports that helped them attain their degree.

*Participant Identification*

A total of 54 White, African American and Hispanic students who entered the university in the fall 2001 from the lower eligibility index admissions cohort were approved to participate in graduation for spring 2007. These students were sent an invitation to participate in the interview via an Email sent by the university to the Email address the student had on record with the university (Appendix A). Students who did not respond to the Email were sent a second request approximately ten days to two weeks later (Appendix B). A total of eight students responded and agreed to be interviewed. The participants included three Hispanic males, one Hispanic female, one African American male, one African American Female, one White female and one White male.

*Interviews*

The interviews occurred between May 9, and June 14, 2007 on campus, at times arranged with the interviewees. Written consent was acquired from each participant prior to the interview using the consent forms stamped by the University of California San Diego and California State University San Marcos, and approved by San Diego State University (Appendix C). Participants also selected pseudonyms for use in the interview, transcription and final report. The researcher reinforced three important facts to each interviewee: first, that their participation was voluntary; second, that the information they shared was confidential and all identifying information would be replaced with pseudonyms; and third, they could discontinue the interview at any time. Participants agreed to spend approximately one hour describing their experience at San Diego State University.

The interview length averaged approximately thirty-two minutes. The participants provided responses to six open-ended questions. The questions burgeoned from a strengths-based perspective (Appendix D). Appreciative inquiry provided the lens for exploration of the successful college experience of those admitted to the university meeting the lower admissions criteria. Cooperrider and Srivastva (1987) describe appreciative inquiry as a mode of action research, specifically it:

> …engenders a reverence for life that draws the researcher to inquire beyond superficial appearances to deeper levels of the life generating essentials and potentials of social existence. That is, the action researcher is drawn to affirm, and thereby illuminate, the factors and forces involved in organizing that serve to nourish the human spirit (p. 131).

The primary purpose of the questions was exploration of the students' perspective of their personal as well as the university support systems that contributed to their persistence to graduation.

The interview questions were designed to acquire the graduates' perspectives about the personal and university support systems and personal characteristics they believed contributed to their retention and ultimate degree attainment. The questions provided opportunities for the participants to describe their engagement in the university. Additionally, the participants offered advice to a fictional incoming student who reminded them of themselves. Probing follow-up questions solicited specific or detailed information not ascertained in the original response.

The original questions and the probing follow-up questions explored the attributes the students believed most significantly affected their success. These areas included: adjustment to the campus, social and academic integration (Tinto, 1993), student involvement and engagement (Astin, 1984, 1993; Kuh, Kinzie, Schuh, & Whitt, 2005; Kuh et al., 2005), interactions with peers (Bean, 1985; Kuh et al., 2005), and interactions with faculty (Pascarella, 1985).

The interviews focused on strengths the individuals identified; both personal strengths and university strengths, therefore the risk of harm to participants in this study was negligible. None of the participants chose to end the interview early, nor did any participants express any duress or discomfort with any of the questions. Each participant received $30.00 cash in exchange for his or her time. Each participant signed a receipt for the cash. The secondary benefit to the participants, in addition to

the financial remuneration, was the opportunity to reflect on their personal experience at SDSU and their success.

*Data Management*

Tape-recording and transcription preserved the data. Each participant received the opportunity for correction and elaboration of the transcript through member checks (Lincoln & Guba, 1985). Contact summary sheets aided in the documentation of the characteristics of the interview. Contact summary sheets can serve as a tool to aid in the reflection of the interview (Miles & Huberman, 1994). The essence of the contact summary form included the issues and themes that emerged from the interview, a summary of the information obtained, or not obtained for each question, and any other important, prominent, or interesting reflections from the interview. The contact sheet served as a useful tool for prompting additional probes and clarifying questions for subsequent interviews.

*Data Analysis*

The transcriptions resulted in approximately 50 pages of data. Analysis of the transcripts began with a start list of codes. These codes were refined through an evolving and deductive process. The data analysis followed the format suggested by Creswell (2003). The data analysis utilized a phenomenological approach to uncover the essence of these students' experiences. Coding and recoding of data resulted in a reduction of themes, presented in Chapter 4 and discussed in detail in Chapter 5.

Analyst triangulation increased the credibility of the analysis. Three other professionals within the field of student affairs, with combined professional experience in excess of 35 years, independently reviewed the coding schemata and

compared their findings with the researcher. According to Patton (1990), "Triangulating observers …helps reduce the potential bias that comes from a single person doing all the data collection and provides means of more directly assessing the reliability and validity of the data obtained" (p. 468). Similarly, Creswell (2003) states that this form of peer debriefing can enhance the accuracy of the findings.

The qualitative research enhanced and expanded upon the findings of the quantitative analysis. Exploring the lived experience of the students provides a rich description and deep understanding of their perspectives, challenges, and support systems during their collegiate tenure.

### *Study Limitations*

While this study attempted to put together new pieces of the persistence to graduation puzzle, limitations of this study must be considered. One cohort of students binds this study. The fall 2001 cohort is the most recent class admitted, for whom 6-year graduation rates are accessible. The study is limited to one public university, with an unusual admissions policy. While the findings may offer a useful starting point to understand what SDSU may do to enhance its retention and persistence to graduation of students, particularly those admitted under the lower admissions criteria, the findings from this study may or may not be similar to those at other colleges and universities. This study also did not track the ongoing educational pursuits of students who were not retained. It is presumable that some students transferred to other universities, where they have since attained their baccalaureate degree.

Noted below are the delimitations of the study. First, this study excludes examination of other student ethnicities. Nationally, the achievement gap is largest between Whites and Black and Hispanic students, therefore these groups were the subject of the study. In addition other groups of students were excluded from this study including: athletes, international students, nontraditionally aged freshman and other students admitted under special criteria who do not fit within one of the two primary admissions groups and/or do not consist of a critical mass. Finally, this study does not address the graduation rates of transfer students.

Chapter 4 provides a description of the findings from this research. Chapter 5 offers discussion of the findings and implications for practice.

# CHAPTER 4

## Results

The purpose of this study was to examine the six-year graduation rates for students admitted to San Diego State University (SDSU) under two distinct admissions criteria. Eighty percent of the students admitted to SDSU meet the university's admissions criteria known as the eligibility index, while the remaining 20% of the spaces in the entering freshman class are reserved for students who attain the minimum California State University System eligibility index, but who do not meet the campus' higher eligibility index. The eligibility index is a calculation of the student's high school GPA and their score on the SAT or the ACT. The formula for the eligibility index is either (high school GPA X 800) + (SAT Score) or (high school GPA X 200) + (10 X ACT Composite Score).

This study examined the predictors for graduation for the two different admissions cohorts who entered the university as first time freshmen in fall 2001. Six research questions and three related hypotheses guided this study. This section will address the findings of each research question in order. It is important to note that the statistically significant results of the logistic regression analyses ($p \leq .05$) are the focus of the discussion related to the quantitatively based research questions.

### *Data*

The university's data office provided information for all White, Hispanic, and African American students entering the university in fall 2001. Table 1 provides an overview of the demographics of the admitted students and those included in the

study. This study focused on students of traditional college-entry age (students born prior to 12/1/1981, approximately 20 years old or younger when they enrolled as freshmen in 2001). In addition, other students omitted from the study included: athletes, international students, and students admitted through other special criteria.

Table 1:

Freshmen Admitted Fall 2001, by Ethnicity and Inclusion in Study

| | African American | Hispanic | White |
|---|---|---|---|
| Total Admitted | 225 | 839 | 2,141 |
| Included in Study | 164 | 638 | 1,697 |
| Percent included in Study | 72.89% | 76.04% | 79.26% |

It is important to recognize that the proportion of incoming freshmen in the 80% (higher) eligibility index admissions cohort and the 20% (lower) eligibility index admissions cohort was not constant across ethnic populations. Table 2 displays the percentage of the students of each ethnicity who enrolled as freshmen in 2001 in each of the two eligibility index cohorts. Whereas 80% of all freshmen enrolled were in the higher eligibility cohort, only 54% of the African American students and 68.5% of the Hispanic students were enrolled in the higher eligibility cohort. In contrast, 86% of White students were enrolled in the high eligibility index cohort.

Table 2:

Ethnic Dispersion of Students into High and Low Eligibility Index

| | African American | | Hispanic | | White | | All | |
|---|---|---|---|---|---|---|---|---|
| High Eligibility Index | 89 | 54% | 437 | 68.5% | 1462 | 86% | 1,988 | 79.6% |
| Low Eligibility Index | 75 | 46% | 201 | 31.5% | 235 | 14% | 511 | 20.4% |

Data retrieved for each student included three categories of variables: demographic variables, those related to high school preparation for college and campus related factors. The demographic data included the student's ethnicity, gender, family income and parental education level (coded to reflect status as a first-generation student). The set of high school related factors included students' high school GPA, SAT score, admissions eligibility index score and number of college credits earned from advanced placement classes. Student performance levels on the English Placement Test and the Entry Level Mathematics Exam were also included to indicate whether or not the student was required to take remedial classes. Finally, the college related factors included information regarding students' enrollment in a freshman seminar course, involvement in the Educational Opportunity Program, and the students' graduation status. The Office of Housing Administration provided the list of all students who lived in the residence halls during the fall 2001 semester. This list was cross-referenced with the data set obtained from the institutional data office and the files merged.

*First Research Question*

*Research Question 1: What are the six-year graduation rates (disaggregated by ethnicity) of students who entered the university with similar academic preparation (measured by high school grade point average and score on standardized test)?*

For all three ethnicities, the students who entered the university under the lower admissions criteria, graduated at lower rates than their peers who met the higher admissions criteria. For Hispanic students, the difference in graduation rates between the two admissions cohorts was statistically significant ($p \leq 05$). This was similarly true for White students. In contrast, the difference in graduation rates for the African American students from the two eligibility index cohorts was not statistically significant.

A comparison of the graduation rates across racial/ethnic groups yielded different results for each of the two admissions cohorts. Within the lower eligibility index admissions cohort, African Americans and Whites were more likely to graduate than Hispanic students. In contrast, in the higher eligibility index admissions cohort, White and Hispanic students were more likely to graduate than African American students. Table 3 displays the results of the cross-tabulation for the graduation rates by ethnicity within each of the admissions criteria cohorts.

Table 3:

Six-year Graduation Rates by Ethnicity

| Ethnicity | African American | Hispanic | White |
|---|---|---|---|
| Low Eligibility Index | 49.3% | 41.8% | 48.5% |
| High Eligibility Index | 55.1% | 60.0% | 61.8% |
| Total | 52.44% | 54.23% | 59.93% |

This information results in a rejection of the first hypothesis. The White students did not outperform the African American and Hispanic students in both groups. In the low eligibility index cohort, the African American students graduated at higher rates than the White students.

### *Binary Logistic Regression*

The second through fifth research questions utilized the statistic binary logistic regression for analysis. Further explanation of this tool and the information described in the findings is included prior to moving on to the findings for the next set of research questions. Logistic regression determines how well the predictor variables explain the dichotomous dependent variable; in this case graduation (Pallant, 2005). Binary logistic regression explains the outcome in terms of the probability of belonging to one group (graduates) divided by the probability of

belonging to a different group (non-graduates) (Coughlin, 2005). A brief description of the information covered in the findings for each logistic regression is listed below.

Several pieces of information presented in the findings provide information regarding the predictability of these models. First, however it is important to note that Logistic regression is different from other regression models in that it does not assume a normal distribution of scores for the predictor variables (Pallant, 2005). Logistic regression also does not assume homoscedasticity or linearity of relationship between the independent variables and the dependent (Garson, 2007). Furthermore, true R square values, such as those found in multiple regression analyses are not available with logistic regression. Instead, the Cox & Snell and Nagelkerke R Square values offer an indication of the amount of variation in the dependent variable explained by the model (Pallant, 2005). These values, noted as pseudo R squares, are represented in numbers between 0 and 1. For example, if the Cox & Snell and Nagelkerke R Square values are .135 and .172 respectively; this suggests that between 13.5% and 17.2% of the variability in the dependent variable is accounted for by this set of predictor variables.

In Addition, it is common to report the results of both "goodness of fit" tests, the Omnibus Test of Model Coefficients and the Hosmer and Lemeshow Test. Pallant (2005) states that "The Omnibus Test of Model Coefficients provides an overall indication of how well the model performs, over and above the results obtained in a test with none of the predictors entered into the model" (p.167) For the Omnibus Test of Model Coefficients, the desired results are highly significant values ($p. \leq .05$). The Hosmer and Lemeshow test is described by SPSS as the most reliable

test of model fit (Pallant, 2005). In contrast to the Omnibus Test, for the Hosmer and Lemeshow Test, a significance value of p. $\leq$ .05 indicates poor model fit.

Furthermore, an indication of how well the model is able to predict graduation or no graduation is also typically reported in the classification table. This is sometimes referred to as the percentage of accuracy. Garson (2007) warns, however that the results from the classification table should not be used to measure the goodness-of-fit of the model because they ignore actual predicted probabilities. In fact, Garson (2007) encourages use of the Hosmer and Lemeshow Test.

The results of each research question are presented in a table. Several pieces of information are included on each table. It is important to note that for ease of readability only the statistically significant variables were included in the tables. The first column indicates the variables included in the equation. The second column provides the B values. These are the values used to calculate the probability if a cases falling into a category (graduation or no graduation) (Pallant, 2005). The direction of the B values indicates the directionality of the relationship. For example, a negative B value would indicate that as the value of independent variable increases, the chance of graduating decreases. The standard error (S.E.) around the coefficient is reported in the third column.

The value of the Wald test or statistic is reported in the fourth column. The Wald statistic is often used to test the significance of the individual logistic regression coefficients for each independent variable. The ratio of the logistic coefficient B to its standard error S.E., squared, equals the Wald statistic (Garson, 2007). The fifth column indicates degrees of freedom (d.f.). It is important to refer

to the sixth column, Sig., which indicates whether or not the variable is a significant predictor of the outcome (graduation). Again, variables statistically significant ($p. \leq .05$) were reported.

Finally, the last three columns in the table also provide additional important information. The Exp(B) column indicates the odds ratio for each of the independent variables. The odds ratio describes the chance of graduation (dependent variable) with each increase in the predictor variable. For a dichotomous independent variable, the odds of graduation are described if the variable is present, i.e. coded 1. If the Exp(B) is greater than one, the odds increase, if the Exp(B) is less than one, the odds decrease. Furthermore, the closer the number is to one, the less effect the variable has on the outcome. For example, if the Exp(B) for the variable lived on campus first year was 2.333, this indicates the odds of a person graduating increased by a factor of 2.333 over those who did not. Stated another way, if the student lived on campus their first year, they were 2.333 times more likely to graduate than those who did not. The final columns depict the lower and upper confidence intervals. The confidence level is established at 95.0%. Therefore it can be stated with 95% confidence that the range of values between the lower and upper confidence level encompass the true value of the odds ratio (Pallant, 2005).

## *Second Research Question*

*Research Question 2: What are the predictors of graduation for students within the low and high eligibility index admissions cohorts?*

A binary logistic regression model determined the predictors of graduation for each of the two admissions cohorts. Each model included the same three groups of factors. The demographic variables included gender, family income and status as first-generation college student. The high school related variables included high school grade point average, score on the SAT, number of units of advanced placement credit obtained, and math and writing aptitude (whether or not the students needed remediation in either subject area). Finally, the campus related variables included first year residency (on or off campus), participation in the Educational Opportunity Program, and enrollment in the university seminar course.

### *Low Eligibility Index Cohort*

In 72.8% of cases, the binary logistic regression model correctly predicted which freshmen from this fall 2001 cohort would have graduated by 2007. In 58.7% of cases, the binary logistic regression model correctly predicted which freshmen from fall 2001 would not have graduated by 2007. The Omnibus Test of Model Coefficients (Chi-square 48.142, df = 11, p = .000) and the Hosmer and Lemeshow Test (Chi-square 14.548, df = 8, p = .069) indicate that the model is a good fit. The pseudo R square values (Cox & Snell and Nagelkerke) suggest that this model explains between 11% and 14.7% of the variance in graduation rates. Several predictors made statistically significant contributions in explaining the variance in graduation rates for this group. Table 4 indicates that the high school related factors

of advanced placement (AP) courses, high school GPA, and the absence of need for remedial math were significant ($p. \leq .05$). Additionally the college related factors of first year campus residency and participation in the university seminar course (a one-unit freshman course) were significant ($p. \leq .05$).

All of these factors were statistically significant as predictors; however, the variables had different levels of power in predicting graduation. For example, for each additional unit of college credit a student earned through Advanced Placement coursework, the odds of graduating increases slightly (by a factor of 1.069), with all other factors being equal. Furthermore, for each point increase in high school grade point average, the odds of graduating increase by a factor of 3.885. Math ability was also extremely important. For students who did not need math remediation upon entering the university their odds of graduating were 2.535 times greater than those who required remediation. Specific choices made during the first year of college were also important for students who entered the university from the low eligibility index cohort. All other things being equal, those who lived on campus during their first year were almost two times more likely to graduate compared to those who lived off campus. Furthermore, the odds of graduating for students who enrolled in the university seminar course was 1.653 greater than those who did not.

Table 4:

Logistic Regression Predicting Graduation, Low Eligibility Index Cohort

| | B | S.E. | Wald | df | Sig. | Exp (B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Advanced Placement | .066 | .032 | 4.376 | 1 | .036 | 1.069 | 1.004 | 1.137 |
| High School GPA | 1.357 | .657 | 4.263 | 1 | .039 | 3.885 | 1.071 | 14.090 |
| Math Remediation Not Required | .930 | .262 | 12.573 | 1 | .000 | 2.535 | 1.516 | 4.238 |
| Enrolled in University Seminar Course | .502 | .222 | 5.098 | 1 | .024 | 1.653 | 1.069 | 2.556 |
| Lived on Campus First Year | .642 | .221 | 8.437 | 1 | .004 | 1.900 | 1.232 | 2.931 |
| Constant | -4.34 | 2.6 | 2.779 | 1 | .096 | .013 | | |

*High Eligibility Index Cohort*

The second logistic regression found that the students admitted to the university with the higher eligibility index had some of the same, and one different predictor from the low eligibility index admissions cohort. For these students one demographic factor, two high school factors and one campus related factor predicted graduation. The classification table indicated that this model correctly predicted 89.1 % of students who graduated and 18.9% of those who did not. The Omnibus Test of Model Coefficients (Chi-square 59.066, df = 11, p = .000) and the Hosmer and Lemeshow Test (Chi-square 15.056, df =8, p = .058) indicate that the model is a good fit. The model explains between 3.8% and 5.1% of the variance in graduation outcome as indicated by the pseudo R square values (Cox & Snell and Nagelkerke).

Four predictors made statistically significant contributions in explaining the variance in graduation rates for this group.

Table 5 displays the four statistically significant predictors of graduation for the high eligibility index students. Unlike the low eligibility index students, one demographic factor was a predictor of graduation. Specifically, for each categorical increase in family income for dependent students, the likelihood of graduating increases by a factor of 1.075. With regard to high school factors, two variables, high school GPA and acquisition of math skills were predictors. For each unit increase in grade point average, the odds of graduating increased by a factor of 1.996. If students did not require remediation in math upon entering the university, their odds of graduating increased by a factor of 1.516. The odds of a student from this cohort graduating within six years increased by a factor of 1.685 if they lived on campus their first year.

Table 5:

Logistic Regression Predicting Graduation, High Eligibility Index Cohort

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Family Income (Dependent Students) | .072 | .035 | 4.225 | 1 | .040 | 1.075 | 1.003 | 1.152 |
| High School GPA | .691 | .213 | 10.546 | 1 | .001 | 1.996 | 1.315 | 3.028 |
| Math Remediation Not Required | .416 | .160 | 6.776 | 1 | .009 | 1.516 | 1.108 | 2.073 |
| Lived on Campus First Year | .522 | .114 | 21.085 | 1 | .000 | 1.685 | 1.348 | 2.105 |
| Constant | -2.506 | .987 | 6.452 | 1 | .011 | .082 | | |

This information results in an acceptance of the second hypothesis. Different predictors of graduation were found for the two different admissions cohorts.

### *Third Research Question*

*Research Question 3: Are the variables associated with academic preparation the most predictive variables of graduation for all three ethnic groups within the two different admissions cohorts?*

To answer this question, the binary linear regression models included graduation as the dichotomous dependent variable and high school related factors as the independent variables. The high school related variables included SAT score, GPA, advanced placement units and whether or not the student required remediation

in writing or math. The model was repeated for the low and high eligibility index admissions cohorts and for each ethnic group within these admissions cohorts. It is important to note that the eligibility index is a formula combining the SAT score and the high school GPA, two of the variables of this model.

Some of the models did not demonstrate "goodness of fit" by the Omnibus Tests of Model Coefficients; this is likely due to the small population, as this occurred most often with the Hispanic and African American subsets. O'Connell (2006), recommends utilizing alternative strategies for assessing model fit (including the Hosmer and Lemeshow Test) when small sample sizes are present. The Hosmer and Lemeshow Test ensured "goodness of fit, particularly when the Omnibus Test of Model Coefficients was not significant. The Hosmer and Lemeshow Test computes a chi-square test based on the observed and predicted number of subjects in the deciles they are placed into based on predicted probabilities (Stokes, Davis, & Koch, 1995). The test statistic is compared to a chi-square distribution with number of deciles groups minus two degrees of freedom. The null hypothesis states that the observed and predicted values are equal. The model is a good fit if we do not reject the null hypothesis.

*Low Eligibility Index Cohort*

As a cohort, two of the high school related variables were predictors for graduation for the students admitted with a lower eligibility index. For students in this group, high school GPA and not needing remediation in math were significant predictors of graduation. The classification table indicated that this model correctly predicted 61.1% of the cases. The Omnibus Test of Model Coefficients (Chi-square 30.888, df = 5, p = .000) and the Hosmer and Lemeshow Test (Chi-square 4.922, df =8, p = .766) indicated that the model is a good fit. The model explains between 6.1% and 8.1% of the variance in graduation outcome as indicated by the Cox & Snell and Nagelkerke pseudo R square values.

Table 6 displays the two statistically significant high school related predictors for the low eligibility index admissions cohort. High school grade point average is a predictor of graduation. For each unit of increase in grade point average, the likelihood of graduating increases by a factor of 7.471. The second high school related predictor for this cohort is acquisition of math skills. If students did not require remediation in math upon entering the university, their odds of graduating increased by a factor of 2.377. This model was repeated for each of the three ethnic groups within this admissions cohort.

Table 6:

Logistic Regression Predicting Graduation, High School Variables,

Low Eligibility Index Cohort

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| High School GPA | 2.011 | .556 | 13.090 | 1 | .000 | 7.471 | 2.513 | 22.206 |
| Math Remediation Not Required | .866 | .229 | 14.338 | 1 | .000 | 2.377 | 1.518 | 3.721 |
| Constant | -6.670 | 2.116 | 9.939 | 1 | .002 | .001 | | |

*Low Eligibility Index Cohort, African American Students*

Within the cohort granted admission based on the lower eligibility index, each of the three ethnicities included in the study was analyzed to explore differences. The African American population within this group was rather small (n = 69). For the African American group of students in this admissions cohort, the model was not a good fit. The Omnibus Test of Model Coefficients (Chi-square 7.480, df = 5, p = .187) and the Hosmer and Lemeshow Test (Chi-square 19.134, df =8, p = .014) both demonstrated that this was not a reliable model. Although unlike multiple linear regression, the literature does not offer specific rules regarding the minimum number of observations (Peng et al., 2002), the small sample size, therefore, may account for this issue.

*Low Eligibility Index Cohort, Hispanic Students*

For the Hispanic students admitted under the lower eligibility index admissions criteria, the results were somewhat similar to the entire low eligibility

index cohort; high school grade point average was a predictor of graduation. The Omnibus Test of Coefficients (Chi-square 19.795, df 5, p = .001) and the Hosmer and Lemeshow Test (Chi-square7.298, df = 8, p= .505) both indicate that the model is a good fit. According to the Cox & Snell and Nagelkerke pseudo R square values, the model explains between 9.7% and 13.1% of the variance in graduation outcomes.

Table 7 displays the results for the logistic regression for the low eligibility index admissions cohort Hispanic students. For each unit of increase in high school grade point average, the likelihood of graduating for these students increases by a factor of 11.410. Acquisition of math skills is also worth noting as it demonstrates a trend toward significance, although it is slightly greater than the $p \leq .05$ cut off. A larger sample may provide a statistically significant result.

Table 7:

Logistic Regression Predicting Graduation, High School Variables,

Low Eligibility Index Cohort, Hispanic Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| High School GPA | 2.435 | .898 | 7.347 | 1 | .007 | 11.410 | 1.962 | 66.344 |
| Math Remediation Not Required | .730 | .375 | 3.781 | 1 | .052 | 2.074 | .994 | 4.328 |
| Constant | -7.339 | 3.361 | 4.768 | 1 | .029 | .001 | | |

*Low Eligibility Index Cohort, White Students*

The final ethnicity in the low eligibility index admissions cohort for exploration using the high school variables is the subset of White students. This model, as demonstrated by the classification table, correctly identified 61.3% of the cases. The Omnibus Tests of Model Coefficients (Chi-square 13.589, df = 5, p =.018) and the Hosmer and Lemeshow Test (Chi-square 5.044, df = 8, p = .018) both indicate goodness of fit for this model. The pseudo R square values derived from the Cox & Snell and Nagelkerke indicate that the model explains between 5.7% and 7.7% of the variation in graduation status of this group.

For the White students from the lower eligibility index admissions cohort high school grade point average was not a predictor of graduation, however acquisition of math skills was statistically significant. If students from this group did not need math remediation, the odds of their graduating increased by a factor of 2.830, all other factors being equal as demonstrated in Table 8.

Table 8:

Logistic Regression Predicting Graduation, High School Variables,

Low Eligibility Index Cohort, White Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Math Remediation Not Required | 1.040 | .354 | 8.627 | 1 | .003 | 2.830 | 1.414 | 5.665 |
| Constant | -3.198 | 3.754 | .726 | 1 | .394 | .041 | | |

*High Eligibility Index Cohort*

Additional logistic regressions analyses examined the predictive value of the high school related variables for the cohort of students who met the higher eligibility index. Similar to the lower eligibility index cohort, both high school grade point average and math aptitude were significant predictors. The classification table revealed that this model successfully predicted 96.2% of the students who graduated. Both the Omnibus Tests of Model Coefficients (Chi-square = 28.590, df = 5, p = .000) and the Hosmer and Lemeshow Test (Chi-square = 5.675, df = 8, p = .684) indicated that the model demonstrated "goodness of fit." The model only accounts for between 1.5% and 2.0% of the variation in the graduation rates.

Table 9 outlines the statistically significant variables in this equation. For each one unit of increase in high school grade point average, the odds of the student's graduation increased by a factor of 1.875. In addition, if the student did not require remediation in math, the odds of graduating increased by a factor of 1.652, all other things being equal.

Table 9:

Logistic Regression Predicting Graduation, High School Variables,

High Eligibility Index Cohort

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| High School Grade Pt. Average | .629 | .184 | 11.625 | 1 | .001 | 1.875 | 1.306 | 2.692 |
| Math Remediation Not Required | .502 | .142 | 12.576 | 1 | .000 | 1.652 | 1.252 | 2.180 |
| Constant | -1.485 | .850 | 3.051 | 1 | .081 | .227 | | |

Similar to the low eligibility index cohort, logistic regression analyses examined the predictors of graduation for each of the ethnicities within the high eligibility index admissions cohort, using the high school related variables as the independent variables.

*High Eligibility Index Cohort, African American Students*

Unlike the lower eligibility index African American student model, the Hosmer and Lemeshow Fit demonstrated goodness of fit (Chi-square 9.310, df = 8, p = .317) while the Omnibus Tests of Model Coefficients (Chi-square = 1.368, df = 5, p = .928) did not. This model, however, did not identify any predictors for graduation from the set of high school variables. Again, the small sample size may be the cause of this issue.

*High Eligibility Index Cohort, Hispanic Students*

The next logistic regression model identified the predictors of graduation for the high eligibility index admissions cohort of Hispanic students. The Omnibus Tests

of Model Coefficients (Chi-square = 11.732, df = 5, p = .039) and the Hosmer and Lemeshow Test (Chi-square = 4.498, df = 8, sig = .810) both indicated goodness of fit for this model. The Cox & Snell and Nagelkerke pseudo R square values estimate that this model explains between 2.7% and 3.6% of the variation in graduation rates. The model correctly predicted 90.7% of the students who graduated as revealed in the classification table.

Similar to the results for the large cohort for the students admitted to the university under the higher admissions criteria, both high school grade point average and math propensity were significant predictors of graduation. Specifically, for each unit increase in grade point average, the odds of graduating increased by a factor of 2.993. Correspondingly, if the student did not need remediation in math, the odds of graduating in six years increased by a factor of 1.672. Table 10 illustrates the two significant predictors for this group of students.

Table 10:

Logistic Regression Predicting Graduation, High School Variables,

High Eligibility Index Cohort, Hispanic Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| High School Grade Pt. Average | 1.096 | .431 | 6.474 | 1 | .011 | 2.993 | 1.286 | 6.964 |
| Math Remediation Not Required | .514 | .248 | 4.291 | 1 | .038 | 1.672 | 1.028 | 2.718 |
| Constant | -3.331 | 1.996 | 2.785 | 1 | .095 | .036 | | |

*High Eligibility Index Cohort, White Students*

The final logistic regression analysis to identify predictors of graduation using high school factors as the independent variables included the data corresponding to the high eligibility index admissions cohort's White students. Both the Omnibus Tests of Model Coefficients (Chi-square = 21.468, df = 5, p = .001) and the Hosmer and Lemeshow Test (Chi-square = 7.586, df = 8, p = .475) indicate goodness of fit for this model. Unlike all of the other results related to high school variables three factors were significant predictors of graduation. It is important to note, however that again this model accounted for a small amount (approximately1.5%-2.0%) of the variation in graduation rates as noted by the pseudo R square values (Cox & Snell and Naglekerke). Nevertheless, the SAT, in addition to high school grade point average and math aptitude was a significant predictor.

Table 11 displays the results of the logistic regression, and the value of these three predictors. For each unit increase in SAT, the odds of the student graduating increased by a factor of .999, which is actually a slight decrease in the odds of graduating. This is contrary to what would normally be expected. This number is so close to one however, that the effect is negligible. A one-unit increase in high school grade point average however, was likely to increase the odds of graduating by a factor of 1.715. Furthermore, not requiring remediation in math increased a student's odds of graduating by a factor of 1.647, all other factors being equal.

Table 11:

Logistic Regression Predicting Graduation, High School Variables,

High Eligibility Index Cohort, White Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| SAT Score | -.001 | .001 | 4.265 | 1 | .039 | .999 | .998 | 1.000 |
| High School Grade Pt. Aver. | .539 | .211 | 6.525 | 1 | .011 | 1.715 | 1.134 | 2.594 |
| Math Remediation Not Required | .499 | .188 | 7.049 | 1 | .008 | 1.647 | 1.139 | 2.380 |
| Constant | -.643 | 1.003 | .411 | 1 | .522 | .526 | | |

While the logistic regression analyses did not demonstrate strong models or specific predictors for African American students, we cannot ignore the presence of math aptitude as a significant predictor in all of the other models. Furthermore, high school grade point average was a predictor for all the White and Hispanic groups with the exception of the White students from the lower eligibility index admissions cohort. Overall, the models including only the high school variables did not account for a significant amount of variation in the graduation rates, particularly for students from the higher eligibility index admissions cohort.

## Fourth Research Question

*Research Question 4: Are the predictors for graduation the same for African American, Hispanic and White students admitted for each of the two different admissions criteria?*

Similar to the models described in research question three the statistic employed was binary logistic regression. In this model, however, all of the demographic, high school related and campus related factors were included to determine the predictors for graduation. This model was analyzed for each of the subpopulations. The findings for the low eligibility index admissions cohort by ethnicity precede the results of the high eligibility index admissions cohort's findings by ethnicity.

*Low Eligibility Index Admissions Cohort, African American Students*

Unlike the previous demographic model, this model, with all variables included, demonstrated a goodness of fit by both the Omnibus Tests of Coefficients (Chi-square = 27.438, df = 11, p = .004) and the Hosmer and Lemeshow Test (Chi-square = 5.302, df = 8, p = .725). This model also explained an extraordinary amount of the variation based on the pseudo R square values Cox & Snell = 43.5% and Nagelkerke = 58.2%. This model correctly predicted 83.3% of the cases.

With all variables entered in the model, two factors are worthy of attention as predictors of graduation. While participation in the Educational Opportunity Program is not statistically significant as a predictor of graduation, EOP approaches significance (p = .056) and therefore may be worthy of further examination. This may be due to a small number of students in the study and an even smaller number who participated in the EOP program. The qualitative portion of this study (discussed later), also supports further exploration of the role of EOP in student graduation. The only statistically significant factor, however, was living on campus. Consequently, living on campus during their first year of college increased the odds

of these students graduating by a factor of 130.472, all other factors being equal. Again, the small sample size may account for this unusual result and warrants further exploration. Table 12 provides a detailed look at the results of this model.

Table 12:

Logistic Regression Predicting Graduation, All Variables,

Low Eligibility Index Cohort, African American Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Participation in EOP | 2.576 | 1.348 | 3.651 | 1 | .056 | 13.150 | .936 | 184.785 |
| Lived on Campus | 4.871 | 1.949 | 6.249 | 1 | .012 | 130.472 | 2.864 | 5944.841 |
| Constant | -20.447 | 11.450 | 3.189 | 1 | .074 | .000 | | |

*Low Eligibility Index Admissions Cohort, Hispanic Students*

The second logistic regression with all variables in the model examined the predictors of graduation for the low eligibility index admissions cohort's Hispanic students. This model successfully predicted 69.3% of the cases according to the classification table. This model also accounts for a significant amount of variation in the graduation rates according to the Cox & Snell (17.7%) and Nagelkerke (23.9%) pseudo R square values. The Omnibus Tests of Model Coefficients (Chi-square = 34.970, df = 11, p = .000) and the Hosmer and Lemeshow Test (Chi-square = 12.763, df = 8, p = .120) indicate the model's goodness of fit.

This model revealed four different predictors of graduation, which span all three categories, demographic, high school factors and campus related factors. First,

one demographic factor was identified as a predictor for success. For each unit increase in parental income, the odds of graduating in six years increased by a factor of 1.373. Two high school related factors were significant. For every increase in the units of advanced placement credit, the student graduation odds increased by a factor of 1.099. High school grade point average was also a predictor of graduation. For every unit increase in high school grade point average, the odds of graduating increased by a factor of 10.543. Finally, the odds for those students who enrolled in the university seminar course during their first year increased by a factor of 2.303. Table 13 illustrates the specifics for these predictors.

Table 13:

Logistic Regression Predicting Graduation, All Variables,

Low Eligibility Index Cohort, Hispanic Students

| | B | S.E. | Wald | Df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Family Income | .317 | .137 | 5.383 | 1 | .020 | 1.373 | 1.050 | 1.795 |
| Advanced Placement | .094 | .042 | 4.958 | 1 | .026 | 1.099 | 1.011 | 1.194 |
| High School Grade Pt. Aver. | 2.356 | 1.013 | 5.405 | 1 | .020 | 10.543 | 1.447 | 76.803 |
| University Seminar Class | .834 | .376 | 4.913 | 1 | .027 | 2.303 | 1.101 | 4.814 |
| Constant | -7.311 | 3.839 | 3.627 | 1 | .057 | .001 | | |

*Low Eligibility Index Admissions Cohort, White Students*

The next test was the logistic regression model including all variables related to the White students admitted to the university under the lower eligibility index. This model was supported by both goodness of fit tests; Omnibus Tests of Model Coefficients (Chi-square = 6.934, df = 11, p = .005) and the Hosmer and Lemeshow Test (Chi-square = 7.013, df = 8, p = .535). According to the classification table, the model correctly predicted 66.7% of the cases. The model accounts for approximately 13.5% to 18% of the variation in graduation rates as noted by the pseudo R square values (Cox & Snell and Nagelkerke respectively).

Unlike the previous models, this model only revealed one statistically significant predictor of graduation for the low eligibility index admissions cohort's White students. As demonstrated in Table14, the only predictor was math ability. The odds of these students graduating increased by a factor of 3.18 if they did not require remediation in math when they arrived at the university.

Table 14:

Logistic Regression Predicting Graduation, All Variables,

Low Eligibility Index Cohort, White Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Math Remediation Not Required | 1.157 | .418 | 7.650 | 1 | .006 | 3.182 | 1.401 | 7.225 |
| Constant | 3.606 | 4.945 | .532 | 1 | .466 | 36.823 | | |

*High Eligibility Index, African American Students*

The logistic regression model including all of the variables was then retested on the data for each sub population of students (African American, Hispanic, White) entering the university in fall 2001 under the high eligibility index admissions criteria. The first test of this model was of the African American student data for this admissions cohort. While this model did not demonstrate goodness of fit using the Omnibus Tests of Model Coefficients (Chi-square 6.846, df = 11, p = .811) it did demonstrate goodness of fit by the Hosmer and Lemeshow Test (Chi-square = 9.794, df = 8, p = .280). This model explains approximately 8.6% - 11.6% of the variation in graduation rates as estimated by the Cox & Snell and Nagelkerke pseudo R square values. The classification table indicated that this model correctly predicted 76.7% of graduates. However, this model did not identify any statistically significant predictors of graduation.

*High Eligibility Index, Hispanic Students*

The logistic regression model using all variables for the high eligibility index admission cohort's Hispanic students did not demonstrate goodness of fit on the Omnibus Tests of Coefficients (Chi-square = 17.571, df = 11, p = .092). This model did however, demonstrate goodness of fit using the Hosmer and Lemeshow Test (Chi-square = 13.281, df = 8, p = .103). According to the classification table, the model correctly predicted 80.6% of the graduates. The amount of variation in graduation rates by this model estimated by the Cox & Snell and Nagelkerke pseudo R square values is between 4.6% and 6.2%.

This model identified one predictor of graduation for this cohort of students. As demonstrated in Table15, the high eligibility index admissions cohort of Hispanic students' odds of graduating increased by a factor of 3.112 for each unit increase in high school grade point average.

Table 15:

Logistic Regression Predicting Graduation, All Variables,

High Eligibility Index Cohort, Hispanic Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| High School Grade Pt. Aver. | 1.135 | .486 | 5.468 | 1 | .019 | 3.112 | 1.202 | 8.061 |
| Constant | -4.658 | 2.227 | 4.377 | 1 | .036 | .009 | | |

*High Eligibility Index Admissions Cohort, White Students*

The final logistic regression model included all variables of data for the White students in the high eligibility admissions cohort. This model demonstrated goodness of fit through both the Omnibus Tests of Model Coefficients (Chi-square = 44.570, df = 11, p = .000) and the Hosmer and Lemeshow Test (Chi-square = 8.173, df = 8, p = .417). The model summary table indicated that 91.7% of the graduates were correctly predicted using this model. Additionally, according to the Cox & Snell and Nagelkerke pseudo R square values, the model explains approximately 4.0%-5.5% of the variation in graduation rates.

The model identified one demographic variable, one high school related variable and one campus related variable as statistically significant predictors of

graduation for this particular cohort of students as noted in Table16. Specifically, for each unit increase in the family income, the odds of a student graduating increased by a factor of 1.096. With regards to the high school variable, for each one unit increase in high school grade point average, the graduation odds increased by a factor of 1.762. Finally, for those students who lived on campus their first year, the odds of graduating increased by a factor of 1.661. It is important to note the variety of predictors for the various groups of students within each of the admissions cohorts. A discussion of this occurs in Chapter 5.

Table 16:

Logistic Regression Predicting Graduation, All Variables,

High Eligibility Index Cohort, White Students

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I. for EXP (B) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Family Income | .092 | .044 | 4.412 | 1 | .036 | 1.096 | 1.006 | 1.194 |
| High School Grade Pt. Aver. | .567 | .246 | 5.318 | 1 | .021 | 1.762 | 1.089 | 2.852 |
| Lived on Campus | .508 | .133 | 14.607 | 1 | .000 | 1.661 | 1.281 | 2.155 |
| Constant | -1.509 | 1.185 | 1.621 | 1 | .203 | .221 | | |

## Fifth Research Question

*Research Question 5: Which group of factors (demographic, high school preparation, or college related) accounts for the greatest variation in graduation rates?*

Unlike multiple regression analysis, logistic regression does not provide true R squared statistics, therefore we must rely on the pseudo R square values: Cox & Snell and Nagelkerke (Pallant, 2005). Several different logistic regression analyses determined the amount of variation in graduation rates accounted for by these different groups of variables. This included an analysis for each of the various possibilities: the entire group of students, all students in both of the distinct admissions criteria cohorts, each of the ethnicities within each of these cohorts, and finally each of the ethnicities as a group, regardless of admissions cohort. Table17 lists the Cox & Snell and Nagelkerke pseudo R square values for each logistic regression analysis.

For the entire cohort of students, high school related variables accounted for the greatest variation in graduation rates, although, they still account for a mere 3.5 % (Cox & Snell) to 4.7 % (Nagelkerke) of the variation. For the students from the Lower Eligibility Index Admissions Cohort, all three groups of factors predict more variation in graduation rates than the matched groups of factors for the High Eligibility Index Cohort. The Cox & Snell and Nagelkerke pseudo R square values for the Low Eligibility Index Admissions Cohort were demographic (.017, .023), high school related variables (.061, .081) and campus related variables (.044, .059). This indicates that the high school related variables account for greatest variation of graduation rates followed by the campus related and demographic variables. Specifically, the Cox & Snell and Nagelkerke pseudo R square values for the high eligibility index admissions cohort were as follows: demographic (.005, .007), high school related variables (.015, .020) and campus related variables (.015, .020). This

indicates that we cannot attribute more than approximately 2% of the variation in graduation rates to any of these groups of factors.

Finally, if we examine the variation in graduation rates of students grouped by ethnicity, we find that campus related factors account for the greatest variation in graduation rates for the African American students. In contrast, high school related variables account for the greatest variation in graduation rates for both Hispanic and White students. Looking more closely at the results by individual ethnicity, the Cox & Snell and Nagelkerke pseudo R square values for the African American students were demographic (.003, .004), high school related variables (.028, .038) and campus related variables (.095, .127). The same pseudo R square values for the Hispanic cohort were demographic (.010, .013), high school related (.068, .091) and campus related variables (.028, .037). Finally, the Cox & Snell and Nagelkerke pseudo R square values for the White students were demographic (.008, .011), high school related variables (.025, .034) and campus related factors (.014, .019).

Table 17:

Variation in Graduation Rates as accounted for by Demographic, High School and Campus Related Variables

| | Demographic Variables | | High School Related Variables | | Campus Related Variables | |
|---|---|---|---|---|---|---|
| | Cox & Snell | Nagelkerke | Cox & Snell | Nagelkerke | Cox & Snell | Nagelkerke |
| All | .012 | .016 | .035 | .047 | .023 | .030 |
| Students | | | | | | |
| LEI –All | .017 | .023 | .061 | .081 | .044 | .059 |
| LEI – AA | .042 | .056 | X | X | .188 | .251 |
| LEI – H | .052 | .071 | .097 | .131 | .044 | .059 |
| LEI-W | .041 | .055 | .057 | .077 | .033 | .044 |
| HEI – All | .005 | .007 | .015 | .020 | .015 | .020 |
| HEI – AA | .012 | .016 | .012 | .020 | .044 | .059 |
| HEI – H | .001 | .002 | .027 | .036 | .018 | .025 |
| HEI – W | .008 | .011 | .015 | .020 | .012 | .017 |
| All AA | .003 | .004 | .028 | .038 | .095 | .127 |
| All H | .010 | .013 | .068 | .091 | .028 | .037 |
| All W | .008 | .011 | .025 | .034 | .014 | .019 |

X = model did not demonstrate goodness of fit through either the Omnibus Model Tests of Coefficients or the Hosmer and Lemeshow Test.
LEI = Low Eligibility Index, HEI = High Eligibility Index, AA = African American, H = Hispanic, W = White.

## Sixth Research Question

*Research Question 6: How do graduates who entered the university in the fall 2001 semester with lower eligibility indices, describe their personal, as well as the university's supports in aid of their graduation?*

Individual interviews delved into the experiences of eight students from the lower eligibility index cohort admitted in the fall of 2001, who participated in graduation in spring 2007. The interview cohort included one African American male "Junior," one African American female, "Rain," three Hispanic males: "Sebastian," "Franky" and "Troy," one Hispanic female, "Yessenia," one White female "Natasha" and one White male "Mike." Each of the students answered six basic questions (Appendix D), followed by probing follow-up questions as necessary.

Three primary themes arose related to students' personal and campus support systems. The three primary themes include parental support, engagement, and advisement. In addition, self-determination and resilience are two themes that emerged related to students' personal characteristics. Finally, students described the importance of aligning passions and abilities with a major. Descriptions of the various themes are below. Infused within the descriptions of these themes are quotes from the students to provide a rich understanding of their college experiences.

### *Parental Support*

Each of the eight participants mentioned their parents as their primary support system outside of the university. The students spoke with passion and conviction about the types of support their parents and other family members

provided them. Some of the students mentioned financial support, but that was secondary to the emotional support and encouragement of their progress. For example, Mike stated:

> [My parents supported me] just by constantly keeping me positive; especially when you realize that after about three years that you still have a great deal of time left.…They were the ones who were footing the bill the entire time and they never really, I mean they did get on me about it, but at the same time it was more of a positive thing.

Sebastian and Yessenia mentioned the financial support their parents provided. Their comments acknowledged emotional support more significantly than financial support, however. Sebastian stated, "My mom's my mentor, I talk to her about anything. Every time there is a decision to be made, I ask her." Yessenia commented, "…they've always been there for me, pushing me in a way, not to give up even when it's hard."

The emotional support parents provided spanned both first-generation students, and students whose parents attended college. The comments particularly from the first-generation college students acknowledged the struggles of their parents and other family members. Natasha mentioned that although her parents did not go to college, over the years she has heard them state that if they had it to do over again; they would definitely continue their education. Rain stated, "Even though [my mom] didn't go to college or graduated from high school, she was there as a support system for me. So she wouldn't really understand, but she would try to advise me in some way." Troy recognized the struggles of his parents, and their continued support for him, stating:

> …coming from a Mexican-American family and being first-generation and hearing all of the struggles and their survival stories, you know I feel a lot of pressure to go to college, which was essentially good pressure since there is definitely nothing wrong with getting a higher education. So you know, I just received a lot of support from them, both financially and personally, and emotional and mental support as well.

Yessenia's comments were similar, "In general they always believed in me and how I can succeed because I am going to be the first from my family to graduate…" Family support, particularly from parents was the most prominent theme when students described their personal support systems outside of the university that helped them to persist to graduation.

### *Engagement*

The theme of engagement was prominent in the student interviews. Engagement included various forms of connectedness to someone or some organization at the university. Within the theme of engagement, were several pathways through which students seemed to develop social capital at the institution. Chapter 5 further explores the notion of students' acquisition of social capital at the institution. Engagement occurred through relationships developed with faculty, in research programs and through on-campus employment.

#### *Engagement with Faculty*

Several students noted they had developed a close relationship with one or more faculty members. They mentioned how their professors mentored, challenged and supported them. Specifically, Mike mentioned that his major required him to bridge his academic experience with hands-on work. The professors were there to observe the work and motivate him. Mike stated that the professors in his major

"…provided a lot of support and you know, positive reinforcement for what I was doing and they were really the ones who set me on the path, got me interested, got me motivated." Sebastian identified three "outstanding" faculty members who supported his persistence to graduation. He specifically mentioned how one professor challenged him to do his best. Sebastian stated "If you want to think about standards and an expectancy of excellence, I think about Professor G." He later described how that affected his own desire to do his best. Sebastian continued,

> It's like when I am half-assing things for lack of a better term, I think about what would (Professor G) be thinking right now, how would he grade me, what would be his opinion? And if it's not acceptable to him, it's probably not acceptable.

Professors both challenged students with high expectations and supported them when they were in need.

The participants explained how their professors not only supported students' acquisition of knowledge and application of this new knowledge to real life settings; they also supported the students during their personal struggles. Natasha mentioned that once she realized professors were serious about taking advantage of office hours, things were great. She recalled one specific time when she went to Professor V. for an extension on a paper. Working full-time to pay her way through school, she was having a difficult time balancing it all. Natasha stated, "He actually really cared that I had work that I had to do, and he was able to extend [the due date for my paper]."

Rain mentioned her participation in two minority research programs. Most important to her was the professor's willingness to take a risk on her. Rain indicated that she emailed several professors to get involved in their research, but Dr. C. was

the only one to respond to her. This outreach by the professor occurred in a critical time in Rain's educational career. Rain stated,

> She took me in and taught me everything I needed to know about research, and I wouldn't know anything about going on [to graduate school] without her. …Dr. C. found me a job at the time when my fiancé passed away. I had a job, but it was a little too stressful for me at the time and she had connections everywhere. She told me to join a summer internship program. Just things I wouldn't have known as a normal undergraduate student.

Rain's comments provide insight into how connections with faculty members can provide students with the resources defined as social capital.

*Engagement through on-campus employment*

Other students found their connectedness by working on campus. Junior mentioned how the relationships he developed in the office where he worked encouraged him. Perhaps more importantly, however, through his employment he learned how to navigate through the university. Junior described this "When I was a freshman I was hired by my current employer, …basically by being a student assistant I learned a lot about the school, the ins and outs for the most part."

Natasha too, was supported by and through her connection to her on-campus job. Natasha explained that she left campus for a year because she wasn't sure what she wanted to do. She failed to file the official paperwork with the university to indicate that she would be leaving. When Natasha decided to come back to school, it was a woman in the office where she had previously worked who "had a lot of pull on who comes back in." Natasha acknowledged that she was unsure about her chances to return to the university without this connection. For others, connection to

support systems on campus resulted from involvement in student clubs and organizations.

*Engagement through Clubs and Organizations*

Rain mentioned that she joined the African Student Union and a group called "Between My Sistas." Two of the Hispanic males described how their culturally based fraternities positively influenced their persistence to graduation. Not only did the fraternities provide a social outlet, but they also encouraged academic success. Franky elaborated on this point,

> If it wasn't for someone reaching out to me [to encourage me to join the fraternity] I definitely wouldn't be graduating. I wouldn't be here, I know I wouldn't….Our fraternity values brotherhood, you know, but it also values graduating the brotherhood, that's important. I know for me that the fraternity is really like my family here. Fraternities and sororities can kind of be like family, you know? We really look out for each other and care about what happens to other people. We are support systems and friends and help each other out like family members do.

Student connectedness and the sense of social capital was a significant support system for this cohort of students.

*Advisors*

Students described the advice they received from on-campus advisors as another source of support. Interestingly, all eight interviewees mentioned advising as an important institutional support for their persistence to degree. This supports previous research by Habley and McClanahan (2004) which found that academic advising was one of the top three retention practices responsible for the greatest contribution to student retention at 4-year public institutions. Academic advising is

both centralized and decentralized at SDSU. While students are completing their General Education requirements (generally first 60 units of study), they are advised at the Office of Advising and Evaluations. Once students are in their declared major, however, they receive advising from their academic department or college. Some students however, receive advising from special programs, such as the Educational Opportunity Program.

Regardless of where students received advising, they identified it as a support. Some of the more general comments included Mike's statement about the advisor in his academic department "She was an academic advisor and was one of the most helpful people I've ever had. She found all kinds of little ways that I could get around taking certain classes by using other classes." Sebastian made a comment about the advising he received in the academic advising center "I definitely feel helped by the academic counselors here because I had a lot of questions and they helped me…" The comments from the students who had developed a relationship with their advisor were even richer.

Students in the Educational Opportunity Program are assigned one counselor or advisor who works with them throughout their tenure. Students expressed a trust in their counselor, and a relationship of support and encouragement. Yessenia, Franky, Rain, Junior and Troy all participated in the program and mentioned their counselors by name (names are changed within the transcriptions to maintain privacy). After being academically disqualified from the university, Troy went to his counselor for advice. She told me "well, let's try to talk to your professors to see if they can give you a break here and there." Through that, I spoke to all my professors

from the previous semester and I got all but one of them to change my grades and you know, I was allowed to continue here at State. She was very, very, helpful.

Yessenia also mentioned the helpfulness of her counselor. She stated "She gets to know you and she remembers your name and what you are struggling with and asks you about it, like are you getting better at it? You know, she becomes concerned." This sense of advocacy for the student was present in Rain's relationship with her counselors as well. "The pushed me to join different things and to gain leadership skills through those programs." Later she continued this thought "So they were pretty much there to guide me to where I needed to go." She also mentioned how they were available to her for personal support as well.

*Self-Determination*

When students described their personal characteristics that supported their persistence to degree, self-determination emerged as a common theme. This group of students was determined to succeed, to graduate and to become something or someone. They demonstrated significant internal motivation as well. Mike stated, "I just really hate the idea of failing. It's something that I am just, you know, something I learned at a very young age and something that I am very, very afraid of." Troy colorfully demonstrated his determination in the following statement and metaphor. "It's kind of tough for me, because you know through all that I learned to be very dependent on myself or independent I should say. I really learned not to depend on anyone or anything." Later he continued with the following description:

> I picture myself as a miner and he has a pickax and he's trying to chip away at this dam. [The dam] is retaining all of the positive things that he wants in life or that he's going for. But that dam is holding it back,

> you know. And I just see myself as someone who is very persistent with a little pick ax, just chipping away at it slowly but surely and eventually the dam's going to break open and you are going to attain whatever you are fighting for, whatever you're striving for.

Students also mentioned their parents as part of their determination to attain their degree. Sebastian stated, "I mean, it [the college degree] was definitely for myself, but also I think I knew that it would make my parents very happy." Yessenia's comments echoed that sentiment, "I just keep going, especially because of my family."

The self-determination of these graduates helped many of them overcome cultural barriers or obstacles to their success. Family pressures and cultural pressures from friends were two specific areas mentioned. Troy mentioned how his Mexican-American family supported his quest for college as the first member of his family to do so, but when he came to campus he was faced with different struggles. "It was rough on me for the first couple of years, and especially hearing it from my family as well, you know they kind of felt like I deserted them." The physical separation from his close-knit family was also difficult on Troy.

> …but I realized I'm not going to have certain people around me at all times, and certain things like going to the grocery store or going to class by myself surprisingly was very tough on me and through lots of believe it or not emotional and mental suffering, I finally realized that look, this is how life is going to be; you're going to be alone sometimes. You're going to be by yourself at times, I've just got to deal with it. And I pretty much did and I became very persistent, very dedicated toward certain things….I stuck with it and I hustled and bustled from here to there and I achieved my goal through that.

Their personal struggles from cultural environments expanded outside of the family group to the peer group as well.

Both Junior and Yessenia commented on how their determination to rise above expectations allowed them to separate from the pressures they received from their peer groups. These two individuals describe how their will power and determination helped them to overcome pressure from their peers not to pursue higher education and ultimately a college degree. Junior stated,

> Being a young Black male, especially from the neighborhood I'm from, [attending college] is really not expected of you so I always kind of felt like I was a cut above everybody else for the most part….I ran around in high school with a crowd that … a lot of them wouldn't have taken this path, such as going to school and stuff… I'm pretty determined to prove people wrong, because I've been doing that, you know, since I was young. Doing a lot of stuff that isn't expected of me. I'm stubborn, real bullheaded. I guess if there's something that I really want, then I'll really try to achieve that – school is definitely one of those.

Yessenia's comments about overcoming the pressures of her friends in high school were very similar. Yessenia stated,

> I want to be somebody, like because unfortunately the majority of the Latino's don't really proceed into college, you know they always just graduate from high school. Like for instance, most of my friends, they just give up, they're like college is not for me. They just say I'm going to go and get a job. But I'm not going to do that. That's not me, you know, I just want to be somebody. I want to be a professional, not just work at McDonalds or Target, or Wal-Mart or something. I want to do something on my own. I didn't want to be in the footsteps of everybody else. I want to go somewhere else, not just follow everyone because we're Latino. You know, like Latino's don't go to college. But WE DO [caps added] go to college and become somebody else. I'm not just going to stand back and let someone else become something….And even though I went to a [high] school that was not very high privilege I guess, there were a lot of kids, disturbed kids, and I was still able to push myself up, you know.

Yessenia's determination is also an example of the second personal quality that these successful students seemed to have in common, resilience. These findings support

early research by Allen (1999). Allen found that students' desire to finish college affected student persistence, particularly for minority students.

*Resilience*

Many of these students faced a variety of challenges during their collegiate career. These challenges included cultural, family and peer pressures, loss of relationships and academic difficulty. The theme that emerged from this data was that these students were extremely resilient. They were able to rebound from challenges that would likely result in the attrition of less resilient students. Through their voices, we learn more about the trying times they overcame. Mike, Troy and Yessenia mentioned academic struggles. Mike stated, "I even came close to failing, I mean I got a 1.98 freshman semester and was put on academic probation. After that it was, you know kind of nose to the grindstone."

Similarly, Yessenia described her academic struggles:

> I definitely got stressed out about my grades. The classes are not very easy, well not for me. I had to study every day, every day. That definitely was an obstacle for me, because they were not very easy whatsoever. I guess that stress, that's another obstacle, because there was a point that I was about to drop out because I was just so stressed out."

Troy's academic struggles, due in part to the end of a relationship, resulted in his disqualification from the university. Troy recalled,

> Within that [semester] that I did get disqualified I actually had a relationship with a girlfriend of mine that ended on really, really bad terms for me and I was in a depressed state I think for about a year….You know, I guess you have to take every situation with a positive outlook and just kind of keep fighting for your goals.

Rain also experienced the loss of a significant relationship and mentioned how she was able to take this tragedy and positively allow it to influence the direction of her

studies. Rain mentioned that her fiancé's violent death was an influence in her last two years of undergraduate work. Rain stated,

> I started doing research. I wanted to do research in violence prevention. I think he helped me a lot. His memory helped me a lot….I knew I wanted to graduate from college, but it was him, it was his situation that pretty much said, okay. When I get my Ph.D., this is what I want to do.

Students' support from their family, their ability to develop relationships on campus, their self-determination and resilience all contributed to their success. These students also mentioned the importance of aligning passions and abilities with their major.

### *Declaring a Major*

During the interviews, the participants commented about their majors, and/or the importance of declaring a major that was aligned with their passions and abilities. Some described how they found their major while others commented on the advice they would give to an incoming student about how to select a major. Most of the students changed their major once they arrived on campus. Sebastian described how he declared his major in his sophomore year. Sebastian said,

> I was just thinking about what I was going to major in….I didn't want to be a business major, and I hate math and I hate reading and writing about things that don't interest me, and so I was thinking okay, what comes easy to me and what do I actually enjoy? And so the only thing that actually comes easily to me that I enjoy is music, so that's how I chose that.

Junior stated that he would tell an incoming freshman "choose something they are really, really interested in."

Both Yessenia and Mike have siblings following them through SDSU. Yessenia stated that she talked to her sister about the first major she declared. “I was like what are you doing in nursing? You’re very good at talking to people … you should do something that has to do with business or marketing or something because you are good at that.” About declaring her own major Yessenia stated that she wished she learned earlier that “it was something that I like and I enjoy and that I am good at. They [her professors] keep telling me that I am pretty good, so you know, I trust them. I believe what they say.” Mike’s advice to his brother was similar. Mike told him to:

> Do what you enjoy most of the time….When I was going to school I was enjoying what I was doing as opposed to somebody who goes into accounting because they know that when they graduate they will have a $60,000/year job waiting for them. But those years in college I just can’t imagine what it would be like to major in, you know accounting or any of those things. I would just do something you really enjoy.

The majority of the participants mentioned the challenges of finding a major. They stressed the importance of aligning their passions and abilities with their academic studies, and for many of them, this required changing their major from what it was originally.

The participants did not have a difficult time identifying the support systems that helped them persist to graduation. These successful students identified family support and connections at the university as particularly helpful. Furthermore, the students seemed to share personal qualities of determination and resilience. Finally, they identified alignment of their choice of major with their interests and personal strengths.

A discussion of the study's findings described in Chapter 4's findings will occur in Chapter 5. Each of the research questions will be addressed individually, followed by a discussion of the themes that emerged from the research.

from the research.

# CHAPTER 5

## DISCUSSION

San Diego State University has a unique admissions policy. Eighty percent of the students in each freshman class must attain the university's ever increasing admissions standards. The remaining twenty percent of spaces in the incoming freshmen class are reserved for students who meet the less stringent California State University System admissions criterion, but do not meet the SDSU admissions criteria. Understanding the student success rates (measured by persistence to degree) is important for the students, the university, and society. This study examined the differences in graduation rates for three specific ethnicities, African American, Hispanic and White students within the two different admissions cohorts (high eligibility and low eligibility). Furthermore, the study examined the different predictors of graduation for the various ethnic groups and cohorts in the study. Finally, interviews of students provided a lens through which we can understand the success of students who entered the university under the lower admissions criteria, and the support systems they utilized during their tenure on campus.

This chapter provides a discussion of the results of the study. The chapter will address each of the research questions in order. Also discussed are themes that arose throughout the research. Later this chapter outlines implications for practice. A discussion regarding implications for students, the university and the California State University System will follow. The chapter will close with recommendations for future research as well as the limitations of the study.

*Summary of Results*

An intra-institutional achievement gap exists between the students admitted to the university under the high eligibility index and low eligibility index. The students admitted to the university in the lower eligibility index cohort (based on high school grade point average and score on standardized test) graduated at lower rates than their peers from the high eligibility index cohort. The gaps between the achievement of Hispanic and White students in the lower eligibility index cohort and their peers in the higher eligibility index cohort were statistically significant. While the traditional achievement gap was not present between the 6-year graduation rates of Whites (48.5%) and African Americans (49.3%) in the low eligibility index cohort, a gap existed between the Whites and Hispanics (41.8%) in this same cohort. Among students in the high eligibility admissions cohort, White (61.8%) and Hispanic (60.0%) graduation rates were fairly close; however, the African American graduation rate lagged behind (55.1%).

One of the more surprising findings was that African American students outperformed White and Hispanic students admitted in the lower eligibility index cohort. The exclusion of athletes, non-traditional students and other specially admitted students may explain this phenomenon in part. When these specially admitted students were omitted from the sample, the African American lower index cohort was reduced by 27.2%, compared to a reduction of 24% of lower index cohort Hispanics and 21% of lower index cohort Whites. Studies debate the success of student athletes as a cohort. Purdy, Eitzen and Hufnagel (1982) found that athletes achieved less academically than the general student population. More specifically,

another study found that there was a significant achievement gap between White athletes and their African American peers (Gaston-Gayles, 2004). These studies suggest that the removal of athletes from the student population may account, in part for the absence of the traditional achievement gap in graduation rates.

As the institution's admission process becomes more competitive or more selective for 80% of the incoming freshmen class, it is important to examine the effects of the distinction in the admissions cohorts. If the eligibility index predicted outcomes, this would require significant further exploration. Hispanic and Whites both demonstrated a statistically significant gap between graduation rates in their low and high eligibility index groups. It is important to note that this does not mean that the eligibility index is predictive of their graduation; rather there are different factors that affect students in these two groups. It is notable that there are students of all three ethnicities who graduate from the lower eligibility index cohort. This warrants exploration of the factors that supported graduation of students with more modest college entrance examination scores and high school grade point averages. This was explored in the following research questions and will be discussed later.

The second research question explored the predictors of graduation for the students admitted under the different cohorts. There were both similarities and differences between the groups. It is important to note that the model for the low eligibility index admissions cohort explained much more of the variation in graduation rates (pseudo R square values 11-14.7%) than the model for the high eligibility index admissions cohort (pseudo R square values 3.8- 5.1%). For both cohorts, high school grade point average, math aptitude (not needing remediation in

math) and living on campus during their first year were statistically significant predictors of graduation. These findings are not surprising and support earlier research by Adelman (2004); Hoffman (2002) and Pascarella & Terenzini (1991), Pike & Saupe (2002) regarding high school grade point average; Adelman (2006) regarding math aptitude; and (Astin, 1975, 1977; Chickering, 1974; Pascarella & Terenzini, 1991) and others regarding on-campus residency.

The differences in graduation predictors between the two eligibility cohorts warrant further discussion. For the low eligibility index cohort, earning college credit through advanced placement courses during high school was a significant predictor of graduation. This supports the notion that the academic rigor of the high school curriculum makes a difference (Adelman, 1999; Warburton, Bugarin, & Nunez, 2001). Enrolling in a university seminar course was also a statistically significant predictor of graduation for the lower eligibility admissions cohort. This is supported through previous research by National Survey of Student Engagement (2005). The difference in the university seminar course' significance with the low eligibility index student but not the high eligibility index students is an area for further exploration.

The significance of the university seminar course may be associated with the notion of social capital, to be discussed later. The percentage of low eligibility index cohort students who were first-generation college students (27.4%) was more than twice the percentage among their high eligibility index cohort peers (13.3%). For first-generation college students, and students with lower levels of academic preparation in high school (as measured by their SAT and high school GPA and used

to calculate the eligibility index formula), this course may be particularly useful. This course introduces students to the university in a small classroom setting (12-15 students to one faculty or staff member). It may guide first-generation students in traversing the university's bureaucracy, help them learn study skills, and introduce them to campus resources. Parents who did not attend college may not be able to assist their students in these three areas.

Another interesting finding that distinguished the predictors of these two distinct admissions groups was family income. For the high eligibility index cohort, family income was a predictor of graduation. However, for every unit increase in family income, the odds of graduating only increased by a factor of 1.075. While this was statistically significant, it is important to note that the odds of graduating did not increase dramatically, nor did the model as a whole explain much of the variation between those who graduated and those who did not (pseudo R square values 3.8%-5.1%).

The third research question asked whether the variables associated with academic preparation were the most predictive for all three ethnic groups within the two different admissions cohorts. All available data regarding academic preparation was included in the analysis. These variables included high school grade point average, score on the SAT, number of college credits earned through advanced placement courses, and math and writing aptitude as measured by whether or not the student was required to complete remedial work in these areas upon entering the university. A formula combining high school grade point average and score on the SAT determines the eligibility index of applicants for admission. Should the

university (and the greater California State University System) use these two variables to ascertain whether an applicant is likely to succeed?

When we examine the logistic regression output for both the low and high eligibility cohorts, two themes emerge. High school grade point average and the absence of need for remediation in mathematics were predictors for success for students in both of these admissions cohorts. In attempting to examine the predictors of success for each of the three ethnic groups within these cohorts, however, the model did not demonstrate goodness of fit for African American students in the low eligibility cohort. In addition, for the African American students in the high eligibility cohort, none of the high school related factors arose as a predictor of graduation. For the Hispanic populations within the distinct admissions cohorts, the high school grade point average and math aptitude were significant predictors.

Most unusual, however, were the results for the White students in these two cohorts. For White students in the lower eligibility cohort, the only predictor was math aptitude. High school grade point average, unlike the other models, did not demonstrate significance as a predictor. In contrast, however, for the White students from the high eligibility index admissions cohort, score on the SAT emerged as a statistically significant predictor of graduation as well as high school grade point average and not requiring math remediation. This is the only group where the score on this standardized test was predictive of graduation. Oddly, the relationship of the predictor was negative, although the effects likely negligible. The White students in the high eligibility index cohort were slightly less likely to graduate if they had higher SAT scores. This supports the previously examined notion that standardized

tests may not reliably measure the predictive success of all college students (Moffat, 1993; Nettles et al., 2003).

The focus of the fourth research question was an examination of predictors of graduation for African American, Hispanic and White students admitted under each of the two different admissions criteria. Similar to the analysis conducted for the third research question, binary logistic regression models determined the predictors of graduation for each of the three ethnicities within these two admissions cohorts. The differences between the predictors of both admissions cohorts for each of the ethnicities is worthy of further exploration.

First, for African American students from the low eligibility index admissions cohort, living on campus was statistically significant in predicting graduation. Most surprising, however is the degree of significance. Students in this group who lived on campus their first year increased their odds of graduating by a factor of 130.472. This certainly warrants further future exploration. While the positive effects of living on campus are well documented (Astin, 1975, 1977; Chickering, 1974; Pascarella & Terenzini, 1991) the effects for different ethnicities is not well documented. Again, the small sample size for this group may influence these unusual results and may explain why the Educational Opportunity Program approached, but did not reach statistical significance. Interviews with students from this cohort however, indicated that the EOP program did support their retention to graduation. In contrast, the model using the data from African American students in the higher eligibility cohort did not yield any statistically significant predictors of

their graduation. This supports the notion that other factors besides those maintained in the university's database may account for variation in graduation rates.

The most interesting differences may be between the Hispanic students in each admissions cohort and the White students in each of the two different admissions groups. For Hispanic students from the low eligibility admissions cohort, some demographic, high school preparation and college factors were statistically significant. Specifically, family income, high school grade point average, advanced placement credits as well as enrolling in a university seminar course were predictors of graduation. Compare this to the results for the Hispanic students from the high eligibility index which identified only high school grade point average as a statistically significant predictor of graduation. These results support the conversations around the affects of affluence on high school curriculum rigor. In fact, Obrien and Zudak (1998) found a relationship between segregated communities, inferior resources and inferior educational results for non-White students. The relationship between higher family income and opportunities to take a rigorous high school curriculum as well as earn credits in advanced placement courses is worth future examination.

Contrary to the Hispanic student predictors for graduation, for the White cohort of students from the low eligibility index admissions cohort, only one predictor was significant, and three predictors of graduation were significant for the higher eligibility admissions cohort. Math aptitude was the predictor for graduation for students from the low eligibility admissions cohort. For students who did not need math remediation, the odds of graduating increased by a factor of 3.182. In fact,

according to the pseudo R square values, this predictor explained between 13.5% and 18% of the variation in graduation rates for this group of students. For White students from the higher eligibility index admissions cohort, however, family income, high school grade point average and living on campus during freshman year are statistically significant predictors of graduation. These predictors, however, account for only 4.0-5.5% of the variation in graduation rates.

The fifth research question asked which set of variables, demographic, high school, or campus related variables accounted for the greatest variation in graduation rates. The most promising finding derived from this research question is that the demographic variables accounted for less variation in graduation rates than either high school variables, campus related variables, or both in every analysis. Students cannot change their family circumstance, their family income, parental education level, etc. They can strive however, to attend high schools with rigorous curriculum, work to achieve higher grades in high school, and choose to participate in support programs on campus. One area in need of further exploration is the opportunity for students from little financial means to live on campus. This was significant for some populations with the lower eligibility index. If these students are from the local service area, living on campus for them is probably an unlikely choice.

Qualitative inquiry provided the methodology for the sixth and final research question. Eight students who entered the university in the fall of 2001 in the low eligibility admissions cohort, who graduated in spring 2007, were interviewed. These participants described systems that encouraged their persistence to degree. The students unanimously mentioned parental encouragement and support as the

primary personal support system. The importance of family support in the success of students is well documented, particularly for underserved populations (Gutierrez, 2000; Tierney, Corwin, & Colyar, 2004) and to some degree may be able to overcome some negative effects of poverty (Chrispeels & Rivero, 2001). Chrispeels and Rivero suggest this may be particularly important for Latino families. This supports the findings of this study where family income proved to be a predictor only for Hispanic students from the low eligibility index admissions cohort and the White students from the high eligibility index admissions cohort.

Interestingly these findings, related to the importance of ties to the family and parental support, are contrary to Tinto's (1993) theory of student departure. Tinto asserts that students must depart from or break away from past associations to become engaged in the university. In contrast, these students needed their familial support to encourage their persistence to graduation. Several critics have challenged Tinto's notion, stating that this theory may not be applicable to minority students who come from a more collectivist rather than individualist culture (Guiffrida, 2005; Hurtado, 1997; Tierney, 1999). The findings of this study suggest that rather than breaking away from the family, students must learn to balance parental support and cultural pressures while engaging in the life of the campus.

Engagement in the university also proved to support student success. The positive effects of engagement on student success are well noted. These include studies that support interactions with faculty as an educationally effective practice (Astin, 1977, 1985, 1993; Pascarella, 1985; Pascarella & Terenzini, 1991, 2005;

Tinto, 1993). Some of the participants were also engaged in the university through a peer support system established through clubs or organizations.

The choice of one's peer group affects what students do while in college and how they describe their experiences (Kuh, 1993). In addition, Astin (1993) writes that peers are an incredibly strong source of influence; affecting nearly every aspect of the student's development. Although student involvement with peers is important, there is significant research that demonstrates varied and sometimes negative results regarding student involvement in fraternities and sororities and educational outcomes (Astin, 1993; Blimling, 1989; Pike & Askew, 1990). Hurtado and Carter (1997) explored this issue further and found that Latinos who belonged to fraternities and sororities had a higher sense of belonging, as did students who were members of cultural organizations. Hurtado and Carther's (1997) study did not clarify, however, whether the Greek organizations were in fact culturally based fraternities and sororities. The Hispanic participants in this study specifically mentioned their culturally based fraternity as a support of their success.

The forms of engagement the students described, as well as their interactions with advisors, seemed to provide students with social capital, to be discussed later. Furthermore, student personal characteristics of determination and resiliency emerged as critical to their success. The participants demonstrated a high level of self-determination and resilience. These psychological factors do not stem far from the research of Bean & Eaton (2000) who proposed that self-efficacy, among other psychological qualities influence students' ability to overcome academic and social obstacles. Allen (1999) found that the desire to finish college had a direct affect on

persistence among minority college students. While this finding is not central to any of the research questions, it warrants further exploration in the following sections.

Finally, students identified the importance of aligning their major with their interests and abilities. While this is an area not well explored, it may be reasonable to tie this to student motivation and retention. It is reasonable that students studying subject matter they find uninteresting or beyond their abilities would likely lose motivation.

## *Emergent Themes*

Several principal themes emerged through this research. Each of these themes provides the basis for further discussion below. The first theme is missing pieces of the graduation puzzle. The second theme is social networks or social capital. The third and final theme is student resilience.

### *Missing pieces of the graduation puzzle*

Exploring student departure and persistence are akin to putting together the pieces of a puzzle (Braxton, 2000, Kuh 2001-2002). So, too, is the exploration of predictors of student graduation. Most universities, including SDSU, do not manage data related to students other than basic demographic information. In order to get a better understanding of the predictors for graduation, universities must retain more data, explore new relationships, and continue to conduct both quantitative and qualitative studies. While exploring the reasons for student departure may be valid, understanding the factors that lead students to persist to graduation has merit, particularly factors that promote the success of students who are traditionally underserved and/or academically under-prepared. The information garnered through

such strengths-based inquiries, if shared with junior high school and high school teachers, counselors, administrators, students and their parents may help them prepare for college. In turn, integrating this material into the orientation of new students at the university may help students become more ready for the journey ahead of them.

While there are many missing puzzle pieces, this study clearly identified a few of them. It is critically important for universities and educational leaders to acknowledge that one path does not fit all. This study identified different predictors of graduation for the low eligibility index admissions cohort and the high eligibility index admissions cohort. Furthermore, when compared across ethnic groups, both similarities and differences existed in the predictors of graduation. High school related factors and campus related factors accounted for more of the variation in graduation rates than demographic factors, which are obviously out of the students' control. Overall, among the most prominent predictors of graduation were math aptitude, high school grade point average, enrollment in a university seminar course and living on campus. The qualitative analysis also indicated that parental support and social capital were important, as was student resilience and self-determination.

In the wake of such complexity, it would not be appropriate to mandate quick fixes or to make sweeping and broad generalizations as to what predicts graduation in all cases. Students are individuals with unique backgrounds, experiences and challenges. What is helpful, however, is determining what pieces contribute to this puzzle. Examining predictors of graduation helps educators gain a better understanding of what factors the students may arrive with (or without) that predict

graduation. Furthermore, educational leaders can examine what is working well on their campus and explore ways to enhance predictors or supports of graduation.

*Acquisition of Social Capital*

Several areas of this study point toward the acquisition of social capital as a possible predictor of graduation. Social capital as described by Coleman (1988), is the production of something of value for those who have the resource available. The value of the resource (in this case the network supportive of the students' persistence) is dependent on social organizations. Social capital is described as ongoing, sustainable mutual relationships recognizable by both parties (Bordieu, 1985). Furthermore, with regards to social capital, trustworthiness is required in the social environment, and it is important in the education of youth (Coleman, 1988). The presence of social capital for those who persist to degree is apparent. The participants described their social networks both within their culture, and across the organizational structure of the campus. There is the notion of risk involved here. Students mentioned that early in their academic career they were afraid to talk to faculty, were not interested in pledging a fraternity or joining a research project. Ultimately, the encouragement of family members, peers, advisors and student mentors resulted in their risk taking.

All of these students maintained positive relationships with their parents as well. The fact that some of their parents were single parents, some were married, some immigrants to this country, while others held college degrees did not seem to factor into the importance of the support they received from their families. Troy

mentioned that when he did not come home because he was concentrating on his studies, his siblings would often "get on him" about deserting the family; his parents however, supported him without fail. Social adjustment to campus, particularly for traditionally underserved populations is related to family support networks. If these networks encourage students to develop additional support systems on campus, students may be more likely to attain social capital which may directly affect their retention. As Tierney (1999) notes, these diverse students should not be encouraged to break away from their families, but rather to expand their web of support.

The participants' willingness to take risks resulted in impressive returns on their investments. Consequently, Rain, who indicated that at first she was afraid to talk to faculty members, at the encouragement of a peer mentor emailed several faculty members about getting involved in their research. This risk resulted in the development of several ongoing and supportive relationships with faculty members who "taught her everything she needed to know about research," helped her to find a less stressful job after her fiancé died, explained to her the options of graduate schools, helped her acquire internship opportunities and wrote her letters of recommendation. Rain will be attending a masters' program at Harvard University next fall, an accomplishment that she acknowledges would not have been possible without the relationships she developed on campus. Similarly, Mike stated that his academic counselor knew "all kinds of little ways he could get around taking certain classes." Junior mentioned how he learned the "ins and outs" of the university through his on-campus employment and the support he received in the office where he worked. Franky mentioned his fraternity and how it is a support system for him,

and that the fraternity valued graduating its brothers. Each of these examples describes the benefits the students gained as a result of social capital.

The concept of social capital reinforces the idea of examining the student in a holistic manner. It is not enough to understand what the student brings to campus (i.e. demographics and high school preparation), or how they perform academically and what they get involved in once they enter the university. We must also strive to understand their experiences. When at-risk or under-prepared students are encouraged to develop supportive networks on campus, the result is an opportunity to "bridge social capital" (Putnam, 1995). The acknowledgement of social networks yields an incomplete picture. It is also important to understand the power of social networks to teach students how to navigate the university's bureaucracy, how to continue to pursue their education beyond the baccalaureate, how to take advantage of professors' office hours, how to appeal an academic dismissal, etc. The successful students in this study demonstrated ways in which their ability to develop social capital at the institution assisted in their persistence to degree. Universities must strive to find ways to connect students to this web of support and encourage their self-efficacy and risk taking, even when the environment is foreign and students are unable to receive guidance from home.

Student retention literature has addressed the importance of social networks. Students who develop and maintain networks with faculty, staff, family, and peers during their collegiate tenure are more likely to persist (Astin, 1977, 1993; Kuh et al., 2005; Pascarella & Terenzini, 1991; Tinto, 1975, 1987, 1993). The concept of social capital brings new attention to the clout derived from these social networks.

*Resilience & Self-determination Matter*

Resilience and self-determination were common qualities exhibited by the successful students. The students were internally motivated to do well, to graduate, and to "be somebody." Several of the students mentioned the significance of their efforts in making both their teachers and parents proud. Others mentioned the neighborhoods and high school cultures they left behind in pursuit of a college degree. Some felt challenged by peers about their desire to attain a higher education. Sometimes these students even endured siblings questioning whether they deserted the family.

Resilience is a relatively new term in psychology and is a burgeoning field for research related to college students. Resilience refers to the maintenance of positive adaptation by individuals despite experiences of significant adversity (Luthar, Cicchetti, Becker, 2000). Similarly, Richardson (2002) describes resilience as a driving force that allows a person to grow despite adversity and disruptions. Does resilience, in fact make a difference in student retention and graduation? A recent study by Fassig (2004) found that resilience was a better predictor of the adjustment to college than high school grade point average, SAT and level of life stress. Banyard and Cantor (2004) determined that first-year students who demonstrated a high level of resiliency were more likely to adapt to the college environment than their less resilient peers. The more resilient students also believed that difficult experiences provided opportunities to learn (Banyard & Cantor, 2004). Can resilience overcome lack of familiarity with navigating the campus' bureaucracy, the requirements, processes and procedures, when little guidance is

available from students' familiar support systems? This premise demonstrates hope. Cambell-Sills, Cohan and Stein (2006) found that resilience was shown to moderate the relationship between emotional neglect and participants' current psychiatric symptoms.

The power of resilience is not fully understood, but demonstrates great promise in the area of student retention and persistence. The question then becomes; can resilience be taught? All of the students interviewed in the study indicated the presence of a positive home environment with supportive and even strict parents. Did these parents teach their children self-determination and resilience? While this study will not answer that question, it is important to examine the possibility that resilience may be taught to college students. Two studies reinforce the promise of this area. Fabis (2006) found that students who participated in a personal resiliency training class had a significantly lower state of anxiety than the comparison group. Additionally, a study of a program titled "Bounce Back" at SDSU demonstrated positive results. Using two theories, positive psychology and resilience, students on academic probation learned about their strengths and developed strategies to address their personal struggles. This program demonstrates significant potential (Bounce back helps get students back on track, 2005).

### *Implications for Practice*

The obvious achievement gap at San Diego State University between the two admissions cohorts raises a concern related to social justice. The university's internal dialogue reveals conflict between two different assemblies of people. The first represent those whose primary objective is to increase the university's status as

a research institution. The second group represents those who are compelled to support the university's charter as a regional university, designed to support the educational pursuits of high school graduates who meet the minimum California State University admissions criteria within the local region. This dilemma is an issue of social justice. The institution has an ethical obligation to graduate those students it admits, and one might argue at equal rates regardless of admissions criteria. The institution must demonstrate a commitment to improving the graduation rates of all students, but particularly toward those who are currently graduating at lower rates.

A second implication relates to students' acquisition of math competence. Attaining math ability at an expected level is critical to student success. To address this, the university can explore opportunities to enhance their relationship with middle school and high school math departments, teachers, parents and students to emphasize the importance of math ability for college graduation. Furthermore, the university has a ripe opportunity to reexamine the requirements for math skills acquisition and their practices. If the students will continue to be admitted to the university with remedial math needs, new, or different campus support systems could be explored to help students attain these skills and ultimately improve the graduation rate.

A third implication relates to the admissions policies of the university. The fact that the score on the SAT was not a predictor of success for any students calls into question the California State University System's admissions formula. While it is understood that SAT score is one of two components from which the formula is

derived (high school GPA X 800) + (SAT Score), the degree of its prominence in the formula may need reconsideration.

This study found that the SAT was a poor predictor of graduation for all students. The chancellor's office for the CSU may need to reevaluate the current eligibility index to increase the significance of high school grade point average and decrease the weight of standardized test scores in the assessment of candidates for admission.

In the fall of 2001, as an impacted campus the university decided to reserve the twenty percent of the lower eligibility admissions cohort spaces for the local service area students. The service area refers to a geographic region to include Imperial County and part of San Diego County, specifically students who reside south of Route 56. Again twenty percent of the spaces of the incoming freshman class are reserved for this cohort. For these students, the eligibility index remains stable. While the enrollment management policy may continually raise the eligibility index for students outside of the service area, one-fifth of the students will continue to have lower eligibility indices, reflecting lower levels of academic preparation (measured by high school GPA and score on standardized test) than eighty percent of their peers. An implication of the university's definition of the service area with the freshmen who entered the university in fall 2002 is the need to re-evaluate the predictors for success. The results may have implications for the local high schools as well as the university.

Also important to this conversation is the percent of underserved students who are admitted under the lower eligibility index admissions cohort. If the

university does not make significant attempts to address the needs of this 20% of each incoming class, these decisions may in fact affect 30% of the Hispanic students and nearly 50% of the African American students. Considering the graduation rates of these traditionally underserved populations at SDSU in light of the call for increased transparency with regards to student success rates, this would not be prudent. One area for future exploration might be work with local students prior to their attending SDSU.

If future studies find that the rigor of high school curriculum, high school grade point average, advanced placement course units and math aptitude continue to serve as predictors of graduation for local service area students as they did for the low eligibility index admissions cohort in this study, significant opportunities for partnerships between the local high schools and the university should be explored. One example of a related successful program is the Emerging Scholars Program at University of California, Berkley. The Emerging Scholars Program assists local, disadvantaged high school students acquire math aptitude and learn about the expectations of an academic community. In addition, this program has helped local minority students become socially and academically integrated into a predominantly White campus and excel in freshman math courses (Asera, 2001). The success related to the transferability of this program to another public university within the state of California is worthy of further investigation.

A final implication relates to the type of data the university maintains in its database. The majority of the models accounted for very little variation between the graduates and non-graduates. We can conclude, therefore, that there are many

variables not maintained in the university's existing database that significantly affect graduation rates. Additional information should include participants in different forms of academic support programs, engagement in student organizations (i.e. "Between My Sistas," fraternities, sororities), parental involvement (attendance at orientation, participation in family weekend), student participation in research projects, etc. The university does not currently track the factors noted by the students as important support systems to their graduation.

### *Recommendations for Further Study*

Four primary recommendations for further study would extend the work of this dissertation. These areas include review and possible revision of the California State University (CSU) admissions policy, study of the Educational Opportunity Program, examination of the affect of teaching students resilience as a proactive measure and finally further exploring the notion of social capital to expand on current literature related to student networks. Each of these recommendations will be described briefly.

The first recommendation for further study is an examination of the eligibility index used by the California State University System. Analysis of statewide data is an important factor in this recommendation. The study should review whether or not high school grade point average and scores on the SAT/ACT are true predictors for graduation. This study should include the entire body of graduates from the California State University System, who entered the university system as first time freshmen. Furthermore, this data should be disaggregated by ethnicity. If, similar to this research, the SAT is found not to be a predictor for any groups other than White

students, the formula for admission warrants recalculation in order to ensure a diverse student body representative of the diversity within California.

The second recommendation includes a study of the Educational Opportunity Program. While the study did not find enrollment in this program to be a significant predictor of graduation, many of the students mentioned the tutoring, but more importantly, the support through advisement this program offered as supportive of their graduation. Further study into the ways this program supports students may result in the incorporation of successful tools to other areas of the institution to enhance the retention and graduation of other students.

The third recommendation for further study is in the area of resilience training. If students, particularly those identified as "at risk" enroll their first semester in a course that teaches them resilience techniques, students may be better equipped to address obstacles they face during their tenure at the university. Current programs demonstrate promise in this area, particularly as a reactive measure for students placed on academic probation. Used as a proactive measure this may result in higher graduation rates particularly for students who are first-generation college students and do not have their parent's advice to assist them in navigating unknown university territory. Placing remedial math courses after the resilience based course may also enhance student efficacy and ultimately retention to graduation.

The fourth and final recommendation is to continue to explore the power of social networks. Student retention literature currently describes networks as important, but does not explore the actual affects of these networks in the students' acquisition of social capital. Social capital had a significant affect on the retention

and graduation of the participants in the study. Not only did they describe networks with faculty, staff and peers, they mentioned how these networks resulted in their ability to navigate through areas of the campus that were unfamiliar to them.

In conclusion, in order to close intra-institutional achievement gaps in degree attainment we must first identify and acknowledge that they exist. Once we concede that the gap exists, turning our exploratory models from a deficit perspective to one that is strengths-based provides the institution an opportunity to understand what the students and the campus are doing right. Identifying predictors of graduation is a puzzle, similar to identifying reasons students drop out and persist (Braxton, 2000, Kuh 2001-2002). This study served to examine the predictors of graduation at one large public university.

Revealed through the study were some of the pieces of the puzzle, particularly predictors for graduation for specific admissions cohorts, and students from specific ethnicities within these admissions cohorts. The predictors were different for students dependent upon what admissions cohort and ethnic group to which they belonged. Some similarities did cross most groups including math aptitude, high school grade point average, living on campus and enrolling in a university seminar course. The study also provided for a lens through which the experience of recent graduates is viewed. Participants shared personal and university support systems that aided them in their attainment of degree. Understanding the predictors to graduation and student support systems adds new knowledge to the multifaceted graduation puzzle.

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# APPENDIX A

Letter of Invitation via Email

Dear (Student's First Name),

Congratulations on your graduation! I would like to request your assistance with a research project I am conducting as part of my dissertation. This research project focuses on the graduation of students at public colleges and universities.

I would greatly appreciate the opportunity to interview you for approximately thirty minutes. The interview will be on campus at SDSU, at a time convenient to you. The focus of the interview is on the personal and institutional supports that helped you progress from freshmen year to graduation.

Participation in this research is completely voluntary. If you choose to participate, you will receive $30.00 in cash for your time.

Please let me know if you have any questions. Please call me at [redacted] or respond to this Email by June 1 to schedule the interview.

I look forward to hearing from you soon.

Thank you for your consideration.

Cynthia Avery
Doctoral Candidate, Educational Leadership
SDSU, UCSD, Cal State San Marcos

## APPENDIX B

Invitation to Participate, Follow Up Email

Dear (Student's First Name),

Congratulations on your graduation! I am writing again to request your assistance with a research project I am conducting as part of my dissertation. This research project focuses on the graduation of students at public colleges and universities.

I am seeking a few more participants and would greatly appreciate the opportunity to interview you for approximately thirty minutes. The interview will be on campus at SDSU, at a time convenient to you. The focus of the interview is on the personal and institutional supports that helped you progress from freshmen year to graduation.

Participation in this research is completely voluntary. **If you choose to participate, you will receive $30.00 in cash for your time.**

Please let me know if you have any questions. Please call me at [redacted] or respond to this Email by June 12 to schedule the interview.

I look forward to hearing from you soon.

Thank you for your consideration.

Cynthia Avery
Doctoral Candidate, Educational Leadership
SDSU, UCSD, Cal State San Marcos

**APPENDIX C**

Consent Form









SAN DIEGO STATE UNIVERSITY

## CONSENT TO PARTICIPATE IN RESEARCH

Dear Student/ Recent Alumni:

My name is Cynthia Avery. I am a doctoral student in an Educational Leadership program jointly sponsored by the University of California, San Diego, San Diego State University and California State University, San Marcos. You are invited to participate in a research study. Through this study I hope to learn about student's perceptions of the personal and institutional factors that support their educational success from freshmen year through graduation. I am recruiting African American and Hispanic students who are from the local service area, who entered SDSU as freshmen in 2001, and who graduated in 2006 or who will be graduating in 2007, to participate. My goal is to gain a greater understanding about the support systems that help students in these populations reach graduation. The results will be reported in my dissertation that I will complete as a requirement of my graduate program.

If you agree to participate, I will ask you to spend approximately one hour answering questions in a one on one interview on campus. I will ask you about your experience at SDSU, your personal support systems and the systems at SDSU that helped sustain you through graduation.

Your participation is voluntary. Your decision whether or not to participate will not affect any relationship you have with SDSU. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without penalty. You may choose to skip or not answer specific questions as you so choose.

Your name will not be used in the final report. Only pseudonyms will be used so that you will not be able to be identified. With your permission, I would like to audio tape the interview. You may not participate if you choose not to be recorded. The audiotape will be used for transcription and analysis purposes. The audiotapes will be secured in a locked location only available to the researcher. Please indicate below the uses of these audio tape recordings to which you are willing to consent. This is completely voluntary and up to you.

In any use of the audiotapes, your name will not be identified. You may request to stop the taping at any time or erase any portion of your taped recording.

Please initial on the line next to the statements to which you are giving consent.

1.) The audiotapes can be studied by the research team for use in the research project. ____

2.) The audiotapes can be used for scientific publications. ____

3.) The audiotapes can be reviewed at scientific meetings of scientists interested in the study of student success in college. ____

4.) The audiotapes can be reviewed in classrooms to students. ____

5.) The audiotapes can be reviewed in public presentations to non-scientific groups. ____

6.) The audiotapes can be used on television and radio. ____

You have the right to request that the tape be stopped or erased during the recording.

You will have the opportunity to review the transcript of our conversation and make any necessary changes. I do not foresee any risks to you. You will receive $30 at the end of the interview. If you are interested, I will be happy to share my findings with you.

If you have any questions, please feel free to contact me, Cynthia Avery, at [redacted] or my faculty sponsor Patricia Prado-Olmos at [redacted] pprado@[redacted]. *If you have questions pertaining to your rights as a participant, or would like to report any problems or concerns related to this study, please contact a representative from the SDSU Institutional Review Board at (619) 594-6622 or irb@mail.sdsu.edu, the UCSD Human Research Protection Office for assistance at (858) 455-5050, or CSUSM Institutional Review Board at (760) 750-4029 or irb@csusm.edu.*

Please sign below indicating that you have read the above description and give your consent to participate in this study and for the use of audiotapes as indicated above.

_____ _____

Signature date Witness date

## APPENDIX D

Interview Questions

1. I would like to know about your successful experience at San Diego State. Can you describe two or three personal support systems that encouraged your retention and your persistence to graduation?

2. Similarly, can you describe for me two or three university support systems, programs or offices that encouraged your retention and your persistence to graduation?

3. Looking forward to graduation, can you describe, in as much detail as possible your personal strengths or characteristics that allowed you to persist and graduate from SDSU?

4. Did you get involved in campus life during your years at SDSU? (If so, please describe) for example clubs/organizations, research, employment?

5. Again, looking toward your graduation, if you were asked to give advice to the president of San Diego State University, what two things would you advise him not to change about ways in which the university supports students?

6. If you met a student entering the university this fall who reminded you of yourself when you entered the university, what specific three pieces of advice would you give them that you think might help them make it to graduation?