ABSTRACT

WAGNER, JENNIE M. Social Capital, Climate of Prejudice and Discrimination, Environmental Pull, and Academic and Social Integration as Predictive Factors of 6-Year Completion Rates for Minority Undergraduates in Selective Universities. (Under the direction of Dr. Duane Akroyd.)

The United States has become more ethnically diverse, and this trend is projected to continue. Despite an increase in minority group enrollment on campus in the United States during the last decade, their rates of degree completion are not keeping pace (NCES, 2007). The question that remains to be answered is: What factors are unique to minority students that might affect degree completion?

The conceptual framework for this study is grounded in three areas: Bean Nontraditional Student Attrition model (Bean, 1983, 1990), Cabrera and Nora (1994) Perception of Prejudice and Discrimination, and Coleman's Social Capital theory (Coleman et al., 1982). Each of these three theories has been developed to include factors that might be unique to minority student's' decisions to remain in college and earn a bachelor's degree. For this study, the dependent variable is college student completion defined as graduation from a 4-year college or university in 6 years. The purpose of this study is to examine the relationships among background, academic integration, social integration, environmental pull college factors, perception of prejudice and discrimination factors, and social capital factors and how these impact minority undergraduate student degree completion rates. These factors have been shown to have a positive impact on nonminority degree completion; however, studies involving a large number of minority students from different institutions have been lacking.

The study uses data from the National Longitudinal Survey of Freshmen (NLSF). The NLSF is a stratified random sample of first-time, U.S. citizen or resident alien college

students at 28 highly selective institutions. This study utilized only the data for the minority students—Black (n = 1,051), Asian (n = 951), and Hispanic (n = 915)—for a total of 2,917 students. First, an Exploratory Factor Analysis with a promax rotation was performed to analyze the underlying data factor structure. After the identification of 7 meaningful factors, a Logistic Regression Model analysis was performed for each minority group.

The results of this study demonstrated that social capital in the senior year of high school and/or freshman year of college had a positive impact on 6-year completion rates for the Hispanic, Asian, and Black minority students. Also, attending a private research or liberal arts college had a positive impact on 6-year completion rates for the Hispanic and Black minority students. Last, being a female or having a native-born father had a positive impact of 6-year completion rates for Black minority students. These are very important pieces to the puzzle of why so many minority college students leave college without earning a college degree.

Social Capital, Climate of Prejudice and Discrimination, Environmental Pull, and Academic and Social Integration as Predictive Factors of 6-Year Completion Rates for Minority Undergraduates in Selective Universities

by
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DEDICATION

To my family near and far, who helped me dream and achieve; they are my unending source of social capital.

BIOGRAPHY

Jennie Wagner has made nursing and health care the focus of her career. Her educational background includes a Bachelor of Science Degree in Nursing from East Carolina University and a Master of Science in Business Management from North Carolina State University. She is a nursing instructor at the University of North Carolina at Chapel Hill and the RN Options Program Leader. Jennie's clinical area of expertise is Maternal Newborn, and she has taught at the undergraduate and graduate level. In addition, she is a practicing certified Lactation Consultant, and she has cochaired and serves on the Education Committee at the International Lactation Consultants Association.

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- To Kyle, a fellow student and friend I met along the way
- My colleagues at UNC-Chapel Hill, specifically Carol, Chris, Gail, Kathy, Jennifer, Marcia, and Marianne, and many others who were always there with encouragement and kind words
- To Dr. Akrody my chair for his guidance in completing my dissertation
- To my committee: Dr. Weems, Dr. Figuers, and Dr. Bowles, who gave me so much insight and guidance along the way and served on my committee.

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President Barack Obama (2009) set a new goal for higher education: "By the year 2020, America will once again have the highest proportion of college graduates in the world." (para. 64). In order to achieve this goal, college administrators and policy makers will rely on research into college student degree completion to help guide them in making policy changes. For the past 4 decades, college student departure, and more recently degree completion, has been a main topic of research in higher education (Pascarella & Terenzini, 2005; Tinto, 2006). The early studies of student departure led to a flurry of programs aimed at maintaining college student enrollment during the freshman year (Tinto, 2006). However, there has been a paradigm shift from a short-run perspective of maintaining college student enrollment during the freshman year, to a long-run perspective of obtaining a college degree. The word retention will be used sparingly in this paper because of the ambiguous nature of this term. Retention has been defined as continued student enrollment from one semester to another; freshman to sophomore year and continuous enrollment until graduation (Berger & Lyon, 2005; National Center for Education Statistics [NCES], 2010; Tinto, 2006). For this study, the term college student 'dropout or departure' will be utilized to define a student whose initial goal was to complete a bachelor's degree, but did not complete a degree (Berger & Lyon, 2005; Tinto 1975, 1993). Another underlying assumption about college student departure and completion is these terms can be used interchangeably. Hence, components of departure theory can be utilized to explain college student completion, and vice versa (Bean, 1990).

Despite this focus on understanding factors impacting college student completion, low completion rates for college students continue to perplex college administrators on a national level. Even with universities' and college's rigorous admission policies, and an increase in student support services; each year approximately 25% of the freshman class leaves (Braxton, Brier & Steele, 2007). The United States no longer is the global leader in post-secondary education, although the U.S. ranks 7th in terms of the number of students enrolled ages 18–24, we rank 15th in the number of degrees awarded (American Association of Collegiate Registrars and Admissions Officers, 2009). In addition, many colleges and universities are being held accountable for their ability to maintain student enrollment and assist students in obtaining a bachelor's degree. Many policy makers include graduation rates as key indicators of performance for institution of higher education (Seidman, 2005; Titus, 2004). *U.S. News & Report* and other agencies utilize graduation rates with other factors to compile a national ranking of colleges and universities (Berger & Lyon, 2005). Students and their families use these rankings to compare institutions and to serve as a guide in selecting which college or university to attend. Clearly, the concept of successful completion of a college degree is important to consumers and policy makers alike.

Part of the challenge with the study of college student completion, is the ongoing changes both on and off campus that have occurred during the past several decades. The nation is becoming more ethnically diverse and there are cultural differences unique to each group. In 2005, minorities composed 33% of the U.S. population, by 2020 the percentage of minorities in the U.S. population is expected to reach 39% (NCES, 2007). According to

Berger and Lyon (2005), the more we study and learn about college student completion, "the more we will recognize the complexities involved in helping the diverse array of students succeed in our equally diverse system of higher education" (p. 27). For decades, the United States has been viewed by new immigrants as a land of opportunity and advancement. Part of this American dream has been the chance to work hard and advance by seeking a college education. To facilitate this access to college, U.S. institutions of higher education have implemented policies and programs that have targeted underrepresented minorities.

In 2005, the two largest minority groups were Hispanic (14%), followed by Black (12%); NCES, 2007). From 1980 to 2004, the participation rate in colleges and universities for 18 to 24 year olds increased for White, Black, and Hispanic groups (NCES, 2007). However, although college enrollment for these minority groups has increased, graduation rates continue to lag behind White students (Seidman, 2005). In 2007–2008, the percentage of bachelor degrees awarded by race was 71% White, 9.8% Black, and 7.9% Hispanic (NCES, 2009). Although the Hispanic group is the largest minority group in the United States, it has the lowest rate of adults in the United States for earning a bachelor's degree. This phenomenon in academics has prompted one researcher to question whether we have provided minority groups with "access to a college or just college debt" (Hirsch, 2008, p. 17). There would be a significant economic loss on an individual and societal level for not completing a college degree, especially in this competitive global employment market. Minority students have the most to gain economically by completing a bachelor's degree but are the least likely to graduate (KewalRamani, Gilbertson, & Fox, 2007).

However, there is one minority group that surpasses the White majority in graduation rates: Asian-Pacific Islanders racial-ethnic group. Although they represent only 4% of the adults in the United States, they have the highest percentage of adults in the United States with bachelor's degrees (31%; NCES, 2007). In addition, the Asian group had the highest percentage of foreign-born children of any other racial-ethnic group in the United States in 2005. The high college degree completion rate for Asian-Pacific Islanders is also attributed to close family ties and community networking, but the research is limited in this area because of the relatively small numbers of Asian students enrolled at individual colleges and universities (Yeh, 2002; Yosso, 2005). Further research is needed to compare factors that impact college student completion factors for Asian students compared to other minority groups in the United States, specifically the two largest minority groups: Black and Hispanic. Since Asian students have higher college completion rates than the Black and Hispanic students, a comparison of the factors that have a positive impact on completion for each ethnic group would provide important data for university policy makers.

The study of college student completion is a complex analysis of a fluid and dynamic process. Past studies involving college dropout and degree completion can help guide future research, since there remains much more work to be done. The United States is becoming more ethnically diverse, and the colleges and universities must be prepared to make reforms that will increase the rate of college degree completion for all students, especially Hispanic and Black minority students. The overall percentage of children living in poverty was higher for Black and Hispanic (20% to 30% range), than for White and Asian ethnic groups (each

10%); NCES, 2007). For low-income students, 6-year college completion rates are 26% compared to 46% for high-income students (Engstrom & Tinto, 2007). The importance of a good education was echoed by President Obama in his address to a joint session of Congress: "In a global economy where the most valuable skill you can sell is your knowledge, a good education is no longer just a pathway to opportunity—it is a pre-requisite" (Obama, 2009, p. 1). The United States has a strong and proud heritage of providing a pathway of opportunity for its new immigrant citizens. Therefore, it is critical that additional research is undertaken to identify factors that will support and improve minority student college completion rates.

In addition to the changes in diversity in the United States, there have been significant changes in the academic and social landscape in the United States (Seidman, 2005). It is important to understand how the changes that have taken place in the United States affected college campuses. Because of these changes, it is timely to take a new look at the ongoing problem of college student completion.

Historic View of College Completion: A Changing Society

During the past 20 years, there has been a major change in the academic landscape resulting from the impact of societal forces. In Pascarella and Terenzini's (2005) *How College Affects Students*, the authors noted that many of the college departure and completion research studies done prior to the 1990's were "strongly biased toward 'traditional' White undergraduates" (p. 2), and to some extent this bias still exists in the research base of the 1990's. The comprehensive theoretical college departure models Tinto (1975), Bean and Metzner (1985), and others developed were evaluated between 1970 and 1990, and didn't reflect the numerous changes on campus that have occurred in the past 20 years (Pascarella & Terenzini, 2005). In particular there have been changes in diversity and economics that will be explored in relation to the college student population of the past 2 decades.

Diversity. The first major societal change in the last 20 years has been the diversification of the United States population and the national undergraduate student body. The United States is becoming more ethnically diverse and this trend is projected to increase (Seidman, 2005). For the last 2 decades, the minority population in the United States has grown at a faster rate than the White population (NCES, 2007). In 2008, immigration accounted for more than one third of the annual demographic increase in the United States (Keller & Tillman, 2008). From 1980 to 2005, the resident population in the United States increased from 3.6 million to 12.8 million (260%) for Asian/Pacific Islanders, and from 14.6 million to 42.7 million (192%) for Hispanics (NCES, 2007). Blacks had the slowest growth rate for a minority group, from 26.1 million to 36.3 million (39%), and the White population grew from 180 million to 198 million (10%) from 1980 to 2005. The diversification of the United States population is also mirrored on college campuses across the nation.

From 1991 to 2001, higher education enrollment increased by 11.2% or 1.6 million students (Harvey & Anderson, 2005). During this time, White student enrollment fell by 500,000 students, but minority student enrollment increased dramatically by 1.5 million students or a 51.7% increase. One of the fastest-growing minority categories is race-ethnicity unknown, a category added in 1990 by the National Center for Educational Statistics.

Since the 1990's, larger numbers of ethnic minorities are completing high school and are enrolling in postsecondary education. Although larger numbers of minority students are entering college, they are also leaving without completing a degree at a rate that is higher than nonminorities (Fry, 2002; KewalRamani et al., 2007). From 1976 to 2004, undergraduate college enrollment for all minority groups increased from a national rate of 17% in 1976, to 32% in 2004 (KewalRamani et al., 2007). Despite the progress made in expanding educational opportunity to minority groups, degree completion rates continue to lag for groups historically underrepresented in higher education: Black and Hispanic (Kelly & Prescott, 2007). According to U.S. Census data in 2010, 30.3% of Whites had a bachelor's or higher degree completion, compared to 19.8% of Blacks and 13.9% of Hispanic (U.S. Census Bureau, 2012). There are economic benefits to postsecondary educational attainment for both the individual and society. According to NCES (2007), obtaining a college degree is one indicator of an adult's quality of life, since degree attainment has a positive impact on future earnings and employment.

Economics. The second major societal change has been the trend for an increase in the economic benefits associated with obtaining a bachelor's degree. There is a distinct economic advantage to higher degree completion for all students. The gap in earnings between a high school and college graduate has been increasing significantly throughout the past 30 years (College Board, 2006). Pascarella and Terenzini (2005) estimated that the average net annual earnings premium for a bachelor's degree is 17.5% for men and 27% for women, versus just obtaining a high school diploma. Among economically disadvantaged students, obtaining a college degree has a distinct financial advantage, allowing students to move past the income distribution scale within their generation. For example, students with parents in the bottom fifth of the income scale increase their chance of moving up to the top fifth, from 5% to 19%, by earning a college degree (Haskins & Kemple, 2009).

While addressing the 2008 graduates of Harvard University, the chairman of the Federal Reserve Board, Ben S. Bernake (2008) stated, "In the long term, however, the best way by far to improve economic opportunity and to reduce inequality is to increase the educational attainment and skills of American workers" (para. 23). The economic advantages associated with postsecondary education have an even greater impact on minority groups. The trend since 1970 is that a bachelor's degree has a stronger positive influence for people of color than it has on the earnings of Whites in the United States (Pascarella & Terenzini, 2005). In addition to a direct economic benefit to the individual, there are economic benefits for the society at large. There is a lower rate of unemployment for minority groups, and a result of a higher income levels is an increase in Federal and State tax revenues (Ishitani, 2006; NCES, 2007). The community benefits from a higher degree of activism, including voting and community service involvement (Isthani, 2006; Pascarella & Terenzini, 2005).

Statement of the Problem: Limitations of Prior College Completion Studies

In this competitive and global economy, it is essential that the United States regain its status as having the highest proportion of college graduates in the world. In the past, researchers and policy makers examined ways of preventing college student dropout from freshman to sophomore year. However, the focus has shifted to a longitudinal goal of assisting students to obtain successfully a bachelor's degree. The 2010 White House Budget includes a $2.5 billion fund to partner with state and local governments to improve college completion rates, especially for students from disadvantaged backgrounds (Office of Budget & Management, 2010). The benefits associated with a college education need to be available to all citizens, and referring to the initiative to improve college completion rates, Tinto (2006) stated "it is a journey that has only begun" (p. 13). Although there has been a tremendous amount of research done in the past regarding college dropout, and to a lesser degree college completion, there continues to be a need for additional knowledge to help shape policy reform and development.

Early research. According to the Pascarella and Terenzini (2005), the majority of early college departure studies involved theoretical models by Tinto (1975), Bean (1990), and others, which were evaluated at schools where minority students were underrepresented. Tinto's interactionalist theory looked specifically at the student's experience within the institution and advanced the position that academic and social integration has a positive influence on continued college enrollment (Tinto, 1975, 1993). Later researchers postulated that the concepts behind academic and social integration were not culturally sensitive to minority students who had strong family and community bonds (Rendon, Jaloma, & Nora, 2004; Tierney, 1999). Building upon the work of Tinto (1975), Bean (1990) developed his Nontraditional Student Attrition model that included environmental pull variables that take into account the cultural differences of students (Bean, 1990; Bean & Metzner, 1985;

Cabrera, Castaneda, Nora, & Henstler, 1992; Nora, Cabrera, Hagedorn & Pascarella, 1996; Pascarella & Terenzini, 2005). Subsequent studies of Bean's model regarding continual college enrollment were done with primarily "black students, with only a few studies having been done of Hispanic, Asian American or Native American students" (Bean, 1990 p. 167). There continues to be a gap in the current college completion research utilizing constructs of Bean's model, with a diverse ethnic-racial student sample.

A Titus (2004) study utilized some of Bean's Nontraditional Student Attrition model constructs and sampling was drawn from the 1996–1998 Beginning Postsecondary Student survey. However, since the focus of this study was the effects of the institutional context on persistence, the student level variables were group mean-centered. Titus (2004) concluded that most of the components of Bean's model, including the environmental pull variables, helped explain college student persistence, defined as 3 years of continuous enrollment or graduation at the same university. However, the study did not compare the components of Bean's student model among different ethnic-racial groups. In Titus' study, a positive relationship was demonstrated between hours worked and student persistence, which conflicts with previous research (Pascarella & Terenzini, 2005).

Additional studies by Lund (1989) and Giesler (2007) also utilized constructs of Bean's Nontraditional Student Attrition model. However both of these studies were conducted within a single institution, included older and part-time students and minimal representation of minority groups. Bean's model is well grounded in classic departure theory derived from Tinto (1975), and Tinto's model (1975, 1993) had been researched extensively on majority White students (Pascarella & Terenzini, 2005). Additional research is needed to determine if the environmental pull variables in Bean's model designed to be culturally sensitive, do indeed have a significant effect on minority college student completion rates. Bean and Metzner (2005) recommended that completion theory would benefit from longitudinal research and "future studies should combine data from a variety of institutions" (p. 35). These recommendations are incorporated in this proposed study; hence, constructs of Bean's Nontraditional Student Attrition model will be analyzed utilizing a diverse racial-ethnic student sampling from multiple institutions, throughout a 6-year period. For policy makers, it would valuable to know which components of Bean's model are predictive for college completion, especially for minority groups. By utilizing multiple institutions, a larger number of minority college students can be included in the analysis, versus prior studies with a single institution that includes a relatively small number of minority students in the sample. Prior researchers have questioned whether other factors specific to minority groups could also account for a higher college dropout rate.

Climate of racism and prejudice. The concept of a climate of prejudice on campus began with the work of Fleming (1984) in the mid-1980s regarding cognitive growth and college students. Later, other studies examined the effect of alienation and stress on minority students at primarily predominately White institutions (Cabrera, Nora, Terenzini, Pascarella, & Hagedorn, 1999), or with limited minority groups (S. Hurtado, 1992, 1994). Other researchers reported that a minority student's perception of the racial climate on campus can affect the academic experience and thereby impact the student's adaptation to the university (Chang, 2001; Hughes, Anderson, Harms, Perez, & Moore, 1998).

Subsequently, Cabrera and Nora (1994) developed the Perception of Prejudice and Discrimination scale to assess the prejudice-discriminatory experiences of a student on campus and in the classroom. Later studies of this scale were done utilizing constructs of Bean (1985) and Tinto (1975) at four institutions, but the only minority represented was Black (Cabrera et al., 1999). Cabrera's et al. results did demonstrate that a climate of discrimination and racism on campus did have a small effect on Black student's' decisions to remain in college.

These results were different in a recent longitudinal study that utilized a large group of 8,492 2- and 4-year first-time college students through the NCES. The student characteristics, including degree completion, were evaluated in relationship to the student's perceived racial climate, defined as "the current perceptions and attitudes about the campus environment with regard to race" (Museus, Nichols, & Lambert, 2008, p. 114). In this study, only Hispanic students demonstrated an indirect effect between a higher level of satisfaction with the campus racial climate and degree completion. The differences in these results compared to Cabrera et al. (1999), may result from the operationalization of the construct campus racial climate. The Museus et al. (2008) study measured students' satisfaction with the campus racial climate with a dichotomous variable, compared to Cabrera's (1999) constructs of prejudice and racism encountered on campus and in the classroom. Since the finding of Museus et al. (2008) had some inconsistence with prior studies, the authors advocate additional research, since including more specific measures of prejudice and discrimination may produce different results. According to Museus et al., “Examinations of students from a single racial group appear to be consistent in supporting the idea that campus climates influence student outcomes (Hurtado, 1992; Hurtado, Carter, & Spuler, 1996). However, studies including multiple groups have been inconsistent” (p. 112). In this proposed study, the perception of prejudice and discrimination on campus is evaluated using multiple factors and with Asian, Hispanic, and Black students from 28 different institutions. In addition to a climate of racism and prejudice on campus, researchers have explored additional factors that might also be predictive of minority college student completion. Since Asian students have the highest college completion rate compared to White and other minority students, researchers have questioned whether family and community support defined as Social Capital could be an important factor in predicting college student completion (Seidman, 2005).

Social capital. Based on the theories of Bourdieu (1973), Coleman (1987), and Lin (2001), the concept of social capital and the resulting on- and off-campus networks are theorized to improve the college student completion rates for minority groups. Since there is no universal definition of social capital, the studies have focused on parental, family, and community networks, defined as both on- and off-campus networks. The major tenets of this complex concept are the social structures and networks and their impact on the individual, group, and society.

Earlier college departure studies by Tinto (1975) and others focused on the networking that college students created through close friends on campus, defining this Social Integration. Extending networks beyond one's own social group was necessary to make the successful transition to college and resulted in the student being less likely to leave college, according to Tinto (1993). Although this concept appeared to be relevant to nonminority college students, it was criticized for not being culturally sensitive to minority college students. For minority students attending college, maintaining ties to their family and social community was an expectation of their culture. Severing these social ties would cause additional stress to minority college students that would contribute to departure from college. The researchers reached out to the field of sociology as the focus in college completion studies made the transition to encompass minority students and be culturally relevant.

Bourdieu, in his earlier field work in Kabylia, describes how the reproduction of culture within a society is accomplished by the transfer of social capital (Bourdieu, 1972). Later, Coleman used tenets of Bordieu's social capital theory in his classic study in 1966 on the public school system, *Equality of Educational Opportunity* a report focusing on disparities in public school education (James S. Coleman, 2008). In his study, Coleman observed that students in private high schools were less likely to drop out and more likely to pursue a postsecondary degree. Coleman attributed the support of parents and community members to the difference in academic achievement when controlling for other variables (Coleman, Kilgore, & Hoffer, 1982).

Coleman et al. (1982) describe social capital on two levels: the relationship between the student and his or her family, and the relationship between the student's parents and other adults in the community. Coleman also describes one central property of social networks, which he defines as "closure of social networks" (Coleman, 1988, p. S105). Through these closed networks, sanctions can be applied to other members within the group. However, Lin proposes that searching for or obtaining additional resources requires an open network (Lin, 2001). It has been proposed that deficiencies in the social network for racial and ethnic minority groups could account for the unequal achievement noted in academia and in the work place (Lin, 2000). Despite the different conceptualizations of social capital, there has been support among researchers that family and community support is a key component in the academic success of minority groups.

Regarding college enrollment and parental involvement, the studies have demonstrated a positive relationship for all minority groups (Ceja, 2006; Perna & Titus, 2005). Other studies have validated social capital, defined by parental and community networks, as having a positive effect on Mexican-American college degree completion (M. Hurtado-Ortiz & Gauvain, 2007). In addition, the social networks on campus have a positive influence on Black and Hispanic college students (Cerna, Perez, & Saenz, 2009; Mertz, 2006). Asian college students have the highest rates of college degree completion in the United States (Seidman, 2005). Social capital constructs have been theorized to account for the higher rate of college persistence and degree completion; however, there are limited research studies involving Asian ethnic groups (Moua, 2007; Risner, 2007). There is a gap in the literature regarding social capital in relationship to college degree completion for minority groups (Perna & Titus, 2005; Risner, 2007). Few studies have taken a multi-institutional, multiracial analysis of the impact of social capital in regard to college student completion. Minority college students typically constitute a small percentage of the student body in most colleges. Therefore, it is advantageous to sample from multiple institutions to obtain a sufficient quantity of students from different racial backgrounds from which to make inferences regarding factors that promote college persistence and completion.

College completion studies. When Tinto (1975) first began his research, the focus was on maintaining student enrollment during the freshman year of college. Whereas current policy makers are holding universities accountable for improving college completion rates, especially for minority students. The emphasis is not just access to college but the goal of completing a college degree (Tinto, 2006). Recently, the importance of improving college completion rates has been brought to the forefront of institutions and policy makers on a national basis. President Obama's Fiscal 2010 Budget Overview included a $2.5 million fund to build a federal-state-local partnership to college success and degree completion (American Association of Collegiate Registrars and Admissions Officers, 2009). President Obama, in his address to the joint session of Congress, stated:

> In a global economy where the most valuable skill you can sell is your knowledge, a good education is no longer just a pathway to opportunity—it is a pre-requisite. Right now, three-quarters of the fastest-growing occupations require more than a high school diploma. And yet, just over half of our citizens have that level of education.

> We have one of the highest high school dropout rates of any industrialized nation. And half of the students who begin college never finish. (para. 58)

College completion rates have been stagnant for the past decade, and minority students continue to have the lowest rates of degree attainment (Museus et al., 2008; Seidman, 2005). There has been a mandate from the federal and state level to hold colleges and universities accountable for supporting student success and improving college completion rates.

Recent studies that examined college student completion examined multiple institutions and student background variables (Astin & Oseguera, 2005), and student and institutional variables (Titus, 2006a, 2006b). Other multiinstitutional college completion studies examined factors impacting first-generation college students (Ishitani, 2006), and students attending historically Black universities (Kim & Conrad, 2006) and select institutions (Melguizo, 2008). There is a gap in the research examining college student completion in relationship to constructs of Bean's model (Bean & Metzner, 2005), social capital (Perna & Titus, 2005; Risner, 2007), and a climate of racism and prejudice on campus (Museus et al., 2008). These theoretical constructs are unique because they have been hypothesized to impact college student completion but have not been evaluated with a large group of minority students from multiple institutions (Bean & Metzner, 2005; Museus et al., 2008; Seidman, 2005).

Conceptual Framework

During the past 2 decades, there have been notable changes in the social organization of America. These changes in diversity and economics reviewed earlier are also evident in campus communities (Bowen, Chingos, & McPherson, 2009). These changes on campus necessitate a new perspective in evaluating and analyzing factors that may impact college degree completion. To provide a new paradigm of college completion theory that reflects the current campus environment, a blend of three theories is utilized to provide a conceptual framework for this study. The conceptual framework for this study is grounded in three areas: Bean Nontraditional Student Attrition model (Bean, 1983, 1990), Cabrera and Nora (1994) Perception of Prejudice and Discrimination, and Coleman's Social Capital theory (Coleman et al., 1982). Each of these three theories has been developed to include factors that might be unique to minority student's' decisions to remain in college and earn a bachelor's degree. For this study, college student completion will be defined by the Student Right to Know and Campus Security Act (1990): the percentage of full-time, first-time degree seeking enrolled students that graduate in 6 years, which is 150% of the normal time for completion.

Bean's model. Bean's model was derived from the work of Tinto and an analysis of more than 40 prior studies regarding student completion factors (Bean & Metzner, 1985). Tinto's classic Interactionalist model included a longitudinal dimension that incorporated the background characteristics of the student. Later research studies supported the importance of family background characteristics, such as parents' foreign born, in predicting a student's success in college (Pascarella & Terenzini, 2005; Rendon et al., 2004).

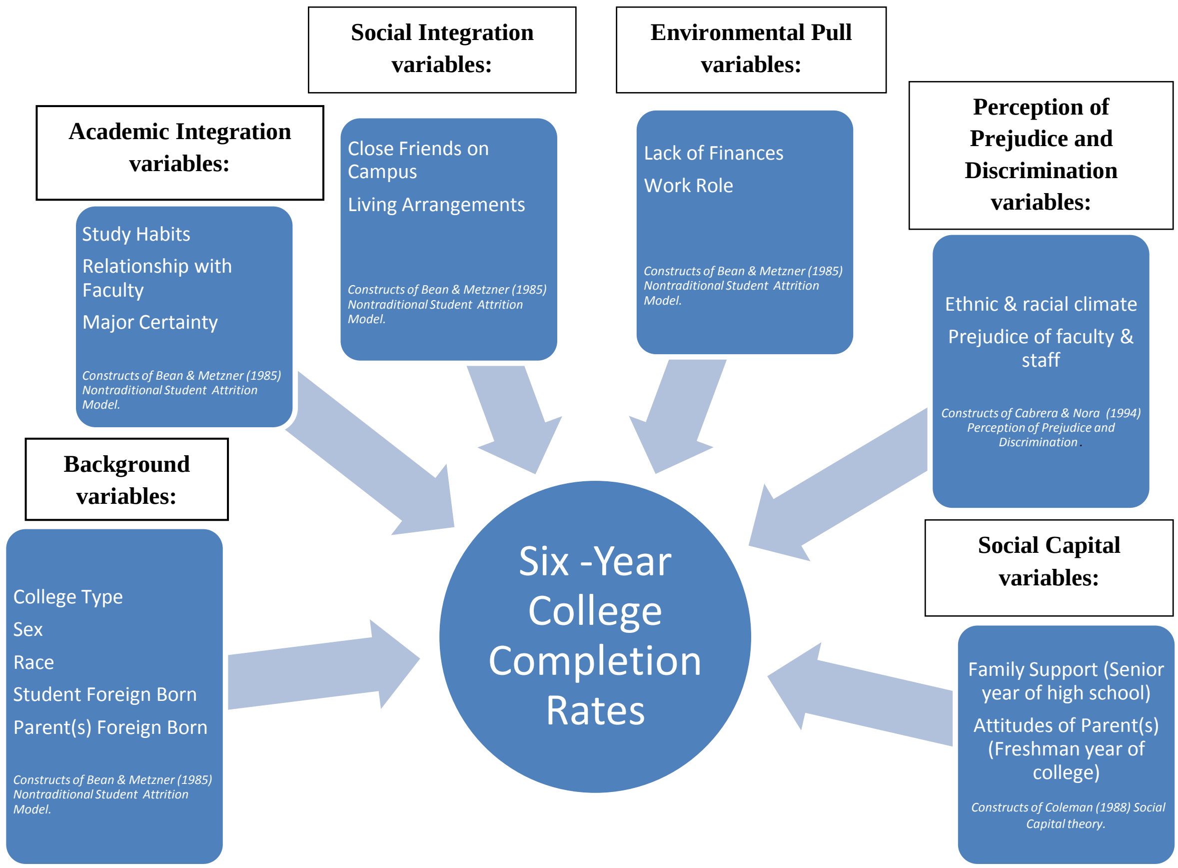

Figure 1. Conceptual model of college student completion

Bean (1990) questioned whether factors external to the campus environment could affect a student's decision to remain in college. These external factors could not be directly controlled by the institution but still impact a student's decision to continue enrollment. In addition, Bean noted that prior research models focused on the traditional student and emphasized the importance of social integration with other members on campus (Bean, 1990; Bean & Metzner, 1985). Bean questioned the definition of a traditional student and concluded nontraditional students were any students who are "distinguished by the lessened intensity and duration of their interaction with the primary agents of socialization (faculty, peers) at the institutions they attend" (Bean & Metzner, 1985, p. 488). Bean contended that social integration for these nontraditional students may not be as important as the social support they receive from family and friends (Bean, 1990). Sociologists define this social network of family and friends as social capital, and have studied the impact this theory has on minority college student enrollment and degree completion. Building upon this concept of external social support, the inclusion of Social Capital Theory was integral to the Conceptual Model of College Completion for this study.

Social capital theory. In Bean's Model, outside encouragement to remain in college was one of the Environmental Pull Factors (Bean & Metzner, 1985). However, this concept of outside encouragement has been deemed especially important to minority students because of cultural norms and beliefs. The support a student receives from parents and family both before and while attending college is a form of social capital, and it has been theorized to have a significant impact on minority student persistence in college (Ceja, 2006; Perna & Titus, 2005). Therefore, in this study the outside encouragement variable that was a component of the Environment Pull factor in Bean's Model is extracted and for this conceptual model is analyzed through the lens of Social Capital Theory. During the past several decades, the concept of social capital has evolved in the field of social science and also crossed into the realm of adult and higher education. Researchers have argued that the academic and social integration components of Tinto's student attrition model were not culturally sensitive (Rendon et al., 2004; Tierney, 1999). It is theorized that minority students come from a culture of tradition and community and that severing family ties is detrimental to the student's success in college (Rendon et al., 2004). In contrast, the support of parents and community members has been attributed to a significant difference in academic achievement when controlling for other variables (Coleman et al., 1982). In research studies involving social capital, this concept is operationalized differently based on the perspective the researcher takes. Social capital can be viewed through the lens of a family, community, or societal phenomenon. For this study, social capital is based on Coleman's work, through the lens of the family involvement and support while in high school and through the freshman year of college.

Cabrera perception of prejudice and discrimination. Building upon the work of Tinto (1975), Bean (1990), and Pascarella and Terenzini (2005), the research team of Cabrera and Nora sought to identify additional factors that could contribute to college student degree completion, especially for minority students. In 1999, Cabrera examined the resulting alienation experienced by minority students on a predominately White campus (Cabrera et al., 1999). It was postulated that minority student's' desire to earn a bachelor's degree was adversely affected by the additional stress of racism and discrimination experienced on campus (Baird, 2004; Rendon et al, 2004). A student's perception of their environment plays a central role in their coping and adaptation efforts (Baird, 2004). Therefore, it is theorized that a campus climate of racism and prejudice can influence a student's' decision to remain in college, especially minority student (Cabrera et al., 1999). Later studies utilized constructs of Cabrera and Nora's Perception of Prejudice and Discrimination, by examining how frequently students have been victims of prejudice and discrimination (Eimer and Pike, 1997), and satisfaction with the campus racial climate (Museus et al., 2008).

A supportive campus environment has beneficial effects for all students, but especially for minority students (Museus et al., 2008; Rankin & Reason, 2005). With an increase in diversity among the college student population, the impact of a climate of racism and prejudice on subsequent minority degree completion is an important research question that must be addressed. By utilizing constructs of Cabrera and Nora's Perception of Prejudice and Discrimination scale, the impact of racism and discrimination experienced both in and out of the classroom can be evaluated in relation to college degree completion for minority students.

Summary

Since Tinto presented his classic model of student departure in the 1970's, there have been significant societal changes in the nation and on college campuses throughout the United States. Changes in diversity and economics have impacted the campus environment, especially during the last 2 decades. Despite previous research studies into college degree completion, there are still many questions that need to be addressed (Pascarella & Terenzini, 2005). Utilizing components of the conceptual framework of Bean's (1990) Nontraditional Student Attrition model, Cabrera and Nora's (1994) Perception of Racism and Prejudice constructs and Coleman's (1988) Social Capital theory provides a theoretical framework for this study that reflects and embraces the cultural diversity of college students.

Purpose of the Study

The United States has become more ethnically diverse, and this trend is projected to continue. Despite an increase in minority group enrollment on campus in the United States during the last decade, their rate of degree completion is not keeping pace (NCES, 2007). The question that remains to be answered is: What factors are unique to minority students that may affect degree completion? The purpose of this study is to examine the relationships among background, academic integration, social integration, environmental pull college factors, perception of prejudice and discrimination factors, and social capital factors and how these impact minority undergraduate student degree completion rates. These factors have been shown to have a positive impact on nonminority degree completion; however, studies involving a large number of minority students from different institutions have been lacking. In addition, what makes this study unique is that the minority students are attending select universities with high admission standards, so academic preparedness and aptitude are not confounding factors in evaluating why students do not complete their education. A 6-year completion rate was selected as defined by the Student Right to Know and Campus Security Act (1990): the percentage of full-time, first-time degree seeking enrolled students that graduate in 6 years, which is 150% of the normal time for completion.

Social Capital and Prejudice and Racism on campus factors are incorporated in this study because these are hypothesized to have an even greater impact on minority college students. Prior college student retention theories either focused on one but not both areas, and the minority student populations were often limited. It is important to acknowledge that cultural differences might exist between minority groups, and researchers should be culturally sensitive to these differences. Students and society benefit from higher numbers of minority students obtaining degrees and becoming role models for future generations.

Significance of the Study

Given the current U.S. economic climate, the need to increase national college graduation rates has never been more important. For the United States, sustained economic recovery will necessitate maintaining a skilled labor force in order for America to remain completive in a global economy. The U.S. Department of Education has requested an increase in the 2013 budget to enhance achievement in education as part of the White House "America Built to Last" initiative (U.S. Department of Education, 2012). Governors seek to improve the quality and education achievements of their workforce to complete with other states and countries for jobs (Schneider & Yin, 2011). The cost of failing to maintain a strong workforce is too great and not optional, according to the current administration.

In 2012, the American Institute for Research reported less than half of all 4-year college students will graduate (Schneider & Yin, 2011). The economic cost associated with this low graduation rate is staggering not only because of lost income to the individual on a micro level, but to the U.S. economy on a macro level. For example, the cost in lost wages and taxes for the incoming fall freshman class of 2002 that did not graduate in 6 years on a national level are for 1 year: $3.8 billion in lost income, $566 million in lost federal income taxes, and $164 million in lost state income taxes (Schneider & Yin, 2011). However, there is more than an economic benefit to the individual and society for college degree completion.

Research has documented an increase in quality of life indicators, such as improved health, community, and civic involvement (Pascarella & Terenzini, 2005). These economic and social costs are even higher for the minority students who don't complete their degrees. In an attempt to increase the number of students who reach their goal of obtaining a college degree, the administration is holding institutions accountable for their student's graduation rates. On January 27, 2012 the White House announced the development of a College Score Card for each postsecondary school with key indicators such as cost and 6-year college completion rates for full-time students (The White House, 2012). The need for additional policy actions on state and institutional levels to improve college graduation rates is needed.

This study hopes to add to the current body of knowledge regarding undergraduate student degree completion theory, and thus provide guidance to university policy makers in developing programs that will assist minority students in achieving their goals of obtaining bachelor's degrees. According to Bean and Metzner (2005), there needs to be additional college completion studies, with students' from a variety of institutions, and this study provides such a research focus. This study will utilize student data from 28 select universities and colleges throughout the United States. A universal measure of the selectivity of a college or university is their acceptance rate. The acceptance rate is the ratio of the number of accepted students by the number of applicants, expressed as a percentage (Hawkins, 2004). In comparing the National Longitudinal Survey of Freshmen (NLSF) colleges and universities acceptance rates to other schools in their region, there is a significant difference (see Table 1). The lower acceptance rate for the NLSF colleges and universities is an indication of a more competitive admission screening process. In addition there was an intentional random, stratified oversampling of minority students in the NLSF study. With this focus on minority students, a comprehensive array of factors will be analyzed that includes traditional college graduation indicators from Bean's (1985) model, such as academic and social integration on campus. In addition other factors unique to minority students will be included: the Perception of Prejudice and Discrimination and Social Capital. This study will the provide valuable insight into the predictive value of the proposed Conceptual Model of College Completion for minority undergraduate students. Additional college completion research focusing on minority college students would assist universities and policy makers in addressing the needs unique to their institutions' minority groups (Bean & Metzner, 2005; Museus et al., 2008; Seidman, 2005). This study's results provide valuable information for policy makers who are held accountable on local, state, and national levels for increasing college completion rates, but in particular minority students.

Table 1

Comparison of Admission Rates for NLSF Versus Other Colleges-Universities by Region

	North	South	Mid-West	West
Average acceptance rate for schools in the NLSF study	31%	45%	54%	21%
Average acceptance rate for school/universities reported by region to the NACAC	65%	69%	64%	44%

Note. Adapted from *The State of College Admissions 2003–2004*, by D. Hawkins, 2004, pp. 32,33. Copyright 2004 by the National Association for College Admission Counseling, Alexandria, VA. Adapted from *The Source of the River*, by D. Massey, C. Charles, G. Lundy, and M. Fisher, 2003, p. 22. Copyright 2003 by Princeton University Press.

Research Questions

Research Question 1: What is the predictive value of background, academic integration, social integration, environmental pull, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Hispanic college students?

Research Question 2: What is the predictive value of background, academic integration, social integration, environmental pull, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Asian college students?

Research Question 3: What is the predictive value of background, academic integration, social integration, environmental pull, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Black college students? Figure 2 represents a conceptual model for this study of college student completion.

Components of College Student Completion Model

The components to the Conceptual Model of College Student Completion are a blend of three different theories related to minority college student completion. The first four factors are constructs of Bean Nontraditional Student Attrition model (Bean, 1983, 1990), specifically the Background variables. Academic and Social Integration and Environmental Pull variables:

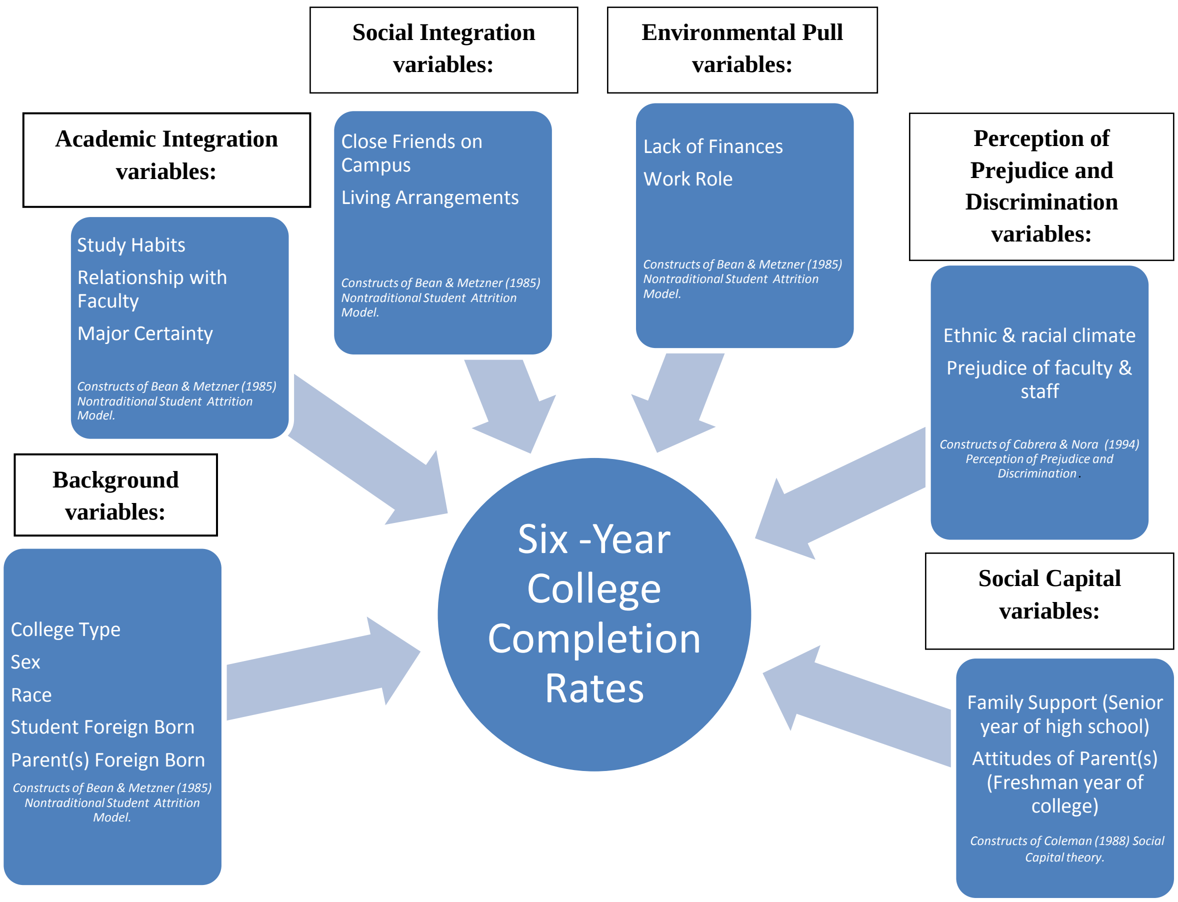

Figure 2. Conceptual model of college student completion

- Background variables: College type, sex, race, student foreign born, parent(s) foreign born.
- Academic integration variables: Study habits, relationship with faculty, major certainty.
- Social integration variables: Close friends on campus and living arrangements.
- Environmental pull variables: Lack of finances and work role.

The second factor, Perception of Prejudice and Discrimination, is a construct of Cabrera and Nora's (1994) Perception of Prejudice and Discrimination theory:

- Perception of prejudice and discrimination variables: Ethnic & racial climate, prejudiced of faculty and staff.

The last factor, Social Capital Theory, is a construct of Coleman's Social Capital theory (Coleman et al., 1982):

- Family support (senior year of high school): Attitudes of parents (freshman year of college).

Definition of Terms

Attrition: is considered to be any student who enrolls at an institution 1 semester but does not enroll the next semester and has not completed his or her formally declared program of study (Bean & Metzner, 1985).

Completion: College completion is defined by the 1990 Student Right to Know and Campus Security Act: the percentage of full-time, first-time degree seeking enrolled students that graduate in 6 years, which is 150% of the normal time for completion (NCES, 1997).

Dropout/Departure: Student whose initial goal was to complete a bachelor's degree but who does not complete it (Berger & Lyon, 2005).

Persistence: Continued enrollment for students, usually Fall to Fall enrollment (Braxton, Brier, & Steele, 2007).

Retention: Continued enrollment at the same institution of higher education until undergraduate degree completion (Berger & Lyon, 2005).

Social Capital: Defined as having two levels: the relationship between the student and his or her family, and the relationship between the student's parents and other adults in the community (Coleman et al., 1982).

Chapter Two: Review of the Literature

The study of college student degree completion has captivated the interest of scholars for the last several decades. Although a tremendous amount of research has been devoted to the topic, there still remain many unanswered questions. With an increase in the diversity of the United States population, college campuses have seen a steady increase in minority student enrollment (Harvey & Anderson, 2005). However, despite this increase in enrollment, minority students leave college without earning a degree at a rate that is higher than White students (Fry, 2002; KewalRamani et al., 2007). Researchers have tried to identify factors that could account for college student departure and especially those that apply specifically to minority students. The evolution of college student departure and completion theory began with Tinto's (1975) landmark study, and has evolved to reflect the diversification of the current college student population.

College Student Departure and Completion Models

Tinto's interactionalist model. In an effort to recruit and retain minority and college students, universities have relied upon the research models to guide their retention programs and policies. In the field of higher education, Tinto's hallmark study was the first longitudinal and interactional model that tried to explain college student departure (Tinto, 1975). Tinto's theory investigated both the academic and social factors that affect a student's decision to leave college (Tinto, 1993). Higher levels of integration, both formally and informally in the academic and social systems of the university, were theorized to lead to a higher level of student commitment to the university. This higher level of commitment to the institution was hypothesized to have a positive effect on degree completion. Tinto's interactionalist model incorporated Van Gennep's (1960) rites of passage to describe the transition a student makes in separating from family and friends as a necessary part of social integration. Students who failed to make this social transition successfully were thought to be more likely to leave college.

Tinto viewed the college campus as a social system "with its own value and social structures" (Tinto, 1975, p. 91). According to Tinto, withdrawal from the campus social system by dropout from higher education was analogous to committing suicide in the wider social system (Tinto, 1975, 1993). It was theorized that students who did not form adequate academic and social integration within the campus environment, would ultimately withdrawal from higher education. This concept of college student dropout behavior was related to the longitudinal interaction between students and their environment on campus.

However, the social integration component of Tinto's Interactionalist model was later questioned since it is based on a framework of assimilation and acculturation (A. Hurtado, 1997; Hurato & Carter, 1997; Rendon et al., 2004). During the time Tinto was developing his model, there was a belief that in order for minorities to become successfully part of (assimilate into) the White-dominate society, they had to make a separation. This separation involved giving up their native traditions, language, and customs to adapt (acculturate) to the dominate culture (A. Hurtado, 1997; Rendon et al., 2004). For minority students, continued support from family and friends is important based on tradition and helps avoid feelings of alienation (Pascarella & Terenzini, 2005; Tierney, 1992). It is noteworthy that during the time Tinto was developing his research model to examine college student dropout, minority presence on campus was minimal compared to the current number of students representing a broader range of ethnic groups (NCES, 2007; Rendon et al., 2004). Later, Tinto (1993) tried to adapt his original theory by referring to student membership versus integration to explain the social component of his model, and adding that a student could be a member of more than one group. By the 1990's, other researchers were developing student departure models that better reflected the changing student ethnic diversity on campus.

Bean's Model. One such researcher, John Bean, built upon Tinto's original research, and developed a Nontraditional Student Attrition model, which included environmental pull variables that take into account the cultural differences among students (Cabrera , Nora, & Castaneda, 1993; Pascarella & Terenzini, 2005). Bean had a different perspective on the phenomenon of student withdrawal from a university. Rather than viewing it as a withdrawal from a social system as Tinto's model, Bean looked at the research into work organizations (Bean, 1983, 1990).

Organization theory. The factors involved with worker turnover in an organization were studied empirically by Price and Mueller in 1981, and these concepts were incorporated into Bean's model of student attrition (Bean, 1983). Price based his original model on an extensive review of the literature and research into worker turnover theories. In Price's causal model of turnover, the factors that impacted an employee's decision to leave voluntarily the organization are defined as employee 'turnover' (Price & Mueller, 1981). Later, Price and Mueller modified the casual model of turnover to include the addition of intent to stay, general training, and kinship responsibility to reflect the work of recent work organization theorist (Bean, 1983; Price & Mueller, 1981). In analyzing turnover from an organization, variables that related to the interaction between the individual and the organization were included, and variables related to the organization environment (Bean, 1983). Bean recognized that in addition to factors at the campus level, that there were factors external to the university that affect a student's decision to remain in school. Thus, Bean incorporated environmental pull factors into his model of college student attrition (Bean, 1985, 1990).

Environmental pull factors. According to Bean (1990), the institution has minimal control over the environmental pull factors; however, these factors greatly influence a student's decision to stay in school. Bean (1990) states, "It is important to recognize that eliminating all attrition is neither possible nor desirable" (p. 164). There are some specific factors that are external to the university that cannot be forecasted or controlled, such as a student's illness or a family crisis. But there are other variables in a student's life that are external to the campus, which can have a major impact on whether a student decides to remain at the university. According to Bean, these external variables should be acknowledged, and research conducted to determine their impact on college student completion rates. The five environmental pull factors proposed by Bean include finances, hours of employment, outside encouragement, family responsibilities, and opportunity to transfer. These environmental factors have been shown to have an even more dramatic effect on minority student graduation rates (Cabrera et al., 1993; Eimer & Pike, 1997).

Finances. The economic downturn of 2009, with record unemployment, and stock market and housing declines has placed an even great burden on students to finance their college education (Cronin & Horton, 2009). According to Callan (2005), president of the National Center of Public Policy and Higher Education:

> The best predictor of what your chances of getting to college, or whether you're going to get there or not, is your family income. And in 25 years in this country, we have not closed the gap in college attendance between the low-, the middle-, and the high-income groups. People don't make it because there aren't the resources to get them adequately prepared; they don't complete high school, they don't take the appropriate curriculum. And many don't make it because they can't afford it; because either they don't have the income, or the financial aid is not available to them, or they don't know how to connect with the financial aid system. (para. 5)

According to the National Center for Public Policy and Higher Education, average college tuition and fees have increased more than 25% during the past 20 years, more than four times the rate of inflation (as cited in Cronin & Horton, 2009). In a 2009 survey of the National Association of College Admission Counselors, 90% of the colleges indicated an increase in student financial aid applications during the past year (Hurley, 2010). For many students, the major source of funding for their college education is through financial aid offered by the university. Pascarella found that much of the research into college student financial aid focused on the decision to attend college; however, fewer studies examined the impact of financial aid on a student's tendency to persist and graduate (Pascarella & Terenzini, 2005).

Students who receive financial aid are less likely to leave college, according to the 1989–1990 National Beginning Postsecondary Student Survey and the 1992 follow-up study.

Hours of employment. With the rising cost of college tuition and fees, many students find their financial aid package is inadequate to fund fully their college expenses, and, therefore, have to work to augment their income. From 1970 to 2000, the percentage of full-time college students who were employed increased from 34% to 52%. In 2007, about 46% of full-time college students were employed, and the number of hours the students worked had increased from the 1990s (NCES, 2009). In addition, the full-time students who were employed worked more hours: in 1970, 10% of students worked 20 to 34 hours compared to 22% in 2007. According to Pascarella and Terenzini (2005), the numbers of hours a student works and degree completion may not be a linear association. For example, Horn and Berktold (1998) found that, controlling for other factors, working 14 or fewer hours per week had a positive effect on persistence compared to working 15 to 33 hours. In addition, there are other studies that suggest on-campus employment may actually enhance student persistence and completion versus off-campus employment (Pascarella & Terenzini, 2005). On-campus employment may increase a student's ability to feel integrated into the academic community versus employment off campus (Horn & Berktold, 1998).

Outside encouragement. The variable outside encouragement is meant to measure the amount of support a student receives from influential people in the student's life who are not employees of the institution (Bean & Metzner, 1985). Perna and Titus (2005) studied the relationship between parent involvement and college enrollment, and discovered, on average, Blacks and Hispanics are disadvantaged in participating in the college enrollment process. The lack of parent support, in the form of social support and lack of resources, suggest, "parents convey norms and standards in ways that promote college enrollment through interactions with the student, the school and other parents" (Perna & Titus, 2005, p. 508). Other researcher findings support the notion that the more informed the parents are about college, the greater the likelihood the student will attend college (Cabrera & La Nasa, 2001; Perez & McDonough, 2008). Parental involvement can be limited by lower socioeconomic status and work schedules. In Perez and McDonough's study, a Georgia teacher in a low-resource school explained, "A lot of parents have a working schedule and it interferes; even though [the financial-aid information session] is offered late at night, we can't get some parents here that may need that information" (p. 575). Recently, researchers have been evaluating the unique attributes a supportive family social structure can have on a student's desire to enroll and complete college (Coleman, 1988; Perna & Titus, 2005; Rowan-Kenan, Bell, & Perna, 2008).

Family responsibilities. One of the biggest obstacles for college students is the management of their time as a key component to college success. It is assumed, if in addition to attending school, a student has children or is married, the constraints on their time and ability to study and attend classes would be negatively impacted. In Leppel's (2002) study of entering baccalaureate college students and whether they persisted to the second year, the effect of marriage and children was assessed. In this study, marriage didn't have a statistically significant effect on persistence for men or women. However, having children appeared to have a positive effect on single women, but marriage and children together have a negative impact on both men and women. These findings were supported by Stratton, O'Toole, and Wetzel's (2008) study, which found no statistical difference in married versus unmarried male-female college likelihood to persist. In addition, the presence of a young child leaves women more likely to drop out of college but men are more likely to continue their enrollment. According to Fry (2004), Hispanic students are twice as likely as white undergraduate students to have children, elderly dependents, and to be single parents. These factors put minority students at a greater risk for not completing an undergraduate degree.

Opportunity to transfer. The opportunity to transfer measures a student's perception of the difficulty to transfer to another university. Earlier studies demonstrated that residential, full-time students had a greater likelihood of transferring to another university (Bean & Metzner, 1985). According to Bean, the opportunity to transfer would have a direct effect on a student's desire to leave, as would the other environmental factors. In a 1982 path model analysis of Bean's Student Attrition Model with 1,574 college freshmen, the three highest ranked variables (in order) accounting for attrition were: intent to leave, grades, and opportunity to transfer (Bean, 1982). The opportunity to transfer, as with the other four environmental pull factors, cannot be directly controlled by the university, but there are opportunities at the university level to improve college student degree completion through targeted policy and program modifications.

Bean's model and college-completion studies. The Student Attrition Model Bean developed was studied extensively in the 1980s at primarily single midwestern institutions with freshmen students (Bean, 1982, 1983, 1985; Bean & Metzner, 1985). However, in these studies, the definition of attrition was continued enrollment from spring semester freshman to spring semester sophomore year (Bean, 1983; Nora, Cabrera, Hagedorn & Pascarella, 1996), fall semester freshman year to fall semester sophomore year (Bean, 1985; Bean & Metzner, 1985, 2005) or intent to persist after the freshman year (Eimer & Pike, 1997).

Titus used constructs of Bean's Model to evaluate factors having a positive impact on student's persistence at the same institution for 3 years. The sample was limited to first-time, degree-seeking undergraduate students at 4-year institutions of higher education. The study included 5,151 students from 384 colleges or universities (Titus, 2004). The student data was obtained from the 1996–1998 beginning postsecondary student survey and included the Bean's background, academic integration, and environmental pull variables. Titus reported several constructs of Bean's Model helped explain student persistence (as defined as 3 year of continuous enrollment at the same institution), specifically student background variables, and academic and social integration. However, there was a positive association with hour's worked, financial need, and student persistence, which contradicts other studies (Pascarella & Terenzini, 2005; Titus, 2004). In Titus's follow-up study, the results were different. Titus (2006a) utilized the 1996–2001 beginning postsecondary student survey to compare the similar constructs of Bean's Model to college completion in 6 years. This study consisted of 5,776 first-time freshman students in 400 school of higher education. The results of Titus's second study supported that constructs of Bean's Model demonstrated a positive association with college completion, and financial needs and hours worked had a negative association with degree completion. Titus recommends that additional studies utilizing Bean's Model be done, and in particular to determine the relationship between college completion and other variables at highly selective schools (Titus, 2004).

Summation of Bean's model. Bean's Nontraditional Student Attrition model was derived from the work of Tinto and an analysis of more than 40 prior studies regarding student departure factors (Bean & Metzner, 1985). In a follow-up study of Bean's Nontraditional Student Attrition model, this conceptual model was supported by a study at a midwestern university to evaluate student departure and continued enrollment (Metzner & Bean, 1987). Likewise, Nora and Cabrera (1996) found environmental pull factors had a significant effect on persistence for minority college students in a national study of 3,900 freshmen for the National Center on Teaching, Learning and Assessment. In contrast, an Elkins, Braxton, and James (2000) study in a public 4-year institution with an enrollment of 8,000 students, the researchers concluded that college persistence is greater if the student separates from family and community. Other theorists have recommended continued research involving Tinto and Bean's models, with the inclusion of additional factors pertinent to minority college students (Elkins et al., 2000; Just, 1999; Metz, 2004; Pascarella & Terenzini, 2005).

Even though Bean's Nontraditional Student Attrition model contributed to the understanding of factors that impact college student departure and completion, there still remained a significant difference in completion rates among ethnic groups that needed to be explored. This situation provided a motivation for other researchers to examine factors not included in Tinto or Bean's models that could help explain this gap in minority completion rates.

Climate of Prejudice and Discrimination

The economic and social loss to the individual and society when minority students fail to complete a postsecondary degree has been an ongoing concern for policy makers and practitioners (KewalRamani et al., 2007: Museus et al., 2008; Seidman, 2005). Although the percentage of total minority undergraduate college student enrollment has increased from 17 percent in 1976 to 36 percent in 2004, they continue to leave college at a higher rate than non-minority students (KewalRamani, Gilbertson & Fox, 2007; Seidman, 2005). As a result, researchers have looked for factors specific to the minority student population that may account for this difference in college completion rates, including academic preparedness, financial aid, social and academic integration, and the campus climate of prejudice and discrimination (Mortenson, 2005; Museus et al., 2008; Swail, Redd, & Perna, 2003). The concept of the campus climate relative to prejudice and discrimination from peers, faculty, and staff became the focus of research starting nearly 4 decades ago.

In the 1980s, Fleming (1984) examined the effect of a climate of prejudice on the cognitive growth of college students. Based on this research, other theorist began exploring the effect of a climate of prejudice on a campus to other aspects of college student performance. Cabrera's studies examined the resulting alienation experienced by minority students on predominately White campuses (Cabrera et al., 1999). It was postulated that minority students' decisions to leave was affected by the additional stress of racism and discrimination experienced on campus. Subsequently, Cabrera and Nora (1994) developed a Perception of Prejudice and Discrimination scale to assess the prejudice-discriminatory experiences of a student on campus and in the classroom. In 1999, they studied the impact of the factors in their Perception of Prejudice and Discrimination scale, along with components of Bean's model on Black college student dropout rates (Cabrera et al., 1999). The sample comprised 18 4-year institutions of higher education that participated in the National Study of Student Learning. The sample consisted of 1,454 first-time students, 1,139 White and 315 African American, and persistence was defined as reenrollment in the fall sophomore semester. For Black students, the campus climate of racism and prejudice exerted an indirect small effect; however, parental encouragement had a larger effect for White students. The authors recommend additional research including other minority groups.

A campus climate of racism and prejudice did have a small effect on Black students' decisions to leave college. This still left unanswered questions, such as: Would the results be similar if other minority ethnic groups were included in the study?; Could there possibly be other factors still unaccounted for in the differences between minority student degree completion rates?

Climate of prejudice and discrimination and college-completion studies. During the past several decades, the negative impact of a hostile campus environment on minority college students has been researched. Hurtado and Carter (1997) reported the results of a survey of 493 freshman Latino students identified as top PSAT performers and semifinalists for a national scholarship award. These students were followed for 3 years and the perception of a hostile racial environment in the freshman year had a long-lasting impact on the student's sense of belonging into their junior year of studies. Other researchers noted a similar trend in how a minority students' perceptions of a campus climate of prejudice and discrimination can negatively affect a student's campus experience (Chang, 2001; Hughes et al., 1998). This led researchers to speculate whether these differences in how minority students perceive a hostile racial climate could also have a negative impact on college completion.

Museus et al. (2008) performed a study to evaluate the impact of a campus climate of prejudice and discrimination on college student completion at a 4-year institution. The 1996 postsecondary student study consisted of 8,492 first-time freshman students who were interviewed three times beginning in their freshman year, and ending 6 years after matriculation. The dependent variable Degree Completion was obtaining a Bachelor's degree in 6 years. The independent variable Campus Racial Climate was a dichotomous satisfaction with the campus racial climate. In addition there were additional mediating factors such as academic and social involvement, and institution and goal commitment. This study's findings supported prior research that different minority groups perceive and respond to a campus climate of racism on campus differently. Although the Black students were the least satisfied of all the minority groups with the racial climate on campus, it did not have a negative impact on degree completion. Only the Hispanic students demonstrated an indirect effect between a higher level of satisfaction with the campus racial climate and successful degree completion. This conflicts with the results of Cabrera's studies in 1999; however, Museus et al. recommend further studies be done since a climate campus of racism was measured by a single variable versus a specific measures of campus prejudice and discrimination that a student might experience.

In addition, when college completion rates are analyzed by ethnic group, the Asian-Pacific Islander group does not conform to other minority groups. From 1990 to 2005, the percentage of adults age 25 or older with bachelor's degrees as the highest level of education attainment was 24% Asian-Pacific Islander, 13% White, 6% Black, and 5% Hispanic (KewalRamani et al., 2007). In the past, research often excluded Asian students or combined them with White students since their academic performance was an outlier compared to other minority groups (KewalRamani et al., 2007; Yeh, 2002). However, Yeh (2002) and Moua (2007) contend that Asian students are perceived as high academic achievers and are overlooked in regard to receiving additional support services to remain in college. Researchers identified the Hmong population is growing dramatically in the United States but its postsecondary enrollment significantly lags the general population (Moua, 2007).

Also, could there be additional factors beyond Bean and Cabrera and Nora models that would also account for the higher levels of college degree completion for Asian students than other minority students? Recent studies have tried to identify additional precollege experiences and their possible effect on minority students' decisions to remain in college. In particular, they have looked at the concept of social capital.

Social Capital

Bourdieu. Early in the 19th century, the concept of social capital was first utilized to describe how collaboration and cooperation between individuals can increase community support, and ultimately benefit the schools and community as a whole (Putnam, 2000). It wasn't until later in the 1970s that sociologist Pierre Bourdieu, in his fieldwork in Kabylia, Algeria, described the tenets of social capital within the framework of the community activities he observed. Bourdieu reflected on the social structure that was obvious and also hidden within the social system, through the customs of marriage and pedagogy. A central tenet of Bourdieu's classic study is the concept of habitus, a method of reproducing "the objective structures (i.e. of language, economy, etc.)" (Bourdieu, 1972, p. 84), whereby social formations tend to reproduce themselves. Each member of the community consciously and unconsciously is "a producer and reproducer of objective meaning" (p. 79). Many researchers interpret the concept of habitus to have two sides: an internalized structure (which constitute the principles of the culture) and the physical embodiment of objective structure (Acciaioli, 1981; Nash, 1999).

Later in his studies, Bourdieu elaborated on the reproduction of culture within a society by the transfer of social capital. In 1973, Bourdieu outlined, in *Cultural Reproduction and Social Reproduction,* how cultural wealth is transmitted between the social classes. Education is compared to economic capital, and he explains how professionals "invest" (p. 93) by sending their children to the best schools in order to assure a transfer of social capital. In this context, social capital is defined as a "capital of social relationships"

(p. 93), which is similar to any investment, an investment "which may serve as a currency, for instance, in a political career" (p. 93). The volume of social capital that one obtains depends upon the size of the network connections and the volume of capital the individuals within the network possess (i.e., economic, cultural, etc.; Saunders & Serna 2004). Bourdieu (1973) went on to explain how education appeared to provide all students with an equal access for advancement in society, but in reality it reinforces the socioeconomic class into which one was born. To be a member within a social group requires an exclusive component that does not allow outsiders to participate. This concept of a class system that is preserved by a dominant group as a function of social capital is unique to Bourdieu and not universally accepted by other social capital theorists.

Coleman. In building upon the work of Bourdieu relative to social capital theory, James Coleman (1990) also assumed that there is a closure in the social relations and dense social networks within a group. However, Coleman views the concept of closure within a group as a distinct advantage of social capital theory for the benefit of the individual, group, and, ultimately, society as a whole.

The topic of educational equality and the factors that impacted education in the United States was a focus of research for James Coleman. In 1966, he chaired a federal commission that published *Equality in Education in the United States,* a report focusing on public school education (James S. Coleman, 2008). Coleman observed that students in private high schools were less likely to dropout and more likely to pursue a higher degree. Building upon Bourdieu's concept of social capital, Coleman attributed the support of parents and support from community members for the difference in academic achievement when controlling for other variables. Coleman describes social capital on two levels: the relationship between the student and his or her family, and the relationship between the student's parents and other adults in the community (Coleman et al., 1982). According to Coleman (1987):

> What I mean by social capital in the raising of children is the norms, the social networks, and the relationships between adults and children that are of value for the child's growing up. Social capital exists within the family, but also outside the family, in the community. (p. 36)

The concept of social capital is further defined by Coleman (1990) by its function—a "variety of entities" (p. 302)—with two distinct characteristics—"They all consist of some aspect of a social structure, and they facilitate certain aspects of individuals who are within the structure" (p. 302). All social relations and social structures facilitate some form of social capital (Coleman, 1988). This additional social capital is beneficial to the individual, but also to the society as a whole.

Coleman also describes one central property of social networks, which he defines as "closure of social networks" (Coleman, 1988, p. S105). Sanctions against others in a social network can be applied through a combined effort of the group members. Through the closure of a social structure, there can be trustworthiness within the system that "allows the proliferation of obligations and expectations" (p. S107). Coleman stated that this concept of closure within a social structure actually creates trustworthiness, with or without the imposition of group norms. Other sociologists have expanded upon the concept of social capital to include a more global perspective that includes a network theory of social interactions.

Lin. Advancing the theory of social capital developed by Coleman and Bourdieu, Lin conceptualized building a network theory of social capital. Contrary to the concept of a closed network, Lin proposes that searching for or obtaining resources requires an open network (Lin, 2001). For the privileged class, having a closed social structure is preferred for preserving or reproducing resources (Bourdieu, 1972). However, Lin advances the theory that rather than searching for and obtaining resources, such as looking for another job, “access and extending bridges in the network would be more useful” (Lin, 2001, p. 10). From Lin’s perspective, embedded resources within the social network can be used to promote or suppress the members of the group. Inequalities within social groups exist because of “constraints, people in lower socioeconomic status tend to use local ties, strong ties, and family and kin ties. Since these ties are usually homogeneous in resources, this networking tendency reinforces poor social capital” (Lin, 2000, p. 789). Deficiencies in the social network for racial and ethnic minority groups could account for the unequal achievement noted in academia and in the work place.

Putnam. The social networking conceptualized by Coleman and Lin on a family and community level have eroded during the past several decades. Social capital is defined as the “connections among individuals” (Putnam, 2000, p. 19), the social network, and trustworthiness that were originally described by Lin and Coleman. Putnam explains how embedded in a dense network of reciprocal social relations is a concept of civic virtue. Having a community of people working together for the common good enhances social capital and thus the community at large. According to Putnam (1995), Americans are less trusting even when controlling for other factors. There has been erosion in social connectedness on the family and civic level, as individuals spend less time with community groups, neighbors, and even their family. Putnam recognized the value of social capital on an individual and ultimately a societal level. Putnam's view of social capital mirrors the concept of academic and social integration that is part of Bean's model, where the student networks and interacts with the faculty and students at the university he or she attends.

Social capital and college-completion studies. Recent studies have demonstrated that social capital defined by family support has a positive effect on college choice decisions for Hispanic students (M. Hurtado-Ortiz & Gauvain 2007; Perez & McDonough, 2008; Perna & Titus, 2005). In addition, these social capital factors are an important component of Asian students' secondary academic achievement (Yeh, 2002; Yosso, 2005). However, there need to be studies examining the long-range effects of social capital on postsecondary educational completion rates (Fry, 2002; M. Hurtado-Ortiz & Gauvain, 2007).

Perna and Titus' (2005) study examined parental involvement and postsecondary college enrollment for different racial-ethnic groups, drawing upon the work of Coleman (1988) and Lin (2001). Parental involvement was conceptualized by the relationship with the parent to student, parent to school, and parent to parent. The data set was the National Education Longitudinal Study 1992, 1994, a cohort of students as they matured from high school seniors to 2-years postgraduation. The results supported the supposition that parental involvement was positively related to college enrollment and persistence regardless of school and individual resources. The researchers concurred with Coleman (1988) that parents do serve as a form of social capital that conveys family norms and standards that promote successful entry into college (Perna & Titus, 2005).

There was also a positive relationship between Coleman's (1988) definition of social capital operationalized by parental attitudes related to college and parent-student interactions, and the likelihood of college persistence and completion (Garrison, 2003). In addition, variables that measured volunteerism on campus were utilized to represent Putnam's (2000) view of social capital as community involvement. All racial groups were represented in this longitudinal data collected by the NCES from 1998–2004, although 66% of the 8,799 students in the sample were White. The researcher noted the strong correlation between social capital and college completion and recommended additional studies that utilized constructs of Coleman (1988) and Puntam's (2000) theories. However, the definition of college completion was a certificate or associate degree, awarded at 2 years, or continued enrollment at 4-years toward a baccalaureate degree (whether they obtained the degree; Garrison, 2003). Although social capital is an important factor in minority college student enrollment, it is still uncertain whether this concept supports students throughout their college experience and enhances the rate of college completion.

Summation of social capital theory. The importance of social capital at the individual, family, and societal level has been discussed and evaluated throughout the past several decades by renowned sociologists. Although there is no simple definition for social capital, the major tenets of this complex concept are the social structures and networks and their impact on the individual, group, and society. For secondary students, a measure of their social capital is family support (i.e., parental encouragement, older sibling with educational experience). Therefore, for this study, the concept of social capital is viewed from the lens of a closed group model that Coleman developed. Social capital is operationalized in this study as family support during high school and freshman year in college.

There have been great strides in the understanding of minority college student departure and persistence in college, including Bean's model, and Cabrera and Nora's Perception of Prejudice and Discrimination. However, few studies have looked at these factors in a longitudinal relationship to degree completion (Fry, 2002; Ishitani, 2006; Pasarella & Terenzini, 2005,). In addition, many of the studies involving student completion are based exclusively on a retrospective study of data collected from a national study (Ishitani, 2006; Titus, 2006b).

Summary

Beginning with Tinto's (1975) classic study, the research was based on a short-run analysis of factors related to college student departure. Subsequently, the research focus shifted to a long-run analysis of how these same factors impacted college student degree completion. Although there have been numerous studies involving college student departure, most are limited to the 1st year of college (Pascarella & Terenzini, 2005). Studies that have looked at persistence factors specific to minorities, such as a climate of prejudice and social capital, have not evaluated their effect on 6-year completion rates (Cabrera et al., 1999). The demographic changes in the U.S. population during the last decade have been significant. In 2005, Hispanics constituted the largest minority group in the United States, but also had one of the lowest college completion rates (Fry, 2002). In many prior research studies, this ethnic group has been underrepresented.

There is a lack of research that has looked at factors affecting college 6-year completion rates for minority students. This study is unique because it examines traditional college student departure factors and other factors specific to college success for minority college students: Climate of Prejudice and Discrimination and Social Capital theory, and their impact on 6-year college completion rates. Another unique aspect of this study is it incorporates multiple institutions with a large sample of Hispanic, Asian, and Black college students. This study will provide insight into the different factors affecting completion rates for minority college students.

Chapter Three: Methodology

The purpose of this study is to evaluate the predictive value of background, academic integration, social integration, environmental pull, perception of prejudice and discrimination, and social capital variables on 6-year college completion rates for minority college students. Chapter Three provides an overview of the research design, population and sample, data acquisition, and data analysis to answer the research questions that are the focus of this study. Additional information and insight is provided regarding the dependent and independent variables of interest in this research proposal.

Research Design

The research design for this study is a cross-sectional, predictive study, and it is nonexperimental since there is no manipulation of the variables (Johnson, 2001). For this cross-sectional research, the data will be collected from the undergraduate college students during their freshman year in college—at the beginning of the fall semester and during the spring semester, and later their college completion data. The research design is a predictive study to determine how well the independent variables forecast the dependent variable, 6-year college degree completion.

Population

The study uses data from the National Longitudinal Survey of Freshman (NLSF). The NLSF is a national sample of first-time, U.S. citizen or resident alien college students at 28 highly selective institutions. These institutions were derived from an Andrew Mellon Foundation study by Bowen and Bok (1998) that followed the path of minority students after college graduation, titled *The Shape of the River*. The 28 institutions represent a reasonable geographic spread and have similar high admission standards and policies. The purpose for building the Bowen and Bok (1998) database was to provide a new resource for evaluating the "black-white differences" (p. xxvi) among this subset of selective institutions. The NLSF researchers wanted to examine the differences among Asian, Hispanic, Black, and White students as they matriculate into college, since Bowen and Bok focused on minority students' accomplishments after graduation. The NLSF study was designed to examine the characteristics of minority students as they entered college and how these shaped their academic progress (Massey, Charles, Lundy, & Fisher, 2003). The researchers stated that despite "a multitude of studies" (p. 2) there is a gap in research on a national level to investigate determinates of college completion among minority students. The NLSF study was designed to provide reliable data for future research to evaluate different theoretical models of minority college student attendance and completion.

The NLSF data included both liberal arts colleges and research universities that "constitute an elite sample" (Massey et al., 2003, p. 29), which was measured by the average combined verbal and math SAT scores of the entering class. In addition, one historically Black institution, Howard University, agreed to participate in the study. In Table 2 there is a list of the 28 institutions included in the NLSF study, each institution's overall freshman SAT scores, the percentage of admitted freshman in the top 10% of their class, and final student sampling numbers (Massey et al., 2003). As a measure of selectivity, the average freshman SAT score across these 28 institutions was 1,243 and 71% were in the top 10% of their graduating class. The population for this study is defined as the incoming freshmen (U.S. Citizen or resident alien) for the 28 select colleges and universities listed in Table 2. Since the institutions in the study constitute a group of select schools with high admission standards, the findings cannot be extrapolated to the whole of higher education. This is a limitation of the NLSF database for this study, but this database also provides a unique opportunity to assess differences in minority students at a variety of selective institutions.

Table 2

Final Sample and Indicators of Institutional Quality for Colleges and Universities Included in the NLSF

Category and Schools	Final Sample (Number of Students)	Median SAT Score for Incoming Freshman	% Freshman in Top 10% of Class
Historically Africa American Colleges			
Howard University, Washington DC	60	1,105	18
Schools with 1,000+ African American Students			
University of Michigan, Ann Arbor, MI*	362	-	63
University of North Carolina, Chapel Hill, NC*	268	1,250	68
University of California, Berkeley, CA*	304	1,315	98
Schools with 500–1,000 African American Students			
Columbia University, New York, NY	237	1,400	87
Emory University, Atlanta, GA	197	1,355	90
Miami University, Oxford, OH*	204	-	32
Northwestern University, Evanston, IL	224	1,385	83
Penn State University, Park, PA*	261	1,190	42
Stanford University, Palo Alto, CA	216	1,455	88
Tulane University, New Orleans, LA	221	1,292	52
University of Pennsylvania, Philadelphia, PA	220	1,400	91

(*continued*)

Table 2 Continued

Category and Schools	Final Sample (Number of Students)	Median SAT Score for Incoming Freshman	% Freshman in Top 10% of Class
Schools with 100–500 African American Students			
Georgetown University, Washington, DC	89	1,350	78
Oberlin College, Oberlin, OH	79	1,325	59
Princeton University, Princeton, NJ	86	1,450	92
Rice University, Houston, TX	97	1,415	86
Tufts University, Sommerville, MA	83	1,340	70
University of Notre Dame, South Bend, IN	91	1,345	83
Washington University, St. Louis, MO	90	1,355	79
Wesleyan University, Middletown, CT	94	1,365	70
Williams College, Williamstown, MA	91	1,410	84
Yale University, New Haven, CT	89	1,465	95
Schools with less than 100 African American Students			
Barnard College, New York, NY	57	1,315	73
Bryn Mawr College, Bryn Mawr, PA	37	1,300	61
Denison University, Granville, OH	39	1,215	52
Kenyon College, Gambier, OH	41	1,295	50
Smith College, Northampton, MA	41	1,280	52
Swarthmore College, Swarthmore, PA	47	1,418	82
TOTAL *Public Institution	3,924 Total Students	1,243 Average Score	71 Average Percentage

Note. *Note*. Adapted from *The Source of the River* by D. Massey, C. Charles, G. Lundy, and M. Fisher, 2003. Copyright 2003 Princeton University Press.

Sample

The NLSF was developed to provide comprehensive data to promote the testing of different theoretical explanations for minority college students' underachievement (Massey et al., 2003). From each institution, a list of incoming freshmen was obtained to use as a sampling frame. A stratified random sample of 4,573 students from 28 institutions (Table 2) was selected to participate, with 3,924 students completing the fall survey for a response rate of 86%. Students had to be first-time freshmen and U.S. citizens or resident aliens.

Equal sized samples of Black, Asian, Hispanic, and White entering freshmen students were taken from each institution, which resulted in an oversampling of minority students (see Table 3). The sample was stratified relative to the number of Black students in the student population. For example, institutions with a relative large number (1000+) of Black students in the student population, were assigned a target sample size of 280 respondents (70 in each of the four racial groups: Black, Asian, Hispanic, and White; Massey et al., 2003).

Table 3

Number of Respondents to the NLS Wave 1 and 2

	Total	White	Sub-Total Minority	Asian	Hispanic	Black
Wave: Fall 1999						
Number Selected	4,573	1,202	3,371	1,118	1,071	1,182
Percent Competed	85.8%	83.0%	86.7%	85.8%	85.5%	88.9%
Number in Baseline	3,924	998	2,926	959	916	1,051
Wave II: Spring 2000						
Completed Follow-Up	95.0%	93.7%	95.4%	95.9%	94.3%	96.0%
Number in Wave II	3,728	935	2,793	920	864	1,009

Note. Adapted from *The Source of the River* by D. Massey, C. Charles, G. Lundy, and M. Fisher, 2003. Copyright 2003 Princeton University Press.

The NLFS database comprises a series of surveys administered throughout the course of the students' first four years in college. These students were surveyed longitudinally:

freshman Fall semester 1999 (Wave 1), freshman Spring semester 2000 (Wave 2), and subsequently each Spring semester through senior year (2001–2003, Wave 3–5). In addition, completion data was obtained at both 4 and 6-year post admission. Although some survey items were collected annually from freshman to senior year, for this study, only variables sampled separately in the Fall or Spring semester of the freshman year will be employed.

In order to maintain the students' confidentiality, the public NLFS data set does not contain specific identifiers for the institution each student attended, only an indication of the type of institution, specifically: public or private research university, or liberal arts college (Massey et al., 2003). Three previous studies utilizing the private NLSF data set were able to correct for unobserved heterogeneity in the data because of the possibility that students within the same institution were similar in a way not accounted for by the theoretical model. However, it was reported that controlling for clustering within schools was not imperative, since there was a small percentage of the total variance that could be attributed within the context of the college attended (Chiang, 2011; B. Cox, 2010; Fisher, 2003). This study will utilize only the data for the minority students—Black (*n* = 1,051), Asian (*n* = 959), and Hispanic (*n* = 916)—for a total of 2,926 students who were originally selected for the NLSF survey in the Fall semester 1999 (Wave 1).

Instrumentation

The Temple University Institute for Survey Research conducted the survey process, using computer assisted personal interview and computer-assisted telephone interview, a computer-assisted data collection software. Data were collected in a series of waves, beginning with a lengthy 2-hour, in-person computer-assisted personal interview survey conducted in the beginning of the freshman year 1999 (Wave 1). This baseline, 151-question survey collected detailed information about the neighborhood, family, and educational environment students experienced before entering college. Also, the survey assessed their attitudes, aspirations, and motivations at the time of entry, including parents' habits, characteristics of their friends and peers, and feelings toward their racial-ethnic group. Validation of internal validity was reported with a Cronbach's alpha score for the constructs of social scales included in the survey. Within the questionnaire, constructs of the social scales reported Chronbach alpha scores for Social Capital .778, Support for Academic Effort .819, High School: Quality of Infrastructure .759, and Quality of Teaching .702 (Massey et al., 2003).

Subsequent follow-up surveys were conducted over the telephone using Computer assisted telephone interview, during the spring of each academic year from 2000 to 2003 (Waves 2–5). These follow-up surveys gathered information from the same students regarding their social, psychological, and academic experiences on campus. The response rate from the students who were interviewed in Fall 1999, and those students who subsequently completed the follow-up survey in the Spring 2000 was very high, 95% (Table 3).

Graduation data for the students in the NLSF study were drawn from two sources: office of the registrar for the participating 28 institutions and the National Student Clearinghouse, a nonprofit organization that provides postsecondary student degree, diploma, and enrollment verification. With an analysis of data from these two sources from 2005 to 2006, the NLSF group was able to collect concrete graduation data for 3,914 of the original 3,924 students who participated in the original study. For these students, 68.7% graduated in 4 years and 86.5% graduated in 6 years. These high graduation rates are expected considering the high academic level of students entering select United States institutions.

Dependent variable. For the research study, the dependent variable is dichotomous for graduation completion at 6 years (see Table 4). The variable *overallg* captures all students who graduated from the original or transfer college within 6 years.

Table 4

Survey Items for College Completion

Original Variable Code	Original Question	Coded Responses
overall	Graduation within 6 years	0 = Not graduate from college (original or transfer) within 6 years 1 = Graduated from college (original or transfer) within 6 years

Note. Adapted from *The Source of the River* by D. Massey, C. Charles, G. Lundy, and M. Fisher, 2003. Copyright 2003 Princeton University Press.

Independent variables. The independent variables for this study can be subdivided into six theoretical groups: Background, academic integration, social integration, environmental pull, perception of prejudice and discrimination, and social capital.

Background. These 5 survey items include the traditional demographic information, such as sex, race, foreign born student, and/or parent. For location where the mother and/or father were born, the answer will be recoded as a nominal response: in or outside of the United States. Since most of these background variables are measured on a nominal scale, a dummy variable will be assigned using the CLASS statement within SAS program. The type of college the student attends will be included; however, the specific college or university was not utilized in order to maintain the anonymity of the student(s). Table 5 lists the original question and coded response(s) for each of each of the Background variables in the study.

Table 5

Survey Items for Background Variables

Original Variable Code	Original Question	Coded Responses
College	Type of College	1 = Liberal Arts College 2 = Private Research University 3 = Public Research University
Sex	Sex of Respondent	0 = Male 1 = Female
w1qzeth	Respondents Ethnicity	1 = Black-African American 2 = Caucasian-White 3 = Asian 4 = Hispanic or Latino
fborn	Student born in the U.S.	1 = Yes 0 = No
w1q166	Where was your biological or adoptive mother born?	1 = United States 0 = Outside United States
w1q167	Where was your biological or adoptive father born?	1 = United States 2 = Outside United States

Academic integration. According to Bean (1990), academic integration includes the skills and attitudes needed to succeed in college. For this study, academic integration is divided into three categories: study habits, relationship with faculty, and major uncertainty.

Study habits includes six questions that utilize a Likert scale (1 = never to 10 = everyday), to explore a student's ability to remain focused on his or her studies and not become distracted by his or her environment. Relationship with faculty is probed with four questions (Likert scale: 1 = never to 10 = everyday) that explore a student's interaction with faculty. One question probes whether a freshman student has a declared major, three other questions on a 10-point Likert scale (0 = extremely unlikely to 10 = extremely likely) probe a student's intent to persist in college. Table 6 lists the original question and coded response(s) for each of the Academic Integration constructs in the study.

Table 6

Survey Items for Academic Integration

Original Variable Code	Original Question	Coded Responses
Study Habits		
w2q16a	I was trying to study, but was distracted by talking or conversation.	0 = Never 10 = Everyday
w2q16b	I was trying to study, but was distracted by someone playing a stereo.	0 = Never 10 = Everyday
w2q16c	I was trying to study, but was distracted by someone watching TV	0 = Never 10 = Everyday
w2q16d	I was trying to study, but was distracted by friends partying	0 = Never 10 = Everyday
w2q16e	I was trying to study but friends talked me into going out	0 = Never 10 = Everyday
w2q16f	I had to leave home to get my school work done	0 = Never 10 = Everyday
Relationship with Faculty		
w2q23b	Raise your hand during a lecture when you don't understand something?	0 = Never 10 = Everyday
w2q23c	Approach professors after class with a question	0 = Never 10 = Everyday
w2q23d	Meet with your professors in their offices to ask about material you don't understand?	0 = Never 10 = Everyday
w2q23e	Meet with your professors in their offices to talk about other matters?	0 = Never 10 = Everyday
Major Uncertainty		
W1q92	Have you already chosen a major?	0 = Yes 1 = No

(*continued*)

Table 6 Continued

Original Variable Code	Original Question	Coded Responses
W1q91a	Please estimate the probability that you will complete each of the following education milestones. That is, on a scale from 0 to 10, where 0 means it's extremely unlikely and 10 means it is extremely likely. What is the likelihood that you will finish one year of college?	0 = Extremely unlikely 10 = Extremely likely
W1q91c	Graduate from college?	0 = Extremely unlikely 10 = Extremely likely
W1q91e	Complete a graduate or professional degree?	0 = Extremely unlikely 10 = Extremely likely

Social integration. The student's social integration on campus is determined through inquiry into three areas of a student's life: close friends on campus, living arrangements, and off-campus visits. Sixteen questions w2q38a through w2q38p survey friends' and close acquaintances' support and attitudes, using a 10-point Likert scale (1 = no importance to 10 = utmost importance). These questions were not included in Bean's (1983) model of social integration; however, these questions provide additional insight into the influence peers have on academic achievement. Living arrangement is coded to determine whether a student lives on or off campus in an apartment or dorm, a fraternity or sorority, or with his or her parents. Table 7 lists original question and coded response(s) for each of the Social Integration constructs in the study.

Table 7

Survey Items for Social Integration

Original Variable Code	Original Question	Coded Responses
Close Friends on Campus		
	How important is it to your friends and close acquaintances at (College) to:	

(*continued*)

Table 7 Continued

Original Variable Code	Original Question	Coded Responses
w2q38a	Attend classes regularly?	0 = No importance 1–9 10 = Utmost importance
w2q38b	Study hard?	0 = No importance 1–9 10 = Utmost importance
w2q38c	Play sports?	0 = No importance 1–9 10 = Utmost importance
w2q38d	Get good grades?	0 = No importance 1–9 10 = Utmost importance 98 = Don't know 99 = Refused
w2q38e	Be popular and well-liked by students?	0 = No importance 1–9 10 = Utmost importance
w2q38f	Graduate from college?	0 = No importance 1–9 10 = Utmost importance
w2q38g	Have a steady boyfriend or girlfriend?	0 = No importance 1–9 10 = Utmost importance
w2q38h	Spend time with friends just hanging out?	0 = No importance 1–9 10 = Utmost importance
w2q38i	Be willing to party, get wild?	0 = No importance 1–9 10 = Utmost importance
w2q38j	Go on to graduate or professional school?	0 = No importance 1–9 10 = Utmost importance
w2q38k	Participate in religious activities?	0 = No importance 1–9 10 = Utmost importance
w2q38l	Be happy and personally satisfied?	0 = No importance 1–9 10 = Utmost importance
w2q38m	Do community work or volunteer?	0 = No importance 1–9 10 = Utmost importance
w2q38n	Have a part-time job to pay for school?	0 = No importance 1–9 10 = Utmost importance
w2q38o	Study something practical?	0 = No importance 1–9 10 = Utmost importance
w2q38p	Study something interesting and creative?	0 = No importance 1–9 10 = Utmost importance

(*continued*)

Table 7 Continued

Original Variable Code	Original Question	Coded Responses
Living Arrangements		
W2q11	Do you presently live in:	1 = an on-campus dormitory, 2 = an off-campus dormitory, 3 = an on-campus apartment, 4 = an off-campus dormitory, 5 = a (fraternity/sorority) house 6 = with your parents 7 = with another relative

Environmental pull. Bean (1990) contends that minority students are similar to nontraditional students, and there are elements outside of the college environment that impact college graduation. The factors outside the college experience that pull at students are a lack of finances and work role. There is one Likert scale question that asks about students' difficulty with financial aid. For the work role, there is one Likert scale question that probes whether a student's work it is part of the financial aid package. Table 8 lists the variable coding, question, and response(s) for the study's Environmental Pull constructs.

Table 8

Survey Items for Environmental Pull

Original Variable Code	Original Question	Coded Responses
Lack of finances		
w2q32b	I am having problems with my financial aid	0 = Total disagreement 1–9 10 = Total agreement
Work Role		
w2q28e	Are you required to work as part of (college's) financial aid package?	1 = Yes 0 = No

***Perception of prejudice and discrimination*.** The students' perception of prejudice and discrimination was demonstrated to add additional stress to minority college students and affect their sense of belonging (Hurtado, 1997). The perception of prejudice and discrimination was explored using six questions examining the ethnic-racial climate on campus, and five questions examining the prejudice of faculty and staff. These are measured on a Likert scale from 1 = never to 5 = very often. These questions' purpose is to probe into students' perception of a campus climate of racism and prejudice they experience both within the classroom and in different venues around the campus. Table 9 lists the variable coding, question, and response(s) for each Perception of Prejudice and Discrimination construct.

Table 9

Survey Items for Perception of Prejudice and Discrimination

Original Variable Code	Original Question	Coded Responses
Ethnic/Racial Climate		
W2q39	How often, if ever, have student(s) in your college classes ever made you feel uncomfortable or self-conscious because of your race or ethnicity? Is it:	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q41	Walking around campus, how often, if ever, have you been made to feel uncomfortable or self-conscious because of your race or ethnicity?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q42	Except for security guards at building entrances, how often, if ever, have the campus police asked you to present identification?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q43	How often, if ever, have you heard derogatory remarks made by fellow students about your ethnic group?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q46	How often, if ever, have you experienced any other form of harassment on campus simply because of your racial or ethnic group?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often

(*continued*)

Table 9 Continued

Original Variable Code	Original Question	Coded Responses
W2q47	How often, if ever, have your experienced harassment from members of your own race or ethnic group because you interacted or associated with members of some other group?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
Prejudice of Faculty and Staff		
W2q40	How often, if ever, have any of your college professors made you feel uncomfortable or self-conscious because of your race or ethnicity	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q44	How often, if ever, have derogatory remarks made by professors about your racial or ethnic groups	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q48	How often, if ever, have you felt you were given a bad grade by a professor because of your race or ethnicity?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q49	How often, if ever, have you felt you were discouraged by a professor from speaking out in class because of your race or ethnicity?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W2q45	How often, if ever, have you heard derogatory remarks made by other college staff about your racial or ethnic group?	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often

Social capital. The concept of social capital has been shown to have a positive effect on college participation and graduation rates, in particular for minority students (Hurtado-Ortiz & Gauvain, 2007; Perez & McDonough, 2008; Perna & Titus, 2005). For this study, social capital will be defined as family support during the senior year of high school and freshman year of college. Family support questions utilize a 5-point Likert scale (1 = never to 5 = very often) to explore how much the parents-other adults in the family interacted with friends, at 18 years old; and a 4-point Likert scale (1 = Strongly Agree to 4 = Strongly

Disagree) it find whether the students' parent(s) knew who their friends were in high school. There are 7 questions that use a 10-point Likert scale to access the attitudes of a student's parent(s) during the freshman year in college. Table 10 lists the original variable coding, question and response(s) for each of the Social Capital constructs in the study.

Table 10

Survey Items for Social Capital

Original Variable Code	Original Question	Coded Responses
Family Support (Senior year of high school)		
Age 18	Age 18	
w1q38d	Parent(s) (or other adults in your house) talked to your friends	1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Very often
W1q521	Mother (or woman most responsible for you) knew who your friends were	1 = Strongly Agree 2 = Somewhat Agree 3 = Somewhat Disagree 4 = Strongly Disagree
W1qq521	Father (or man most responsible for you) knew who your friends were	1 = Strongly Agree 2 = Somewhat Agree 3 = Somewhat Disagree 4 = Strongly Disagree
Attitudes of Parents (Freshman year of college)		
W2q37a	How important is it to your (parents or guardian) that you: Attend college?	0 = No importance 1–9 10 = Utmost importance
W2q37b	Work hard in college?	0 = No importance 1–9 10 = Utmost importance
W2q37c	Get good grades?	0 = No importance 1–9 10 = Utmost importance
W2q37d	Graduate from college?	0 = No importance 1–9 10 = Utmost importance
W2q37f	Go on to graduate or professional school?	0 = No importance 1–9 10 = Utmost importance
W2q37g	Study something practical?	0 = No importance 1–9 10 = Utmost importance

(*continued*)

Table 10 Continued

Original Variable Code	Original Question	Coded Responses
W2q37h	Study something that interests you?	0 = No importance 1–9 10 = Utmost importance

Note. Adapted from *The Source of the River* by D. Massey, C. Charles, G. Lundy, and M. Fisher, 2003. Copyright 2003 Princeton University Press.

Data Collection

The NLSF is a public-use data set, and access to the data set for the purpose of this study was granted by Princeton University on February 10, 2008. Subsequently, in May, 2008, the graduation data for the freshmen cohort of 1999 became available to the public.

Data Analysis

The study will use student-level information (at both the secondary and postsecondary time line) to address the following research question:

Research Question 1: What is the predictive value of Background, Academic Integration, Social Integration, Environmental Pull, Perception of Prejudice and Discrimination, and Social Capital variables on the 6-year college completion rates for Hispanic college students?

Research Question 2: What is the predictive value of Background, Academic Integration, Social Integration, Environmental Pull, Perception of Prejudice and Discrimination, and Social Capital variables on the 6-year college completion rates for Asian college students?

Research Question 3: What is the predictive value of Background, Academic Integration, Social Integration, Environmental Pull, Perception of Prejudice and Discrimination, and Social Capital variables on the 6-year college completion rates for Black college students? The analysis involved a dichotomous dependent variable: 6-year college completion rate and six independent variables: background, academic integration, social integration, environmental pull, perception of prejudice and discrimination, and social capital.

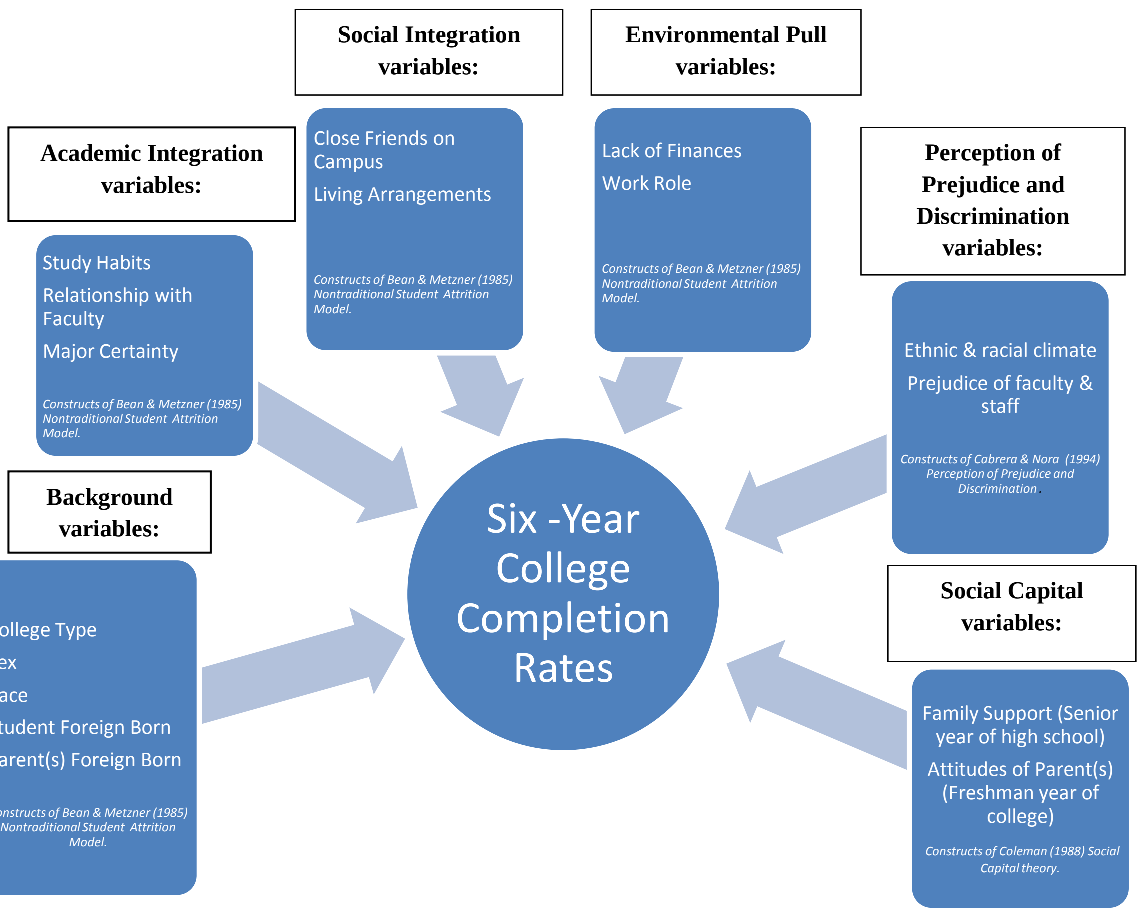

Figure 3. Conceptual model of college student completion.

Exploratory factor analysis will identify the number and nature of underlying factors with this set of data (Hatcher, 2009). A principle factor method will be used to extract identified factors and to determine which factors to retain. Through the SAS program, a PROC FACTOR statement will be utilized and a scree plot and Eigenvalue table will be produced and used to evaluate the factors identified. Following the factor analysis the internal validity of the questions will be evaluated using the Cronbach's alpha score (Kline, 1994).

With a dichotomous dependent variable, the preferred modeling analysis is Logistic Regression (Allison, 1999; O'Connell, 2006). The SAS System implements this technique in PROC LOGISTIC. Data preparation for the dependent variable will include coded (graduation in 6 years = 1, not graduating in 6 years = 0). For categorical independent variables, the CLASS statement can be used to assign dummy variables.

The logistic regression model was originally laid out by D. Cox (1970), and unlike the linear functions, by transforming the probability to odds removes the upper boundary. The logit model (or log-odds) is expressed as a linear function of the X_i.

$$\operatorname{logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i}.$$

The p_i is the probability of success the student will graduate in 6 years. Where β_0 is the intercept parameter, and β_k is the vector of slope parameters (Hosmer & Lemeshow, 2005). For each research question, the resulting logistic model will be evaluated for goodness of fit through a Hosmer and Lemeshow chi-square test.

Multicollinearity may be a potential problem with logistic regression when one or more of the independent variables are highly correlated to each other. Multicollinearity changes the reliability but not the estimate of the coefficicient. It is recommended that multicollinearity between independent variable can be evaluated by estimating the equivalent Linear Regression Model, with the independent and dependent variables, and evaluating the VIF variance inflation factor test. If there is a linear relationship between independent variables, the VIF variance inflation factor test would be high (> 4), since the VIF variance inflation factor test is the reciprocal of tolerance ($1-R^2$) and the R^2 would be inflated (Allison, 1999). Other descriptive and inferential statistics will be utilized to provide a comprehensive analysis of the relationship between the independent variables and college completion.

Delimitations and Limitations

The NLSF is a robust data set. The NLSF data set has been the subject of 2 books, 10 dissertations and 15 articles in academic journals (NLSF, 2009). The oversampling of minority students was accomplished through stratified random sampling at the institutional level for each of the 28 colleges & universities in the NLSF study. According to Tuckman (1999), random sampling is the key to overcoming any selection bias, and it increases the possibility that the sample will be representative of the population of interest. However, there are limitations that exist with the NLSF data set that will be explored.

Inherent with any study using secondary data are the limitations imposed by the data collection tool. However, the NLSF data set provides a comprehensive source of information related to a student's secondary and postsecondary experiences. In addition, this data set is unique in the volume and depth of questions asked in the study. According to the researchers, the "National longitudinal survey of Freshman was developed to provide comprehensive data to test different theoretical explanations for minority underachievement in higher education" (Massey et al., 2003, p. 20).

Another limitation involves the utilization of equal number of minority students entering select colleges and universities in the United States. Since this study includes freshmen students in some of the nation's elite schools, the findings of this study cannot be generalized to students attending less selective institutions.

Last, there is a potential for unobserved heterogeneity resulting from the possibility that students attending the same college share similar characteristics. The public use NLSF data set does not identify students by their college-university in order to maintain the confidentiality of the student's identity. However, one study that utilized the original data set determined that the interclass correlation (ICC) between schools was relatively low, and therefore, controlling for clustering within schools was not critical (Fisher, 2003).

Chapter Four: Results

The National Longitudinal Survey of Freshmen provides a unique data set for exploring the impact an array of factors has on minority college student completion. The factors in this study are a blend of three different theories related to minority college student completion, constructs of Bean's Nontraditional Student Attrition model (Bean, 1983, 1990), Cabrera and Nora's (1994) Perception of Prejudice and Discrimination theory, and Coleman's Social Capital theory (Coleman et al., 1982). The inferential and descriptive statistics presented in this chapter were analyzed with the utilization of SAS 9.3, licensed through North Carolina State University.

In presenting this study's results, descriptive statistics were used to provide a detailed description of the 2,926 freshman students. Second, the results of the multistep Exploratory Factor Analysis are presented as is the resulting identified factor structure. Last, the three research questions are evaluated using Logistic Regression and other inferential statistics.

Descriptive Statistics

For the analysis, the first-time freshmen who participated in the 1999 NLSF public data set were utilized. To be selected for the sample, students had to self-report as a minority (Black-African American, Asian, Hispanic-Latino), first-time freshman student, and have completed the questionnaire administered in the fall 1999, specifically 2,926 students. Of these minority students who completed the initial Fall, 1999 questionnaire, 959 were Asian, 916 were Hispanic, and 1,051 were Black.

Dependent variable: College completion. For this study, college completion was defined as graduation from a 4-year college or university in 6 years. The dependent variable is dichotomous and was coded as 1 = graduation at 6 years, and 0 = not graduating after 6 years. Overall for the minority students, 85% graduated in 6 years and 15% did not graduate in 6 years (9 students were lost during the 6-year period from this study, thus 2,917 total students with graduation data). For female students, 13% did not graduate versus 18% of the male students. Among the three racial groups, Black students had the highest rate of not graduating in 6 years, 21%, compared to 14% of Hispanic students and 10% of Asian Students. Table 11 shows 6-year graduates and nongraduates by gender and minority group.

Table 11

Percent of Graduate-Nongraduates by Gender and Minority Groups

	Total	Asian	Hispanic	Black
Graduates				
Male: Number (Percent)	958	372 (90%)	318 (83%)	268 (73%)
Female: Number (Percent)	1516	481 (89%)	469 (88%)	566 (83%)
Nongraduates				
Male: Number (Percent)	207	41 (10%)	66 (17%)	100 (27%)
Female: Number (Percent)	236	57 (11%)	62 (12%)	117 (17%)
Grand Total	2917			

Independent Variables: Background. The background characteristics of the students were evaluated by minority group, and included sex, foreign born student, and parents foreign born. In addition, type of college the student(s) attended was included in the background variables.

Sex. The sample of all minority students comprised 60% female and 40% male students. The predominance of female students is consistent with national trends for a higher enrollment of female students when the NLSF data was collected (Massey et al., 2003). However, the percentage of male Black students was the lowest at 35%, compared to 43% for Asian and 42% for Hispanic male students (see Table 12).

Table 12

Number and Percentage of Minority Students by Gender

	Total Minority Students	Asian	Hispanic	Black
Male: Number	1165	413	384	368
Percent	40%	43%	42%	35%
Female: Number	1752	538	531	683
Percent	60%	57%	58%	65%
Total Number Students	2917	951	915	1051

Students and parent's country of origin. In this study, the majority of minority students were born in the United States, 81% versus foreign born, 19%. However, there was a difference between minority groups, with 31% of the Asian students being foreign born compared to 19% of the Hispanic and 8% of the Black students. In addition, most minority students had a parent who was foreign born: 53% for mothers and 54% for fathers. The Asian students had the highest level of foreign-born parents (87.15% mother, 86% father), followed by Hispanic students (53% mother, 55% father). The Black students had the lowest number of foreign-born parents, 22% mother, 23% father. The complete list of the number and percentage of foreign-born students and their parents is listed in Table 13.

Table 13

Percent of Minority Students and Mother-Father Foreign Born

Country of Birth	Total Minority Students	Asian	Hispanic	Black
Student:				
Non-U.S. Born (Percent)	19%	31%	19%	8%
U.S. Born (Percent)	81%	69%	81%	92%
Mother:				
Non-U.S. Born (Percent)	53%	87%	53%	22%
U.S. Born (Percent)	47%	13%	47%	78%
Father:				
Non-U.S. Born (Percent)	54%	86%	55%	23%
U.S. Born (Percent)	46%	14%	45%	77%

College. The original 28 participating institutions were subdivided into two categories: public research institutions and private research-liberal arts institutions. The majority were private research-liberal arts, compared to a total of five public universities (see Table 2). Based on the 2,917 minority students in the study, 33% attended a public research institution and 67% attended a private research-liberal arts institution. The number of Black, Asian, and Hispanic students in each category was proportional (see Table 14).

Table 14

Number of Minority Students by College Type

College Type	Total Minority Students	Asian	Hispanic	Black
Public School	956	303	280	373
Private Research/Liberal Arts	1961	648	635	678
Total Minority Students	2917			

Exploratory Factor Analysis

Exploratory Factor Analysis is a multivariate statistical method for analyzing a given data set's underlying factor structure. Both Charles Spearman and Karl Pearson are credited with providing the conceptual framework in the development of Exploratory Factor Analysis theory (Thompson, 2004). Factor analysis was developed as a methodology to analyze data collected from psychological testing by extracting factors from a correlation matrix between tests. The mathematical model for factor analysis is the set of observable variables as linear combinations of underlying factors (Agresti & Finlay, 1997). These factors cannot be directly measured and are sometimes referred to as latent variables (Hatcher, 2009). When a factor influences more than one observed variable, it is termed a common factor.

The initial step in factor analysis is the formulation of a correlation matrix utilizing the study's variable values. The most common Exploratory Factor Analysis extraction method is principle components analysis (Thompson, 2004). Once the initial factors or principle components are produced, the factor variables are rotated thorough a variety of 360 degrees turns until the most interpretable factor solution is obtained (Cherry, 2000). The rotations can be between factor pairs at 90 degree angles (orthogonal) or less than or more than 90 degrees (oblique). The rotation employed helps to identify which variables have the strongest loading on a particular factor. If there is an assumption that factors may be correlated, then an oblique rotation is recommended, specifically a promax rotation (Plichta & Kelvin, 2013). A promax rotation is conducted in two-steps: first an orthogonal varmax prerotation, where the extracted factors are uncorrelated, and then a second promax rotation where the orthogonality of the factors is relaxed and they are allowed to be correlated.

Determining the number of meaningful factors to retain in an Exploratory Factor Analysis can be accomplished through several methods. If a principle component analysis is utilized, then eigenvalue or Kaiser criterion can be employed; therefore, any principle component with a eigenvalue of 1.00 or greater is retained. Utilizing this criterion, any component that accounts for less variance than would have been contributed by one variable would not be retained (Hatcher, 2009). In addition, a graphical representation of the eignevalues can be evaluated through a scree plot to assist in determining the number of meaningful factors to retain. By reviewing the scree plot, a logical breaking point between the eigenvalues can be identified (Plichta & Kelvin, 2013). Last, the percentage of the variance in the data set can be utilized to determine how many factors to retain in Exploratory Factor Analysis. Any factor that accounts for 5% or 10% of the common variance is retained. This proportion of variance can be computed by dividing the eigenvalue for a specific factor by the total eigenvalues of the correlation matrix (Hatcher, 2009).

Results of Exploratory Factor Analysis

Exploratory Factor Analysis is widely used in the social sciences to identify underlying patterns in a large group of variables (Plichta & Kelvin, 2013). For this study, the factor structures of the interval variables are Academic Integration (14 total), Social Integration (16 total), Environmental Pull (1 total), Perception of Prejudice and Discrimination (11 total), and Social Capital (10 total) components; a grand total of 52 questions were evaluated. Note one questions was excluded: Social Integration-Living Arrangements was an interval scale, but 97.66% of the responses were in the first category (w2q11). The remaining 52 questions were subjected to an exploratory factor analysis (refer to Appendix A for the range, mean, and standard deviation for each question). The factors were initially extracted through a principle factor method, and this was followed by an oblique (promax) rotation. The scree plot of eigenvalues suggested seven meaningful factors (Appendix B); in addition, this finding is supported by using a cutoff of 5% of the variance and an eigenvalue greater than 1, referred to as the Kaiser Criterion (Field & Miles, 2010; Thompson, 2004). The eignenvalues for each factor are listed in Table 15 in descending order, along with the proportion of varience.

For the behavioral sciences, Exploratory Factor Analysis has been utilized as a data reduction tool and to test validity (Gall, Borg, & Gall, 2002). For this study, two types of validity were utilized to evaluate the constructs of the conceptual model of college student completion. The first is content validity, which examines whether the survey items adequately test the content the investigator wished to measure (O'Sullivan, Rassel, & Berner, 2003). The NLSF was pilot tested in 1998 with freshmen students at the University of Pennsylvania to evaluate the validity of the questionnaire and accuracy of the self-reporting. The pilot study comprised 488 freshmen, which comprised all 130 Black and 98 Latino enrolled students and comparable-sized groups of Asian and White students (Massey et al., 2003). The overall completion rate for the pilot survey was 74%. In general, there was a high degree of reliability in student self-reporting, when respondent's answers to questions were compared to the university registrar records.

Table 15

Eignevalues of the Reduced Correlation Matrix

Factor	Eigenvalue	Proportion (%)	Cumulative (%)
1	4.74420944	28.28	28.28
2	3.57509823	21.31	49.60
3	2.26866212	13.53	63.13
4	1.80793707	10.78	73.90
5	1.58774632	9.47	83.37
6	1.30471025	7.78	91.15
7	1.05817171	6.31	97.46

The second measure, criterion validity, utilizes statistical evidence to establish validity (O'Sullivan et al., 2003). In this study, the use of Exploratory Factor analysis is utilized to evaluate underlying patterns existing within the data set, and whether these subsequent patterns or factors correspond to theoretical components of the conceptual model of the college student completion model. In interpreting the rotated (promax) factor pattern, a criterion of .40 was utilized to identify whether an item loaded on a particular factor. Internal consistency among the multiitem summated rating scale is measured by computing the Cronbach's coefficient alpha (α; Hatcher, 2009). This internal consistency represents the extent to which the individual items in the questionnaire measure the same underlying construct. The seven meaningful factors were identified in the Exploratory Factor analysis, and the coefficient alpha reliability estimates that all exceeded .70, except for Factor 6, for which the alpha score was .68. The interfactor correlations were low to moderate, with the highest level (33) between Factor 1 and Factor 3 (see Appendix C). This association is justified in theory since they both measure the support by friend and family for academic success. In general, the results of the Exploratory Factor analysis support the underlying theoretical constructs of the proposed model for this study. The specific question items and corresponding factor loadings are presented in Table 16.

Table 16

The FACTOR Procedure

Original Variable Code	Original Question	Factor 1 α = .80	Factor 2 α = .81	Factor 3 α =. 78	Factor 4 α = .71	Factor 5 α = .74	Factor 6 α = .68	Factor 7 α = .73
w2q38b	imp to friends: study hard	**.80 ***	-.02	-.03	.01	.02	-.15	-.01
w2q38d	imp to friends: get good grades	**.77 ***	.01	.02	.05	-.07	-.05	-.03
w2q38a	impt to friends: attend cl reg	**.65 ***	-.03	-.04	-.03	.04	-.09	-.02
w2q38f	imp to friends: graduate	**.58 ***	-.02	.08	.10	-.13	-.03	.03
w2q38j	imp to friends: go to grad prof school	**.48 ***	-.01	.19	-.03	.04	.14	.00
w2q38l	imp to friends: be happy	**.43 ***	-.09	.04	.07	-.02	-.02	.16
w2q38p	imp to friends: creat & int study	**.42 ***	-.06	.00	.00	.02	.10	.08
w2q38m	imp to friends: do comm. serv	**.40 ***	.09	-.11	-.08	.13	.23	.05
w2q38o	imp to friends: prac study	.40	.01	.10	-.04	-.08	.25	-.03
w2q38k	imp to friends: do rel activities	.37	.12	-.05	-.13	.10	.15	-.02
w2q38n	imp to friends: have pt job	.32	.11	-.07	-.08	.06	.26	-.11
w2q40	felt self-con b/c of race by profs	.02	**.64 ***	-.01	-.02	.02	-.02	.01
w2q41	felt self-con b/c of race on camp	.00	**.64 ***	.07	-.04	.03	-.02	-.04

(*continued*)

Table 16 Continued

Original Variable Code	Original Question	Factor 1 α = .80	Factor 2 α = .81	Factor 3 α =. 78	Factor 4 α = .71	Factor 5 α = .74	Factor 6 α = .68	Factor 7 α = .73
w2q39	felt self-con b/c of race by studs	.03	**.63 ***	.05	.00	.04	-.01	-.04
w2q46	oth racial probs	.01	**.61 ***	.01	.03	-.03	-.04	-.04
w2q49	dis cl part by prof b/c of race	-.01	**.56 ***	-.01	-.03	-.02	.01	.03
w2q44	racial derogs by profs	-.03	**.53 ***	-.05	.02	-.08	-.06	.09
w2q45	racial derogs by staff	.02	**.52 ***	-.04	.04	-.04	-.02	.05
w2q43	racial derogs by studs	-.01	**.51 ***	.00	.10	-.03	.02	.05
w2q48	unfair grade by prof b/c of race	.00	**.50 ***	-.01	.04	.00	.00	.02
w2q47	rac harass from same race	-.07	**.44 ***	.03	.01	.04	.06	-.02
w2q42	pres id to camp police	-.08	.19	.01	.02	.02	-.01	-.02
w2q32b	having fin. aid probs.	.11	.17	-.06	.06	-.02	.02	-.13
w2q37c	imp to par: get good grades	-.02	.05	**.76 ***	-.03	-.02	-.06	-.07
w2q37b	imp to par: work hard in coll	.02	.00	**.69 ***	.02	.00	-.08	.13
w2q37f	imp to par: go to grad prof school	.00	-.01	**.64 ***	-.05	.13	.09	-.06
w2q37d	imp to par: graduate	.02	.02	**.63 ***	.02	-.09	-.05	.09
w2q37g	imp to par: study some practical	.04	-.02	**.51 ***	.03	-.03	.13	-.16
w2q37a	imp. parents to attend college	-.03	.02	**.42 ***	-.02	-.04	.11	.00
w1q91e	prob: complete grad/prof degree	.03	-.02	.28	-.03	.19	-.04	.07
w1q91c	prob: graduate from college	.04	-.07	.20	.05	.06	-.07	.09
w2q16a	distracted by conversation	.06	.02	.01	**67 ***	-.02	-.06	-.04
w2q16b	distracted by stereo	.07	.01	-.04	**.64 ***	.06	-.06	-.05
w2q16d	distracted by partying	-.06	.04	-.05	**.53 ***	.03	.15	.00
w2q16c	distracted by tv	-.07	.05	.04	**.49 ***	.03	.00	.00
w2q16f	left home to study	-.01	.06	.03	.38	.11	.02	-.05
w2q16e	distracted by fr. going out	-.06	.02	-.02	.37	-.08	.25	.02
w2q23c	ask profs questions after class	-.02	.00	.04	.02	**.75 ***	-.04	.03
w2q23d	see profs in office & ask questions	.02	-.02	.06	.08	**.73 ***	-.02	.01
w2q23b	ask question in lecture	.01	-.04	-.01	.02	**.52 ***	-.04	.05

(*continued*)

Table 16 Continued

Original Variable Code	Original Question	Factor 1 α = .80	Factor 2 α = .81	Factor 3 α =. 78	Factor 4 α = .71	Factor 5 α = .74	Factor 6 α = .68	Factor 7 α = .73
w2q23e	see profs in office & talk	.02	-.01	-.08	.06	**.52 ***	.09	-.01
w1q92	major chosen	-.04	.05	.05	-.06	.15	-.10	.02
w1q91a	prob: finish one year college	.03	.00	.01	.04	-.07	.00	.02
w2q38g	imp to friends:have steady boyf girlf	.04	.02	.02	-.05	.00	**58 ***	-.04
w2q38i	imp to friends: willing to party	-.12	-.04	.05	.16	-.04	**.56 ***	.07
w2q38e	imp to friends: be popular	.05	-.04	.05	.04	-.02	**.54 ***	.00
w2q38c	imp to friends: play sports	.04	.01	-.06	-.06	.05	**.44 ***	-.01
w2q38h	imp to friends: have hang out time	.14	-.09	.03	.15	-.10	**.40 ***	.15
w1qq52l	ly: dad knew who rs friends were	.00	.02	.02	-.05	-.02	-.02	**.67 ***
w1q52l	ly: mom knew who rs friends were	.00	.03	-.04	-.05	.02	.05	**.63 ***
w1q38d	grade 12: p talked with childs friends	.03	.03	-.01	.02	.06	.04	**.59 ***
w2q37h	imp to par:study your interests	.14	-.01	.06	-.04	.03	-.01	.35

* Values greater than 0.4.

The six proposed Conceptual Model of College Student Completion components are Background, Academic Integration, Social Integration, Environmental Pull, Perception of Prejudice and Discrimination, and Social Capital variables (see Figure 3). Background variables were excluded since they were categorical. For the remaining five components, the Exploratory Factor Analysis supported the proposed model's essence.

Academic integration. The concept of Academic Integration was initially subdivided into three categories: Study Habits, Relationship With Faculty, and Major Uncertainty. Study habits included six questions exploring students' ability to remain focused on their studies. Four questions probe relationship with faculty and explore student-faculty interaction. Three questions probe a student's intent to persist in college. These questions employed a 10-point Likert scale (0 = extremely unlikely to 10 = extremely likely). One question under major certainty was omitted because it was measured on a nominal scale.

The Exploratory Factor Analysis results demonstrated four questions with high factor loadings for Study Habits and Relationship With Faculty. Exploratory Factor Analysis supported these constructs with .40 or greater factor loadings, and strong internal alpha consistencies greater than .70 (.71, .74, respectively; see Table 17). For Major Uncertainty, one Exploratory Factor Analysis variable was excluded because it was categorical. The other three questions measuring Major Uncertainty didn't constitute a factor component. Since only one variable would remain as a measurement of Major Certainty, this category was excluded from the revised Conceptual Model of College Student Completion (See Figure 4).

Table 17

Academic Integration—Postfactor Analysis

Original Variable Code	Original Question	Factor Loading
Study Habits (Factor 4)		
w2q16a	I was trying to study, but was distracted by talking or conversation.	.67
w2q16b	I was trying to study, but was distracted by someone playing a stereo.	.64
w2q16d	I was trying to study, but was distracted by someone watching TV.	.53
w2q16c	I was trying to study, but was distracted by friends partying.	.49
		Cronbach's Alpha=.71
Relationship with Faculty (Factor 5)		
w2q23c	Approach professors after class with a question	.75
w2q23d	Meet with your professors in their offices to ask about material you don't understand?	.73
w2q23b	Raise your hand during a lecture when you don't understand something?	.52
w2q23e	Meet with your professors in their offices to talk about other matters?	.52
		Cronbach's Alpha=.74

Social integration. The concept of Social Integration was initially subdivided into two areas: close friends on campus and living arrangements. The support and attitudes of friends and close acquaintances on campus were evaluated through 16 questions, with a 10-point Likert scale (1 = no importance to 10 = utmost importance). Living arrangements was not included in the Exploratory Factor Analysis since it was coded as a nominal variable.

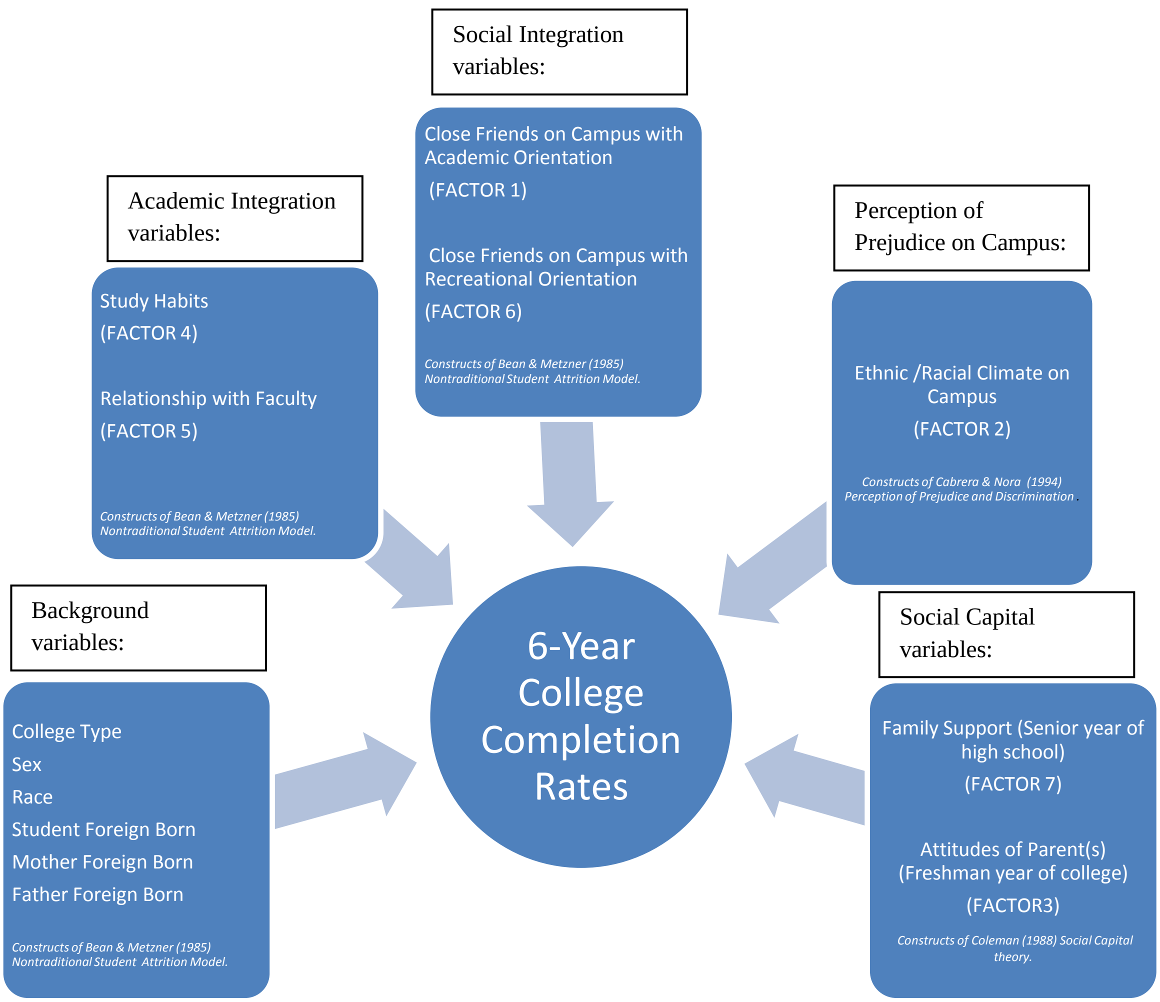

Figure 4. Revised Conceptual model of college student completion

The result of the Exploratory Factor Analysis was the identification of two distinct subgroups of close friends on campus: friends with an academic or recreational focus. These constructs were supported by strong factor loading of .40 or greater, and strong internal alpha consistencies of .79 and .68 (see Table 18). These two subgroups are congruent with the conceptualization of the broader classification of close friends on campus. Therefore, the revised Conceptual Model of College Student Completion includes these two subgroups of close friends on campus (See Figure 4).

Table 18

Survey Items for Social Integration—Postfactor Analysis

Original Variable Code	Original Question	Factor Loading
Close Friends on Campus- Academic (Factor 1)		
	How important is it to your friends and close acquaintances at (College) to:	
w2q38b	Study hard?	.80
w2q38d	Get good grades?	.77
w2q38a	Attend classes regularly?	.65
w2q38f	Graduate from college?	.58
w2q38j	Go on to graduate or professional school?	.48
w2q38l	Be happy and personally satisfied?	.43
w2q38p	Study something interesting and creative?	.42
w2q38m	Do community work or volunteer?	.40
		Cronbach's Alpha=.79
Close Friends on Campus- Recreational (Factor 6)		
	How important is it to your friends and close acquaintances at (College) to:	
w2q38g	Have a steady boyfriend or girlfriend?	.58
w2q38i	Be willing to party, get wild?	.56
w2q38e	Be popular and well-liked by students?	.54
w2q38c	Play sports?	.44
w2q38h	Spend time with friends just hanging out?	.40
		Cronbach's Alpha=.68

Environmental pull. Initially the Environmental Pull variables were to measure elements outside of the college that might impact college attendance. This construct was composed of two areas: lack of finances and a student's work role on campus. A limitation of this construct was each area was measured by only one question. Upon examination of the study results, the nominal measured question measuring the student's work had an extremely high level of missing answers 46.9%. Therefore, since this would leave one question as a measurement of a specific construct, Environmental Pull was eliminated from the final version of the Conceptual Model of College Student Completion (See Figure 4).

Perception of prejudice and discrimination. The concept of perception of prejudice and discrimination was initially explored through six questions examining the ethnic-racial climate on campus, five questions examining the prejudice of faculty and staff, and were measured a Likert scale (1 = never to 5 = very often). The results of the Exploratory Factor Analysis demonstrated a single construct of 10 of the original 11 questions. This construct was supported by strong factor loading of .40 or greater, and strong internal alpha consistencies of greater than .70 (.81; see Table 19).

Table 19

Perception of Prejudice and Discrimination—Postfactor Analysis

Original Variable Code	Original Question	Factor Loading
Ethnic/Racial Climate (Factor 2)		
W2q40	How often, if ever, have any of your college professors made you feel uncomfortable or self-conscious because of your race or ethnicity	.64
W2q41	Walking around campus, how often, if ever, have you been made to feel uncomfortable or self-conscious because of your race or ethnicity?	.64

(*continued*)

Table 19 Continued

Original Variable Code	Original Question	Factor Loading
W2q39	How often, if ever, have student(s) in your college classes ever made you feel uncomfortable or self-conscious because of your race or ethnicity?	.63
W2q46	How often, if ever, have you experienced any other form of harassment on campus simply because of your racial or ethnic group?	.61
W2q49	How often, if ever, have you felt you were discouraged by a professor from speaking out in class because of your race or ethnicity?	.56
W2q44	How often, if ever, have derogatory remarks made by professors about your racial or ethnic groups	.53
W2q45	How often, if ever, have you heard derogatory remarks made by other college staff about your racial or ethnic group?	.52
W2q43	How often, if ever, have you heard derogatory remarks made by fellow students about your ethnic group?	.51
W2q48	How often, if ever, have you felt you were given a bad grade by a professor because of your race or ethnicity?	.50
W2q47	How often, if ever, have you experienced harassment from members of your own race or ethnic group because you interacted or associated with members of some other group?	.44
		Cronbach's Alpha=.81

Social capital. The concept of Social Capital was initially subdivided into two areas: family support (senior year of high school), probed by three questions; and attitude of parents (freshman year of college), probed by seven questions. The questions for family support were measured on a 4- and 5-point Likert scale, and attitudes of parents were measured on a 10-point Likert scale. The results of the Exploratory Factor Analysis demonstrated high factor loadings for all three of the family support questions and all but one question for the attitude of parents. These construct was supported by strong factor loading of .40 or greater, and strong internal alpha consistencies of .73 and .78 (see Table 20).

Table 20

Social Capital—Postexploratory Factor Analysis

Original Variable Code	Original Question	Factor Loading
Family Support (Senior year of high school; Factor 7)		
Age 18	Age 18	
W1qq521	Father (or man most responsible for you) knew who your friends were	.67
W1q521	Mother (or woman most responsible for you) knew who your friends were	.63
w1q38d	Parent(s) (or other adults in your house) talked to your friends	.59
		Cronbach's Alpha=.73
Attitudes of Parents (Freshman year of college; Factor 3)		
	How important is it to your (parents or guardian) that you:	
W2q37c	Get good grades?	.76
W2q37b	Work hard in college?	.69
W2q37f	Go on to graduate or professional school?	.64
W2q37d	Graduate from college?	.63
W2q37g	Study something practical?	.51
W2q37a	Attend college?	.42
		Cronbach's Alpha=.78

Final Conceptual Model

The Exploratory Factor Analysis identified seven distinct factors utilizing 40 of the 52 variables. The proposed Conceptual Model of College Student Completion presented in Chapter 3 (Figure 3), included potentially nine factors. Pursuant to the Exploratory Factor Analysis, the major change in the revised Conceptual Model of College Student Completion is the elimination of the Environmental Pull variables. The revised Conceptual Model of College Student is utilized for the pursuant Logistic Regression analysis (See Figure 4).

Results of Logistic Regression Analysis

The Logistic Regression is the preferred multivariate statistical analysis method for a dichotomist dependent variable. For this study, the dependent variable College Completion is operationalized as 1 = graduated in 6 years and 0 = not graduating in 6 years. The three research questions for this study evaluate the revised conceptual model of College Student Completion as the independent variables, and college completion in 6 years as the dependent variable, utilizing Logistic Regression modeling.

Research question 1. What is the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Hispanic college students?

The Logistic Regression or Logit model utilizes the log odds of the dichotomist dependent variable, college completion to the linear combination of the independent variables in this analysis (Plichta & Kelvin, 2013). Utilizing SAS 9.3 software, the optimizing technique for the parameter estimates is Fisher Scoring. In addition the Descending option was utilized to have the modeling correspond to 1 = graduation in 6 years, so the positive logit regression coefficient corresponds with a positive relations with graduation (SAS, 2012). In SAS, a CLASS statement was utilized to identify the categorical background variables. The statistical significance level for the Logistic Regression model is set at less than or equal to .05

For the 916 Hispanic students selected for the study, 205 were deleted because of missing values (dependent and/or independent variable(s). Therefore, there were 711 Hispanic students included in the Logistic Regression. For the 711 students remaining in the study, 619 graduated college in 6 years, and 92 did not graduated by their 6th year.

The statistical model test includes three comparable chi-square tests evaluating the same null hypothesis, where all the independent variables have a coefficient of zero ($\beta = 0$). The Likelihood Ratio chi-square test calculates the difference between the -2 Log Null model (intercept only) and the -2 Log fitted model (intercept and independent variables). Since the Likelihood Ratio probability was .028 (p-value less than .05), the null hypothesis is rejected. At least one of the Logistic Regression model's β coefficients does not equal zero which implies that at least one of the independent variables is statistically significant (SAS, 2012). The other two chi-square tests (Score & Wald) demonstrated similar results with p values below .05.

The overall goodness of fit of the Logistic Regression Model is calculated by the Hosmer-Lemeshow statistic, and the observed probabilities are compared to those predicted by the Logistic Regression model (Plichta & Kelvin, 2013). The Hosmer Lemeshow is interpreted by a nonsignificant result ($p > .05$), indicating the model appears to fit the data. For the logistic model, predicting college completion in 6 years for Hispanic students, the Hosmer-Lemeshow showed the model is a good fit for the data ($\chi^2 = 5.33$, df = 8, $p > .72$).

R^2 is the statistic that estimates the variance in the dependent variable explained by the independent variables. The R^2 is calculated using the likelihood ratio chi-square to test the null hypothesis stating all coefficients are zero (Allison, 1999). Unlike linear regression, this statistic cannot be interpreted as the proportion of variance, which is explained by the independent variables, because the upper bound is less than one as a result of the discrete dependent variable. In an attempt to correct for this limitation, the Max-rescaled R^2 is also reported, which divides the original R^2 by its upper boundary. For this analysis, the R^2 is 0.03 and Max-rescaled R^2 is 0.06. However, the R^2 results reported in Logistic Regression are low compared to Linear Regression models and can make interpretation problematic. Therefore some researchers don't report these values but instead utilize the Hosmer-Lemeshow statistic to evaluate the model (Allison, 1999; Hosmer & Lemeshow, 2005).

Last, if there are strong linear dependencies between independent variables, multicollinearity can be a problem with Logistic Regression models. Multicollinearity will not affect the coefficients; however, standard errors can be large and impact the effects of the variable (Allison, 1999). By estimating the model using Linear Regression and associated collinearity options, the tolerance and variance inflation factor (the reciprocal of the tolerance) for the independent variables. Low tolerances (<.40) may indicate that multicollinearity is a problem between the independent variables. For this study, all the tolerances were above .50 and the variance inflation factors were below 2.0 (Appendix D), indicating there is not a strong linear dependency among independent variables. Table 21 lists parameter estimates for the Logistic Regression analysis for Hispanic College students.

Table 21

Summary of Logistic Regression Analysis for Variables Predicting 6-Year College Completion for Hispanic College Students

Variable	β	Standard Error	Wald Chi Sq	Pr	Odds Ratio	Confidence Interval (95%)
College (Private-Liberal Arts vs. Public)	0.55	0.24	5.31	0.021*	1.73	1.09-2.75
Sex (Female vs. Male)	0.25	0.24	1.03	0.31	1.28	0.80-2.05

(*continued*)

Table 21 Continued

Variable	β	Standard Error	Wald Chi Sq	Pr	Odds Ratio	Confidence Interval (95%)
Foreign born student (U.S. vs. Abroad)	0.20	0.31	0.43	0.51	1.22	0.67-2.22
Foreign born Mother (U.S. vs. Abroad)	-0.47	0.26	3.22	0.07	0.62	0.37-1.05
Foreign born Father (U.S. vs. Abroad)	0.44	0.27	2.69	0.10	1.55	0.92-2.63
Factor 1-Social Integration: Close Friends on Campus-Academic	-0.12	0.16	0.56	0.45	0.89	0.66-1.21
Factor 2-Perception of Prej: Ethnic/Racial Climate on Campus	-0.02	0.14	0.03	0.87	0.98	0.74-1.29
Factor 3-Social Capital: Attitude of Parents Freshman year in college	0.14	0.13	1.11	0.29	1.14	0.89-1.47
Factor 4-Academic Integration: Study Habits	-0.10	0.14	0.55	0.46	0.90	0.69-1.18
Factor 5-Academic Integration: Relationship with Faculty	-0.07	0.15	0.23	0.63	0.93	0.70-1.24
Factor 6-Social Integration: Close Friends on Campus-Social	0.01	0.15	0.002	0.97	1.01	0.76-1.34
Factor 7-Social Capital: Family Support in HS	0.35	0.15	5.70	0.0169*	1.414	1.06-1.88

*$p < .05$; Wald χ^2 =22.55, p=.03; R^2=.03, Max-rescaled R-square=.06; Hosmer-Lemeshow=5.33, df=8, p=.72

For each independent variable, a coefficient (β or Beta) is listed along with the associated test for statistical significance and confidence intervals. Unlike a linear regression model, the interpretation of the Logistic Regression coefficient is less intuitive because the relationship is nonlinear (Allison, 1999). The Logistic Regression coefficients vary between positive and negative infinity. Therefore, a zero coefficient means the independent variable has no statistically significant effect on the probability of the dependent variable, which is college completion. The independent variables in this study were all coded with a similar ranking, so a positive β coefficient is interpreted as an increase in the log odds that the dependent variable is equal to one (SAS, 2012).

Evaluating the associated odds ratio is recommended to interpret the β coefficient for Logistic Regression. The odds ratio is computed by taking Napier's constant (*e*) the base of the natural logarithm raised to the power of β (Plichta & Kelvin, 2013). The odds ratio, the ratio of one probability to another, is easier to interpret. An odds ratio greater than one can be related to an increase in the odds the dependent variable is equal to one, and vice versa. The percent change in the odds for a 1-unit increase in the independent variable is found by subtracting 1 from the odds ratio and multiplying by 100 (Allison, 1999).

The Wald Chi square associated p value is computed for each coefficient to test the hypothesis that a specific independent variable's coefficient is zero, given the other variables in the model (SAS, 2012). This test statistic is calculated by squaring the ratio of the estimate to the standard error for the independent variable. The independent variables in this model with a statistically significant ($p < .05$) Wald Chi Square are attending a Private-Liberal Arts college ($\chi = 5.31$, $p = .021$) and Social Capital (Family Support in High School; $\chi = 5.70$, $p = .0169$). Further, students with a foreign born mother ($\chi = 3.22$, $p = .07$) or father ($\chi = 2.69$, $p = .10$) had relatively low p values close to the .05 cutoff.

The 95% confidence intervals for the odds ratio in the Logistic Regression model, given the other independent variables in the model, should not include one for statistically significant independent variables. An odds ratio of one indicates the independent variable is not useful for predicting the odds (Allison, 1999). For the independent variables with a statistically significant p (< .05) value, Private-Liberal Arts college and Social Capital (Family Support in High School), the confidence interval lower bounds were both above one.

The odds ratio for Hispanic students that attended a Private-Liberal Arts is 1.73, with a 95% confidence interval of (1.09, 2.75). For Hispanic college students, the odds of completing a college degree in 6 years are 72.9% higher when attending a Private-Liberal Arts college versus a public college.

The odds ratio for Hispanic students with Social Capital, specified as family support in high school, is 1.41 with a 95% confidence interval of (1.06, 1.88). For Hispanic college students, the odd of completing a college degree in 6 years is 41.4% higher if the student receives family support in high school versus not having family support in high school.

Research question 2. What is the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Asian college students?

The Logistic Regression or Logit model utilizes the log odds of the dichotomist dependent variable, college completion to the linear combination of the independent variables in this analysis (Plichta & Kelvin, 2013). Utilizing SAS 9.3 software, the optimizing technique for the parameter estimates is Fisher Scoring. In addition the Descending option was utilized to have the modeling correspond to 1 = graduation in 6 years, so the positive logit regression coefficient corresponds with a positive relations with graduation (SAS, 2012). The statistical significance level for the Logistic Regression model is set at less than or equal to 0.05.

For the original 959 Asian students selected to participate in the study, 112 were deleted from the analysis as a result of missing values (dependent and/or independent variable[s]). Therefore the number of Asian students included in the Logistic Regression model was 847 students. For the 847 students remaining in the study, 765 graduated college in 6 years, and 82 did not graduated by their 6th year.

The Asian students had the highest number of proportion of 6-year college graduates, 90%, compared to Black and Hispanic students. This might account for the Logistic Model lack of fit statistics for the Asian Students. The Likelihood Ration was 0.1553 ($p > .05$); therefore, the null hypothesis that all the independent variables have a coefficient of zero ($\beta = 0$) was not rejected. In addition, the Hosmer and Lemeshow statistic, the observed probabilities are compared to those predicted by the Logistic Regression model (Plichta & Kelvin, 2013), was statistically significant ($\chi^2 = 23.04$, df = 8, $p = .0033$), which can indicate the model does not fit the statistics. However, for this model, there is only one independent variable with a statistically significant Wald Chi-Square.

The R^2 is the statistic that estimates the variance in the dependent variable explained by the independent variables. For this analysis, the R^2 is 0.02 and Max-rescaled R^2 is 0.04. However, the R^2 results reported in Logistic Regression are low compared to Linear Regression models and can make interpretation problematic. Listed in Table 22 are the parameter estimates for the Logistic Regression analysis for Asian College students.

Table 22

Summary of Logistic Regression Analysis for Variables Predicting 6-Year College Completion for Asian College Students

Variable	β	Standard Error	Wald Chi Sq	Pr	Odds Ratio	Confidence Interval (95%)
College (Private-Liberal Arts vs. Public)	0.36	0.25	2.10	0.15	1.43	0.88-2.33
Sex (Female vs. Male)	-0.14	0.25	0.29	0.59	0.87	0.54-1.43
Foreign born student (U.S. vs. Abroad)	0.31	0.25	1.54	0.22	1.36	0.84-2.22
Foreign born Mother (U.S. vs. Abroad)	-0.65	0.40	2.67	0.10	0.52	0.24-1.14
Foreign born Father (U.S. vs. Abroad)	-0.15	0.40	0.15	0.70	0.86	0.39-1.88
Factor 1-Social Integration: Close Friends on Campus-Academic	0.10	0.15	0.41	0.52	1.10	.082-1.48
Factor 2-Perception of Prej: Ethnic/Racial Climate on Campus	-0.22	0.14	2.34	0.13	0.81	0.61-1.06
Factor 3-Social Capital: Attitude of Parents Freshman year in college	-0.10	0.16	0.39	0.53	0.91	0.66-1.24
Factor 4-Academic Integration: Study Habits	0.19	0.16	1.30	0.25	1.20	0.88-1.66
Factor 5-Academic Integration: Relationship with Faculty	-0.10	0.15	0.44	0.51	0.91	0.68-1.21
Factor 6-Social Integration: Close Friends on Campus-Social	0.11	0.17	0.40	0.53	1.12	0.80-1.57
Factor 7-Social Capital: Family Support in HS	0.30	0.15	4.23	0.0397*	1.35	1.01-1.80

*$p < .05$; Wald χ^2 =16.87, p=.16; R^2 = .02, Max-rescaled R-square = .04 Hosmer-Lemeshow = 23.04, df = 8, p = .0033

For this Logistic Regression model, predicting college completion in 6 years, there was one statistically significant independent variable. The independent variable is Social Capital, as defined as Family support during the senior year of high school (Factor 7), Wald statistic (χ = 4.23, p = .0397). Although it was not statistically significant at the $p < .05$ level, having a foreign-born mother was near the cutoff p value (χ = 2.67, p = .10).

The odds ratio for Asian students with Social Capital, defined as Family support during the senior year of high school (Factor 7), is 1.35, with a 95% confidence interval of (1.01, 1.80). For Asian college students, the odds of completing a college degree in 6 years is 35% higher with family support during the senior year of high school (Factor 7), versus not receiving family support during the senior year of high school (Factor 7).

Research question 3. What is the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Black college students?

The Logistic Regression or Logit model utilizes the log odds of the dichotomist dependent variable, college completion, to the linear combination of the independent variables in this analysis (Plichta & Kelvin, 2013). The Descending option was utilized to have the modeling correspond to 1 = graduation in 6 years, so the positive logit regression coefficient corresponds with a positive relations with graduation (SAS, 2012). The statistical significance level for the Logistic Regression model is set at less than or equal to 0.05.

For the original 1,051 Black students selected to participate in the study, 360 were deleted from the analysis as a result of missing values (dependent and/or independent variable[s]). Therefore, the number of Black students included in the Logistic Regression model was 691 students. For the 691 students remaining in the study, 547 graduated college in 6 years, and 144 did not graduated by their 6th year.

The Black students had the lowest number of foreign-born students, 8.32% compared to 31.03% of Asian and 19.45% of Hispanic college students in this analysis. Because of a significant lack of fit in the Black student subgroup model (Hosmer & Lemeshow test, χ^2 = 18.18, df = 8, p = .0.02), it was decided to eliminate the foreign-born variable because of its uneven distribution. This improved the match between expected and observed graduation probabilities for Black students (χ^2 = 8.19, df = 8, p = .42). In addition, the Likelihood Ration was p < .001; therefore, the null hypothesis that all the independent variables have a coefficient of zero (β = 0) was rejected.

The R^2 is the statistic that estimates the variance in the dependent variable explained by the independent variables. For this analysis, the $R^2$is 0.07 and Max-rescaled R^2 is 0.10. However, the R^2 results reported in Logistic Regression are low compared to Linear Regression models and can make interpretation problematic. Listed in Table 23 are the parameter estimates for the Logistic Regression analysis for Black College students.

Table 23

Summary of Logistic Regression Analysis for Variables Predicting 6-Year College Completion for Black College Students

	β	Standard Error	Wald Chi Sq	Pr	Odds Ratio	Confidence Interval (95%)
College (Private-Liberal Arts vs. Public)	0.88	0.30	6.81	0.0091*	2.41	1.62-3.59
Sex (Female vs. Male)	0.64	0.21	9.72	0.0018**	1.90	1.27-2.83
Foreign born Mother (U.S. vs. Abroad)	0.36	0.34	1.09	0.30	1.43	0.73-2.80
Foreign born Father (U.S. vs. Abroad)	-0.75	0.37	4.12	0.0423*	0.47	0.23-0.97
Factor 1-Social Integration: Close Friends on Campus-Academic	-0.18	0.12	2.19	0.14	0.84	0.66-1.06
Factor 2-Perception of Prej: Ethnic/Racial Climate on Campus	-0.02	0.10	0.06	0.81	0.98	0.81-1.18

(*continued*)

Table 23 Continued

	β	Standard Error	Wald Chi Sq	Pr	Odds Ratio	Confidence Interval (95%)
Factor 3-Social Capital: Attitude of Parents Freshman year in college	0.34	0.11	9.10	0.0026**	1.40	1.13-1.75
Factor 4-Academic Integration: Study Habits	0.04	0.13	0.10	0.75	1.04	0.81-1.34
Factor 5-Academic Integration: Relationship with Faculty	-0.04	0.12	0.05	0.82	0.98	0.78-1.22
Factor 6-Social Integration: Close Friends on Campus-Social	-0.06	0.12	0.26	0.61	0.94	0.75-1.18
Factor 7-Social Capital: Family Support in HS	0.21	0.12	2.75`	0.10	1.23	0.96-1.56

*p < .05; **p < .005; Wald χ^2 = 42.85, p < .0001; R^2 = .07, Max-rescaled R-square = .10; Hosmer-Lemeshow = 8.19, df = 8, p=.42

For this Logistic Regression model, predicting college completion in 6 years, there were four statistically significant independent variables. The independent variables with a statistically significant (p < .05) Wald Chi Square are attending a Private-Liberal Arts college (χ = 6.81, p = .0091), Female Sex (χ = 9.72, p = .0018), Foreign-Born Father (χ = 4.12, p = .0423), and Social Capital as defined by Attitude of Parents Freshman year in College (Factor 3; χ = 9.10, p = .0026). It is noteworthy that although it was not statistically significant at the p < .05 level, students with Social Capital, defined as Family support during the senior year of high school (Factor 7), had a p value close to the .05 cutoff, (χ = 2.75, p = .10).

The odds ratio for Black students who attended a Private-Liberal Arts is 2.41, with a 95% confidence interval (1.62, 3.58). For Black college students, the odds of completing a college degree in 6 years are 141% higher when attending a Private-Liberal Arts college versus a public college.

The odds ratio for Black female students is 1.90, with a 95% confidence interval of (1.27, 2.83). For Black female college students, the odds of completing a college degree in 6 years are 90% higher than Black male college students.

The odds ratio for Black students with a foreign-born father was -.47, with a 95% confidence interval of 0.23–0.97. For Black college students, the odds of completing a college degree in 6 years are 112% higher without a foreign-born father versus having a foreign-born father.

The odds ratio for Black students with Social Capital, specified as the Attitude of Parents during the Freshman year in college (Factor 3), is 1.40 with a 95% confidence interval of (1.13, 1.75). For Black college students, the odds of completing a college degree in 6 years are 40% higher if the student receives family support during the freshman year in college versus not having family support during the freshman year in college.

Comparison Between Minority Groups

The three research questions evaluated the factors that affected minority student college degree completion in 6 years within each racial group. In this study, Factor 3 (Social Capital: Attitude of parents freshman year in college) and Factor 7 (Social Capital: Family support in high school) are significant in the main effects. However, it would be beneficial to compare the differences in the seven factors generated by the Exploratory Factor Analysis, between minority groups. Specifically, is there a difference across races in these seven factors, in relation to college completion? This evaluation can be accomplished by utilizing an interaction model in Logistic Regression to compare the seven factors between racial groups and their positive effect on 6-year college degree completion (SAS, 2012). Specifically reference coding was utilized where a level of the classification variable is designated as the reference to which all the remaining variables are compared (Lewis, 2004). For this analysis the variable race was selected and the reference group was Black minority students. In Table 24, the SAS coding for different levels in the variable race is presented. The dummy variables are listed under the column Design Variables, and each row would be inserted into the logit function to calculate the difference in log odds for each Factor (1-7).

Table 24

Class-Level Information

Class	Value	Design Variables	
w1qzeth	Race = Asian	1	0
	Race =Black	0	0
	Race = Hispanic	0	1

The Logistic Regression equation includes all the independent variables included in the original three research questions, with the addition of the interaction term for each of the seven factors. However, it is recommended to focus the analysis on just the interaction terms and not the main effects of this model, unless there is a strong theoretical basis to do otherwise (Hosmer & Lemeshow, 2005). Therefore, the focus of this analysis will be the statistically significant interaction effect between the racial groups by Factor (1-7). The Wald Chi Square test is used with a significance level of alpha = 0.05. The results of this analysis are presented in Table 25. The only statistically significant interaction effect between racial groups is between Black and Asian students on Factor 3, Social Capital, specified as the Attitude of Parents Freshman year in College for Black students ($\chi^2 = 4.33$, $p = 0.04$). In this study, the Black students who observed an increase in Factor 3 (Social Capital- Attitude of Parents Freshman year in College) had a higher odds of graduating in 6 years versus Asian students with the same increase in Factor 3. That is, Black students benefit more from increases in Factor 3 than Asian students.

Table 25

Summary of Parameter Estimates for Interaction Between Racial Groups and the Seven Factors in the Conceptual Module of College Student Completion

Variable	β	Standard Error	Wald Chi Sq	Pr
Factor1* Race(Black vs. Asian) Social Integration: Close Friends on Campus-Academic	0.21	0.19	1.29	0.26
Factor1* Race(Black vs. Hispanic) Social Integration: Close Friends on Campus-Academic	0.03	0.19	0.02	0.89
Factor1* Race(Asian vs. Hispanic) Social Integration: Close Friends on Campus-Academic	-0.19	0.21	0.78	0.38
Factor2* Race(Black vs. Asian) Perception of Prej: Ethnic/Racial Climate on Campus	-0.15	0.17	0.81	0.37
Factor2* Race(Black vs. Hispanic) Perception of Prej: Ethnic/Racial Climate on Campus	-0.02	0.17	0.01	0.92
Factor2* Race(Asian vs. Hispanic) Perception of Prej: Ethnic/Racial Climate on Campus	0.13	0.20	0.46	0.50
Factor3* Race(Black vs. Asian) Social Capital: Attitude of Parents Freshman year in college	-0.39	0.19	4.33	0.04**
Factor3* Race(Black vs. Hispanic) Social Capital: Attitude of Parents Freshman year in college	-0.22	0.17	1.73	0.19
Factor3* Race(Asian vs. Hispanic) Social Capital: Attitude of Parents Freshman year in college	0.17	0.20	0.75	0.39
Factor4* Race(Black vs. Asian) Academic Integration: Study Habits	0.11	0.21	0.29	0.59
Factor4* Race(Black vs. Hispanic) Academic Integration: Study Habits	-0.16	0.19	0.74	0.39
Factor4* Race(Asian vs. Hispanic) Academic Integration: Study Habits	-0.27	0.21	1.63	0.20
Factor5* Race(Black vs. Asian) Academic Integration: Relationship with Faculty	-0.10	0.19	0.28	0.60

(*continued*)

Table 25 Continued

Variable	β	Standard Error	Wald Chi Sq	Pr
Factor5* Race(Black vs. Hispanic) Academic Integration: Relationship with Faculty	-0.06	0.19	0.11	0.74
Factor5* Race(Asian vs. Hispanic) Academic Integration: Relationship with Faculty	0.04	0.21	0.03	0.86
Factor6* Race(Black vs. Asian) Social Integration: Close Friends on Campus-Social	0.23	0.21	1.189	0.28
Factor6* Race(Black vs. Hispanic) Social Integration: Close Friends on Campus-Social	0.10	0.18	0.26	0.61
Factor6* Race(Asian vs. Hispanic) Social Integration: Close Friends on Campus-Social	-0.13	0.23	0.35	0.56
Factor7* Race(Black vs. Asian) Social Capital: Family Support in HS	0.05	0.19	0.08	0.78
Factor7* Race(Black vs. Hispanic) Social Capital: Family Support in HS	0.18	0.19	0.94	0.33
Factor7* Race(Asian vs. Hispanic) Social Capital: Family Support in HS	0.13	0.20	0.40	0.53

Summary

Logistic Regression modeling was utilized to evaluate the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on 6-year college completion rates for minority college students. The result of this extensive analysis has been presented in this chapter, and the social and policy implications will be discussed in the subsequent chapter. It is noteworthy that both factors related to Social Capital are statistically significant in predicting 6-year college completion for each racial group. The concept of social capital follows the theme in the literature that social capital is a concept that has a significant impact on minority students in relationship to college persistence completion.

Chapter Five: Conclusion

This chapter discusses the findings related to successful college degree completion for minority students. First, for each research question, the statistically significant variables are discussed. However, the essence of this study is contained not only in what variables are statistically significant, but also in what variables were not significant in predicting college completion for minority students. Since part of the conceptual model is built upon college completion models studied in a single institution with minimal minority representation, it is expected that some of the variables in the proposed Conceptual Model of College Completion might not be predictive for minority students. Last, implications for policy, practice, and future research are discussed and recommendations proposed.

Dependent Variable—Completion

The percentage of college students that graduates from a college or university is an important benchmark for students and families making decisions on which schools to attend. However, it is noteworthy that this data has only been tracked since the 1990s (Selingo, 2012). Although there continues to be a surge in college enrollment in the United States, college completion rates continue to be lag for most minority groups. Enrollment in degree-seeking programs increased from 11% from 1990 to 2000, to 37% from 2000 to 2010 (NCES, 2011). From 2009 to 2010, Hispanic college student enrollment rose 24% to a record level, and for the first time, Hispanic students outnumber Black students on campus (Fry, 2011). With an increase in student enrollment, there has been a corresponding overall increase in bachelor's degrees awarded. The total number of bachelor's degrees rose 33%

from 2000 to 2010 (NCES, 2011). However, college completion rates have not kept pace for most racial-ethnic groups despite an increase in minority group enrollment. According to the NCES, for first-time degree-seeking students who started in the 2004 cohort, the 6-year bachelor's degree completion rate was 69% for Asian/Pacific Islanders, 62% for Whites, 50% for Hispanics, and 39% for Black students.

However, 4-year college graduation rates are higher at more selective colleges and universities. For the 2004 cohort admitted to institutions with an admission rate of less than 25%, the 6-year graduation rate was 87%; and with an admission rate of less than 49% but greater than 25%, the 6-year graduation rate was 70%. This is similar to this study's results for students attending select colleges and universities where the admission rate ranged from 21% to 54% (see Table 1), and 85% of the minority students graduated in 6 years. Asian students had the highest graduation rate 90%, followed by Hispanic students 86%, and Black students 80%, which also mirrors the national data trends. Other studies demonstrated a similar modest increase in graduation rates at selective institutions and this is attributed to enrolling students with higher academic abilities, better college preparation, higher occupational goal setting, and family resources (Pascarella & Terenzini, 2005). A recent study of students of color attending select universities through the Gates Millennium Scholars program also demonstrated an increase in 6-year graduation rates (Melguizo, 2010). The Gates Millennium Scholars study uses a range of SAT scores to rank the colleges; therefore, an SAT score greater than1,050 was considered very selective to highly selective. Similar to this study, the selectivity of the institution of higher education was denoted by the average SAT score of incoming freshmen, and in this study, the average SAT score was 1,243 (see Table 2). These results are similar in other studies evaluating college degree completion and institution selectivity, as defined by admission SAT scores (Ewert 2012; Titus, 2006b).

Statistically Significant Independent Variables

Research question 1. What is the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Hispanic college students?

In the Logistic Regression analysis, the dependent variable was 6-year college completion, and the independent variables included college type, sex, foreign born, student, mother and father, and the seven meaningful factors from the Exploratory Factor Analysis. For the Logistic model, predicting college completion in 6 years for Hispanic students, the Hosmer-Lemeshow showed the model is a good fit for the data ($\chi^2 = 5.33$, df = 8, $p > .72$). In the Logistic Analysis, only two variables were statistically significant at the $p < .05$ level: College Type attended (Private versus Public) and Social Capital, as defined as family support the senior year of high school.

The Wald Chi Square are attending a Private-Liberal Arts college ($\chi = 5.31$, $p = .021$), and the odds ratio for Hispanic students who attended a Private-Liberal Arts is 1.73, with a 95% confidence interval of (1.09, 2.75). For Hispanic college students, the odds of completing a college degree in 6 years are 72.9% higher when attending a Private-Liberal Arts college versus a public college. This is consistent with the analysis of Pascarella and

Terenzini's (2005) past research studies, where they concluded that unadjusted for students' precollege characteristics, the rate of persistence and degree completion is higher at private colleges.

Similar results were obtained in three recent college completion studies. A Morrison (2012) study examined the graduation rates and institutional characteristics of 428 baccalaureate colleges—377 were private and 51 public schools located in 46 states. The data was obtained through the Education Trust. In this study's results, the odds of graduating from a private versus a public college were 8.96 times higher, holding other variables constant. A second study Melguizo (2008) conducted utilized NCES data for students entering college in 1992, with graduation operationalized as obtaining a bachelor's degree in 8 years. For these students, attending a public institution had a negative impact on degree completion and was statistically significant at $p < .01$. Titus (2006b) examined student-level data from the Beginning Postsecondary Student survey. In this study, the impact of institution level variables on 6-year degree completion for low socioeconomic status student was evaluated. Attending a private university was statistically significant at the $p = .05$ level. Last, an Ishitani (2006) study examined degree completion among first-generation college students in the United States. First-generation student was defined as students with parents who never finished college. Degree completion was defined as 4 to 6 years post-enrollment, and this study utilized data from the National Education Longitudinal Study. There was a statistical difference in degree completion among students attending private versus public colleges.

The reason for a higher degree completion rate at private institutions has been an area of debate. It has been attributed to smaller class sizes, more foundational assets for the students, types of degrees offered, etc. Pascarella and Terenzini (2005) and others contend that a student's precollege characteristics are taken into account; the difference in graduate rates for public versus private colleges is diminished (Bound & Turner, 2010). Astin (2005) contends that graduation rates alone do not take into account the student's academic preparation. Hence, colleges and universities that serve the less prepared student, whether they are minority and/or from a disadvantaged backgrounds, are penalized when only evaluating graduation rates. However, it is interesting that for this study, the minority student met the rigorous academic requirements for these select universities, so these students should be academically prepared for college. Therefore, the argument that the public schools are disadvantaged because of the acceptance of less academically prepared students would not apply in this study. Nevertheless, the Hispanic minority students attending private versus a public college had higher odds of graduating. Future research both qualitative and quantitative may be able to explore what factors at a public college account for this higher graduation rate.

The second statistically significant variable for Hispanic College students in the Logistic Regression model was Social Capital, defined as family support the senior year of high school. The odds ratio for Hispanic students with Social Capital is 1.41 with a 95% confidence interval of (1.06, 1.88). For Hispanic college students, the odd of completing a college degree in 6 years is 41.4% higher if the student receives family support in high school versus not having family support in high school.

In the literature, most studies involving social capital, as defined as parental involvement the senior year of high school, choose to evaluate college degree enrollment or persistence. However, one research group chose to examine social capital and its effect on college degree attainment for minority students. Cerna, Perez, and Saenz (2009) examined how Hispanic college students utilize different forms of social capital to obtain a bachelor's degree in 6 years. This study utilized a longitudinal sample from the Cooperative Institutional Research Program of 4-year degree seeking White and Hispanic freshmen in 1994. These students attended 262 public and private institutions, and the sample included 2,957 Hispanic and 45,889 White college students. The researchers noted that what made their study unique was most social capital theory studies focus on students' decisions to attend or remain in college, but this study utilized degree completion. Social Capital was based on Coleman's (1988) theoretical constructs, and after factor analysis the Social Capital variables included family and parental support to attend college, whether the student lived near college, expectations to participate in community and college organizations, and whether a mentor influenced the college decision. The Logistic Regression equation utilized 6-year college graduation as the dependent variable and evaluated degree attainment between genders for the Hispanic college students. For both genders, components of the Social Capital constructs were statistically significant, specifically, expectation to participate in civic or religious groups on campus, and to attend a college near home. The author commented that by living near campus, students could remain close to family, and this allows students to remain connected to their social and cultural communities.

Other studies examined the positive effect of Social Capital during the senior year of high school related to college enrollment and persistence. A Klasik (2012) study used a multivariate effects logistic model to examine student characteristics, including social and cultural capital and student enrollment. The data utilized was the Education Longitudinal Study, the students were surveyed in 10th and 12th grade, and the students were admitted or enrolled in a 4-year college. The definition of social capital included parents', peers', teachers'-counselors' support to attend, persist, and earn a 4-year degree, and friends' attitudes and plans to attend college. There were 8,960 students in the study: 65% White, 13% Hispanic, 12% Black, and 4% Asian. Hispanic student were less likely than White students to maintain college aspirations from Grade 10 to 12; however, the inclusion of social and cultural capital controls minimized this gap in the analysis. The author noted that sources of social and cultural capital reduced the race and income disparity and improved the probability of college student enrollment for minority students.

Another study that examined how Social Capital has an influence on college enrollment and achievement for Latino and African American males was recently completed. Strayhorn (2010) utilized constructs of Coleman's (1988) theory to operationalize social capital in the form of parents' expectations for high school and beyond degree completion, and students' involvement in organizations on campus, including volunteer opportunities. The dependent variable was academic achievement as measured by grade point average, and the independent variables included background traits, precollege academic preparation, and social-cultural capital. The study utilized the National Education Longitudinal Study that followed a sample of students from eighth grade with a follow up in 1990 (10^{th} grade) and 1992 (12^{th} grade), through the 1st year of college. The sample of 12,150 students was composed of 70% White, 13% Hispanic, 9% Black, and 7% Asian/Pacific Islander. Utilizing Linear Regression modeling, the researcher noted that a student's social (and cultural) capital was significant predictors of undergraduate grade point average for both Latino and Black male students. Parents' positive expectations for degree attainment and attending group activities (especially outreach programs in high school and college) both had positive statistically significant impacts on Latino and Black male college students' grade point average.

There have been other older studies that have also demonstrated the positive effect of Social Capital, as defined as parental involvement in secondary and postsecondary studies and college enrollment and persistence. Perna and Titus's (2005) study utilized the National Education Longitudinal Study data set to examine parental involvement, as conceptualized by the relationship with the parent to student, parent to school, and parent to parent, and college enrollment and persistence. The results supported the supposition that parental involvement was positively related to college enrollment and persistence regardless of school and individual resources.

In Garrison's (2003) study, there was a positive relationship between Coleman's (1988) definition of social capital, operationalized by parental attitudes related to college and parent-student interactions, and the likelihood of college persistence and completion. All racial groups were represented in this longitudinal data collected by the NCES, although 66% of the 8,799 students in the sample were White. However, college completion was a certificate or associate degree, awarded at 2 years, or continued enrollment at 4-years toward a baccalaureate degree (whether they obtained the degree).

As other research studies demonstrated, this study supports prior research studies that show a positive relationship between constructs of Coleman's (1988) Social Capital and college students' degree enrollment and persistence to degree completion, specifically for Hispanic students. The Hispanic culture is supportive of families and the dynamics within a family are grounded in a nurturing environment with a commitment to the family unit. Therefore, it is not surprising that family support and encouragement would have an impact on a student's college enrollment and completion. The goal of administrators is to harness this concept of social capital to enhance college enrollment and degree completion. In addition, since other studies have noted Hispanic parents do not feel as welcome in the secondary schools, administrators need to evaluate what barriers may be present at their facilities. A welcoming and inclusive environment will encourage parents to be active in the schools, and subsequently through this association, they can provide additional support and guidance to facilitate the success of their student.

Research question 2. What is the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Asian college students?

The Asian students had the highest proportion of 6-year college graduates, 90%, compared to Black and Hispanic students. This is consistent with NCES (2011) data that reported Asian-Pacific Islanders had the highest percentage of degrees awarded for any ethnic group at 69%, compared to 62% for Whites, 50% for Hispanics, and 39% for Blacks. The high graduation rate in this study might account for the Logistic Model statistic's lack of fit for Asian students. The Likelihood Ration was 0.1553 ($p > .05$); therefore, the null hypothesis that all the independent variables have a coefficient of zero ($\beta = 0$) was not rejected. In addition, the Hosmer and Lemeshow statistic, the observed probabilities are compared to those predicted by the Logistic Regression model (Plichta & Kelvin, 2013), was statistically significant ($\chi^2 = 23.0418$, df = 8, $p = .0033$), which can indicate the model does not fit the statistics.

Not surprisingly, there was only one independent variable that was statistically significant in the logistic regression model of the Conceptual Model of college student completion. This was the same variable that was statistically significant for Hispanic students: Social Capital, defined as Family support during the senior year of high school (Factor 7), Wald statistic ($\chi = 4.23$, $p = .0397$). For Asian college students, the odds of completing a college degree in 6 years is 35% higher with family support during the senior year of high school (Factor 7), versus not receiving family support during the senior year of high school.

The high college degree completion rate for Asian-Pacific Islanders is often attributed to close family ties and community networking, but the research is limited in this area because of the relatively small numbers of Asian students enrolled at individual colleges and universities (Yeh, 2002; Yosso, 2005). Many studies of college student completion exclude Asian students because of their high persistence and graduation rates and a relatively low sample size compared to other minority groups. A Klasik (2012) study used a multivariate effects logistic model to examine student characteristics, including social and cultural capital and student enrollment, and only 4% of the students were Asian. However, the author noted that although Asian students (as with Hispanic students) were less likely to maintain college aspirations from 10th to 12th grade, the inclusion of social and cultural capital elevated their application and college enrollment to the level of White students.

In Moua's (2007) dissertation study of Asian college students in California, only social capital factors impacting the Hmong students were evaluated. The Hmong population is growing dramatically, but its members' education attainment lags far behind the general population. According to the author, in 2000, the number of bachelor's degrees held on a national level among the Hmong community was 22.7%, and only 27% held a high school diploma. However, this qualitative study also demonstrates support for Social Capital, as defined by social networks for improving the 4-year graduation rate of Hmong college students. Parents who know and understand the education system can be a support and resource for their children in navigating the system and accessing resources. Otherwise, the students are at a disadvantage, and this is reflected in a student comment that his parents were lost in the American society.

It is interesting to note that Social Capital, as defined as family support during the senior year of high school (Factor 7), was a statistically significant variable for both Hispanic and Asian college students in this study. This is supported by other studies that demonstrated that students with parental involvement and other forms of Social Capital have an increased rate of college enrollment, persistence, and graduation (Cerna et al., 2009; Ishitani, 2006; Pascarella & Terenzini, 2005; Perna & Titus, 2005). Both minority cultures have an emphasis on we versus me as a family member, and individual choices are evaluated by how they benefit the family. Other studies have shown a decrease in an Asian student's desire to attend college from the 10^{th} to the 12^{th} grade; therefore, this might be a critical time to provide support and strategies to engage these students in pursuing a college degree. Programs should target not only the student, but also their families on the benefits of a college degree and to help them navigate the system for enrollment, applying for financial aid, etc. Since family support is such an important component, providing opportunities for the entire family to participate would be essential. Utilizing community mentors from a similar ethnic and cultural heritage to serve as role models for these students could be another strategy to engage families and students.

Research question 3. What is the predictive value of background, academic integration, social integration, perception of prejudice and discrimination, and social capital variables on the 6-year college completion rates for Black college students?

The Black students had the lowest number of foreign-born students, 8.32%, compared to 31.03% of Asian and 19.45% of Hispanic college students in this analysis. Because of a significant lack of fit in the Black student subgroup model (Hosmer & Lemeshow test, χ^2 = 18.1776, df = 8, p = .0.0199), it was decided to eliminate the foreign-born variable because of its uneven distribution. This is consistent with the United States Census data for 2010; only 13% of the U.S. population was foreign born, and 53% were from Latin America, 28% from Asia, 12 % from Europe, and only 4% from Africa. By eliminating the foreign-born variable in the Logistic Regression model for Black students, this had a positive impact on the Hosmer Lemeshow Goodness of Fit test (χ^2 = 8.19, df = 8, p = .4148), without impacting any of the β estimates in the model. Therefore the Hosmer Lemeshow is interpreted by a nonsignificant result ($p > .05$), indicating the model appears to fit the data. In addition, the Likelihood Ration was $p < .001$; therefore, the null hypothesis that all the independent variables have a coefficient of zero ($\beta = 0$) was rejected.

For this Logistic Regression model, predicting college completion in 6 years, there were four statistically significant independent variables, the most for any of the minority groups. Therefore it expected that the R^2 is the statistic that estimates the variance in the dependent variable explained by the independent variables for this model is higher (R^2 = .0664, Max-rescaled R^2 = .1036) than for the Hispanic student model (R^2 =.0317, Max-rescaled R^2 = .0591) and Asian student model (R^2 = .0197, Max-rescaled R^2 = .0419). However, the R^2 results reported in Logistic Regression are low compared to Linear Regression models and can make interpretation problematic. Therefore, some researchers don't report these values, but instead utilize the Hosmer-Lemeshow statistic to evaluate the model (Allison, 1999; Hosmer & Lemeshow, 2005).

For the four statistically significant ($p < .05$) independent variables, the Wald Chi Square are attending a Private-Liberal Arts college ($\chi = 6.81$, $p = .0091$), Female Sex ($\chi = 9.72$, $p = .0018$), Foreign-Born Father ($\chi = 4.12$, $p = .0423$), and Social Capital as defined by Attitude of Parents Freshman Year in College (Factor 3; $\chi = 9.10$, $p = .0026$). Each of these independent variables will be examined separately for Black minority students.

For the first statistically significant independent variable, the odds ratio for Black students who attended a Private-Liberal Arts is 2.41, with a 95% confidence interval (1.62, 3.58). For Black college students, the odds of completing a college degree in 6 years are 141% higher when attending a Private-Liberal Arts college versus a public college, and this is higher than for the Hispanic minority student model. These findings are consistent with other studies evaluating minority student college completion studies reviewed previously in research question 1 (Ishitani, 2006; Melguizo, 2008; Morrison, 2012; Pascarella & Terenzini 2005; Titus, 2006b).

For the second significant independent variable, the odds ratio for Black female students is 1.90, with a 95% confidence interval of (1.27, 2.83). For Black female college students, the odds of completing a college degree in 6 years are 90% higher than Black male college students. This is consistent with the effect of gender on degree completion noted in other studies. Kim and Conrad (2006) studied 941 Black freshmen included in the national longitudinal student data set from the Higher Education Research Institute at the University of California, Los Angeles. The researchers used a 9-year follow-up for degree completion for these students of color attending either a Historically Black College (*n* = 401) versus

Historically White University (*n* = 540), and evaluated individual and institutional variable based on traditional student retention models, including Bean (1990). The results of this linear analysis demonstrated that being a Black female was positively related to degree completion with no differentiation between the college types. According to the author, this association between female Black students and degree attainment was similar in a prior study (Kim, Rhoades, & Woodard, 2003).

In a second study, Melguizo (2008) utilized NCES data for students entering college in 1992, with graduation operationalized as obtaining a bachelor's degree in 8 years, and evaluated whether attending select universities had an impact on minority students. Selectivity of the institution was determined by SAT scores, and the Logitic Regression model was utilized to compare student and institutional variables. In this study, being a Black female was statistically significant in relation to college completion. Astin (2005) used a linear regression analysis examining 6-year graduation rates for 56,818 freshman students from 262 baccalaureate-granting institutions, participating in the Cooperative Institutional Research Program. Independent of any other variables, being female was statistically significant; however, this analysis did not include an analysis of gender by racial group. These findings are consistent with the trend from the 1980s of more undergraduate degrees awarded to females than males in the United States (NCES, 2011). In addition, Black males have a lower high school graduation rate than other male minority students; this is a significant issue. Support for the academic success of Black male students must begin in high school or earlier, using mentors from the community to discuss the challenges they faced in school and the benefits from completed a college degree. In a recent study of successful Black male students, the author noted that the most surprising comment by the participants was they had never been asked to discuss their success (Harper, 2012). This may be an opportunity to access this cultural wealth within the community to serve as mentors and supportive of Black male students. Other opportunities to promoting successful college completion for Black males will be explored in this paper.

For the third significant independent variable, the odds ratio for Black students with a foreign-born father was -.471, with a 95% confidence interval of 0.23–0.97. For Black college students, the odds of completing a college degree in 6 years are 112% higher without a foreign-born father versus having a foreign-born father. Earlier studies in the 1990s of first-generation students demonstrated lower college completion rates even after controlling for other variables (NCES, 2005). An Ishitani (2006) study examining degree completion and first-generation college students also demonstrated a similar finding; Blacks were 58% less likely to graduate with a foreign-born parent. It is, therefore, not surprising that not having a foreign-born father would have a positive correlation with degree completion for Black students; however, in the past, most studies have just evaluated the students' immigration status in relation to college completion. This may be a new subdivision of the student-level variables to be included in future studies of first-generation minority students.

Last, for the fourth significant independent variable, the odds ratio for Black students with Social Capital, specified as the Attitude of Parents during the Freshman year in college (Factor 3), is 1.40 with a 95% confidence interval of (1.13, 1.75). For Black college students, the odds of completing a college degree in 6 years are 40% higher if the student receives family support during the freshman year in college versus not having family support during the freshman year in college.

The concept of social capital as an important factor in minority college persistence and degree attainment has been a topic of discussion in the college retention arena (Lin, 1999, 2000; Swail et al., 2003; Yosso, 2005). Recent studies have examined social capital in relation to degree completion. Mertz's (2006) unpublished dissertation study at Seton Hall University examined the role of social capital in degree completion for low income students and students of color: Black and Hispanic. The study utilized the National Survey of Student Engagement and the College Student Report Survey of 12,741 freshman students. The author stated that the samples from both areas resembled the national profile, so the College Student Report Survey was used as a proxy for 6-year graduation rates for the 1997 cohort. The conceptual model included Coleman's (1988) theory of social capital, and 38 questions were utilized to measure Belonging and Inclusion, Recognition and Legitimacy, and Participation (Mertz, 2006). However, the author's definition of social capital focused mainly on interaction on campus and in the community. The results of the linear regression analysis demonstrated that social capital was a positive predictor of college graduation for Black and Hispanic students. However, a limitation of this study was the graduation rates were proxy and not the graduation rates for the students who responded to the survey questions.

Garrison (2003) completed a second unpublished dissertation examining social capital and minority college students at Claremont Graduate University. The students included in this study were 8,799 in the National Educational Longitudinal Study. The dependent variable was continuous college enrollment 3 years after high school graduation. The author utilized Coleman's (1988) and Putnam's (2000) theories to define social capital as family and community support during high school and in college. Utilizing Logistic regression analysis, the study demonstrated a positive predictive of persistence for social capital for all the subgroups, including Black students. The author noted, "This suggests that the more adult support students have the more likely they will persist or complete a degree" (Garrison, 2003, p. 150).

Another recent study examined social capital in terms of the expectation to graduate from college. A Wells, Seifert, Padgett, and Park (2011) study utilized the Educational Longitudinal Study of 14,713 senior high school students across the United States. The dependent variable was whether a student indicated a desire to attain at least a 4-year degree, and the independent variables included tenets of Coleman's social capital theory: parent involvement, parent expectations, and peer influence. The results demonstrated that parental expectations had a positive effect on intent to complete a college degree for all minority students; parental involvement had a positive effect on Hispanic students and peer influence for Asian students' intent to complete a college degree. Also noteworthy is that there was a distinct gender gap: parental involvement had a stronger positive effect for women versus men. The author speculated that this might be a contributing factor to the trend in the United States for women to have a higher rate of degree completion compared to men.

The conceptualization of social capital is fluid in the literature; nonetheless, studies have demonstrated a positive association with social capital and college persistence and degree completion for minority students (Cerna et al., 2009; Eitel, 2007; Mertz, 2006; Moua, 2007). This study is unique because the minority students are attending multiple select universities throughout the United States; therefore, this discounts the argument that minority students don't complete college as a result of a lack of academic preparation. Also, the cultural differences within these minority groups are manifested within the family unit. Although the cultures and customs are different, they have a common characteristic of having strong family bonds. These strong bonds can be utilized to promote minority students' educational attainment in college, and empowering the family members and the community to support the academic achievement. Last, the results of this study have added to the body of knowledge regarding minority college student degree completion, especially in relation to the concept of social capital having a positive impact on minority students.

Nonsignificant Independent Variables

There is knowledge to be gained from all aspects of a research study, both from the variables that are statistically significant and from the variables that are not. In developing the conceptual model for this study, some of the elements were based on traditional college student persistence and completion theories that had been studied primarily with White students, and limited representation of minority students. Therefore, it is expected that some of the variables in this study would not be statistically significant in predicting minority student college completion.

Academic and social integration. The concept of academic and social integration began with Tinto's (1975) work and was later incorporated into the Bean's (1985) Nontraditional Student Attrition model. Tinto (1975) originally hypothesized that a student had to achieve high levels of integration into the academic and social systems of the university in order to achieve academic success and persist in college. Bean's (1985) model incorporated academic and social integration, but in addition included other factors that were to take into account the cultural differences among students (Cabrera et al., 1993; Pascarella & Terenzini, 2005). There have been numerous studies involving college persistence and some other construct to measure either academic or social integration. However Bean and Metzner (2005) recommended that college completion studies would benefit from a longitudinal study involving multiple institutions. Titus (2004) conducted such a study involving constructs of Beans' Module on a National data set of 5,151 students from 384 institutions. The study utilized the Beginning Postsecondary Students longitudinal survey, and the dependent variable was college persistence, as defined by 3 years of continuous enrollment at the same institution. As a proxy of Academic integration, the variables used were grade point average at the end of freshman year, declared major, and living on campus. As a proxy of Social integration, the variables used to measure to construct Involvement were participation in clubs, study groups, fine art activities, lectures, and conventions; going places with friends; social contact with faculty; and talking with faculty outside of class. The study found several of the constructs in Bean's model did positively influence persistence, specifically academic performance and involvement. Although the study included White, Asian, Hispanic, and Black students, its linear regression model did not separate the results by racial group; therefore, it is difficult to make a direct comparison between these results and the results of this study.

Messner's (2008) qualitative study of Black male athletes in four types of institutions examined factors that promoted persistence from 1 academic year. The proxies for academic support were family support, peer support, faculty support, and coach-athletics. The proxies for peer support were teammate support and nonathletic peer support. The four items that did impact persistence were the role of family, the coach, and financial support. A limitation of this study is it only included Black male athletes in only four institutions, and there were a limited number of variables.

Few recent longitudinal studies of minority college student persistence or completion included constructs of social and academic integration; therefore, it is difficult to make a direct comparison with the results of this study (Eitel, 2007; Kim & Conrad, 2006; Melguizo, 2008; Museus et al., 2008; Titus, 2006a; Yazedjian, Toews, & Navarro, 2009). Also, Pascarella and Terenzini (2005) stated that evidence indicates a relationship between student involvement in an institution's academic and social system could be a critical factor in persisting in college. However, the authors noted that few studies include both "academic and social engagement" (p.427), and thus prior studies might "provide an incomplete reflection of the relation between academic and social engagement and persistence" (p. 427), whether direct or indirect. However, because academic and social integration were not statistically significant in this study, it does not totally eliminate their role in college persistence, but there are other factors that might have a greater impact on minority college students' decisions to achieve a college degree.

Perception of prejudice on campus. For this study, the variables utilized to capture the perception of prejudice on campus (Factor 2), were related to the constructs Cabrera and Nora (1994) utilized to evaluate factors impacting students' feelings of alienation. Cabrera et al. (1999) used these measures of students' perceptions of prejudice and racism on campus to evaluate students' decisions to persist 1 year. This study utilized the National Study of Student Learning database, and the sample included freshman students from18 different institutions; 1,139 were White and 315 were Black. The perception of prejudice impact on college persistence exerted only an indirect effect on the student's persistence, and was not statistically significant.

Building upon this research, another researcher utilized a different lens to evaluate the impact of a negative campus racial environment on students of color. In Museus's et al. (2008) longitudinal study, the students' characteristics, including degree completion, were evaluated in relationship to student-perceived racial climate on campus. The study included 8,492 first-time students, attending 2- and 4-year degree colleges. The dependent variable was degree completion, and it was operationalized as obtaining a degree in either 3 (associate's degree) or 6 (bachelor's degree) years. The independent variable Campus Racial Climate was measured by a dichotomist response to students' satisfaction with the racial climate, and mediating variables included academic and social involvement, goal commitment, and institution commitment. The effect of a perceived racial climate on degree completion was mainly indirect (via academic and social involvement, institutional commitment) and not statistically significant, contradicting the Cabrera's et al. (1999) results of. However, Museus et al. (2008) recommended additional studies using other measures of prejudice and discrimination on campus than just a single general indicator.

The results were different in a qualitative research study of Black students attending a large California State University in the Los Angeles area. In this study, the researcher probed by the students' perceptions of the racial climate and whether it impacted the academic opportunities on campus and whether Black students were stereotyped by faculty, staff, and non-Black students on campus (Johnson-Ahorlu, 2012). Students reported that it was psychologically draining and taxing to be treated as inferior on a daily basis. The author summarized the results stating that racism and stereotypes can disrupt the academic opportunities of Black undergraduates and have a negative impact on their ability to achieve in college. Additional research needs to be conducted to evaluate the role of racism and stereotypes on academic performance.

The adverse impact of a campus climate of racism and discrimination on minority student success in college has much support in the literature (Pascarella & Terenzini, 2005). However, the results of this study did not demonstrate a statistically significant relationship between the variables measuring the Perception of Prejudice on campus and degree completion. This might be a result of several factors, including that the type and depth of the variables included in this study were limited to overt acts of prejudice and discrimination on campus. Future studies could include addition measures such as stereotypical threats, responses to prejudice by the minority student, and evaluation of a campus climate of racism and discrimination on minority college students (Ashburn-Nardo & Smith, 2008; Bynum, Burton, & Best 2007; Museus et al., 2008; Reynolds, Sneva & Beehler, 2010).

Implications for Policy and Practice

This decade will prove an exciting and challenging time for educators in the United States, as they strive to achieve President Obama’s goal for 2020 to have the highest number of college graduates in the world (American Association of Collegiate Registrars and Admissions Officers, 2009). The majority of new jobs created in the United States will require more than a high school diploma; therefore, the importance of a college education is imperative for individuals to be competitive in the workplace. In addition a well-trained workforce is essential to promote continued economic growth and achievement in the United States. Another asset is that the United States is becoming more ethnically diverse, but the challenge is the college completion rates have been stagnant for most ethnic groups. The purpose of this study was to add to the current body of knowledge regarding undergraduate student degree completion theory, and thus provide guidance to university policy makers in developing programs that will assist minority students in achieving their goals of obtaining a bachelor’s degree.

The one common thread in this study woven between the minority groups and college degree completion is the concept of social capital. Social capital, as defined by support during secondary or postsecondary school, was a statistically significant variable for each of the three ethnic minority groups in this study. In Bean's (1990) Model of College Student Attrition, he included Environmental Pull variables, and these were described as factors that have a great influence over whether a student persists in college; however, the college has minimal control. Social capital could be another factor to add to this category, since the colleges and universities do not have direct control over a student's source of social capital, but social capital does have a great impact on the student's decision to persist in college. However, a lack of direct control does not eliminate the potential for these institutions to utilize constructs of Social Capital theory to enhance student graduation rates. Based on the results of this study, institutions could implement changes on a secondary and postsecondary level to enhance minority college student enrollment, persistence, and, ultimately, graduation.

Secondary school initiatives. At the secondary school level, this study underscores the importance of familial social capital as a potential predictor of college completion, in particular for Asian and Hispanic students. Policy makers and school administrators could explore ways of including families in the student's achievement in high school and the process for applying for college admission. Interestingly, some researchers report that parents of Hispanic and Black students are met with indifference when trying to participate in school activities, but Asian parents do not encounter this resistance (Oseguera, Conchas, & Mosqueda, 2010). School administrators and teachers need to evaluate how they can empower parents to support the schools and their children in achieving academic excellence, in particular for minority students.

Since families provide support and encouragement for the high school students, the message regarding pursuing a college degree needs to reach students and their families. Students who are the first in their family to attend college are the most disadvantaged, because their families don't have the background information to support adequately their high school students in preparing for college. These students and their families need information prior to starting high school regarding course selection, and achieving a high grade point average and ACT/SAT scores. All of these are important components in preparing a student to become a competitive candidate to apply for college and competing for scholarships. By empowering the student and his or her support group with the information necessary to enroll and fund a college education, there will be more minority students attending college. However, the process by which the secondary schools disseminate information to minority students and their parents and other support groups can vary greatly between school districts. In addition, the effectiveness of these activities vary greatly, especially among rural versus urban school districts, depending upon the resources available.

A recent Stanford University study examined the issue of a deficit of high-achieving, low income students applying to select universities (Hoxby & Avery, 2013). The low-income students that do apply to select universities are disproportionally from 15 large urban areas, where they attended magnet or specialty high schools that encouraged college enrollment. The students outside of these urban areas have access to less information concerning the process of enrollment in select universities and opportunities for scholarships. In addition, there are fewer role models in the schools and the community who attended a select university and would be familiar with the process. The researchers recommend that the outreach activities from these select universities focus on the high achievement, low income students from a broader geographical area. If written content is utilized, it needs to be tailored for these students, highlighting the financial and admission process for students with limited financial resources. Also, alumni from these institutions could hold information session that include students (and their families) from several areas to discuss the benefits of attending a select university, such as that higher graduation rates and with scholarships, the cost could be less than attending a local institution.

Another source of information concerning college enrollment for minority students are the high school faculty and administrative support staff. Faculty members could be encouraged to serve as mentors for students and their parents and to encourage college enrollment. High school counselors could consider whether the message of continued education after high school reaches the student, parents, and other community supporters. In order to reach the parents and support groups for these minority students, other venues could be utilized to disseminate information about postsecondary educational opportunities. Both written and verbal information could be presented in a variety of locations such as libraries, church groups, and community organizations (Hoxby & Avery, 2013). These different venues might provide an opportunity for smaller school systems to combine efforts, and reach families and other community members who could support minority students' efforts to pursue educational goals. This support is critical to minority students' achievement, since studies have documented that the college aspirations of Asian and Hispanic students decrease during high school without this social and cultural support from the community (Klasik, 2012). Another critical area to address in promoting college enrollment and graduation is the widening gender gap among minority groups.

Nationally, there continues to be a trend for gender differences in relation to college completion, and in this study, being a Black female was a statistically significant variable in relation to college completion. A recent national study of Black male student success in higher education highlights the current problems with lower rates of male college enrollment and degree completion (Harper, 2012). In 2008, only 47% of Black males graduated from high school on time and were often less prepared to meet the rigors of a college academic environment. However, this study also evaluated the profiles of more than 200 academically successful Black males in the United States, and the general consensus among the participants was the support they received from parents and the community helped them succeed in school. The author noted that the Black males with strong social capital in the form of parent, teacher, and community support were able to pursue and achieve their goal of a college degree. In addition, the recommendation for improving Black male success in school is high among parental expectations, as is equipping the family with college knowledge, removing financial barriers, and having informed secondary school professionals. These recommendation were also mirrored another report highlighting the disparity in college enrollment and graduation among Hispanic male students (Saenz &

Ponjuan, 2011). It is important that the Black and Hispanic males are not left behind in the pursuit of a college degree. It is forecasted that by 2018, more than 60% of the jobs in the United States will require more than a high school diploma. Therefore it is imperative to reverse the trend of not to obtaining a college degree for minority students and especially male minority students. The message regarding the importance of furthering education needs to be provided early in the secondary school years to all students, especially minority students and male students in particular. The secondary school experience paves the way for the future success of all students to achieve academic success in college.

Postsecondary school initiatives. At the postsecondary level, initiatives to improve college enrollment and completion for minority students could integrate the concept of social capital as another tool to promote degree attainment. In this study, the importance of social capital in the freshman year of college was a statistically significant variable in relation to college completion for Black students; therefore, how can this knowledge be harnessed and applied to promote college persistence and completion at the collegiate level? Family members of minority students may receive a mix message from the media in regard to the negative impact of hyper-vigilant parents of college students. These parents are referred to as helicopter parents because they hover and become too involved with the daily activities of their college children (Goldsmith, 2013). However research involving minority college students and degree completion demonstrate a benefit in the continued support of family and friends while in college (Cerna et al., 2009; Eitel, 2007; Harper, 2012; Mertz, 2006; Moua, 2007). Therefore, colleges and universities could facilitate the healthy inclusion of familial social capital by providing guidelines for family members. Also, information sessions aimed at students' family and community support systems could provide guidance on how to remain connected to the student in a healthy and supportive fashion through technology. For example, the utilization of social media sites could provide a support system to parents of a new college student, and serve as a source of information concerning events on campus. Other researchers have recommended exploring policy initiatives aimed at supporting and enhancing social and other forms capital on campus (Ovink & Veazey, 2011).

Facilitating the growth of social capital both on and off campus, including among family, peers, and community, to support minority college students might involve changes in current campus policies. One recent change has been the utilization of learning communities on campus to improve the peer climate, creating fictive or surrogate kinships for students removed from their community and family support systems. These on-campus learning communities encourage student involvement with peers and with on-campus activities, and have shown an increase in college persistence past the freshman year (Pascarella & Terenzini, 2005). Creating smaller cohesive groups on campus results in similar benefits reported from students attending smaller, private colleges. Some learning communities include faculty interaction in classwork and group activities. Through this collaboration and networking with peers and faculty in a learning community, the student increases his or her social capital on campus (Lin, 2001). Another strategy to provide additional support and guidance for minority college students is the utilization of a freshman seminar.

There is no universal definition of a freshman or first-year seminar experience for college students, but some provide activities the summer prior to admission and continue throughout the freshman year. However, the benefit of such an experience does enhance college student persistence, completion, and satisfaction (Pascarella & Terenzini, 2005). Other researcher recommended such activities, especially for minority students, that include advising and guidance programs (Harper, 2012). For first-generation minority college students who are experience academic or financial difficulties, they need to be aware of the resources available on campus and have a connection to a support system. The utilization of freshman seminars, learning communities, and other initiatives using technology as support are just a few strategies that have been promoted to improve minority student degree completion (Ovink & Veazey, 2011; Strayhorn, 2010; Wells et al., 2011).

Collegiate faculty and staff. The role of faculty and staff didn't have a direct influence on minority college student completion in this study; however, they still can play an important role in promoting student academic success. The faculty and staff at a college can facilitate the student's sense of belonging by their efforts to engage the student, and possibly the family members. In other research, the presence of a faculty mentor has been associated with a greater sense of student belonging and an important motivator for college completion (Harper, 2012; Pascarella & Terenzini, 2005). Especially significant is when the mentor can serve as a role model, having achieved academic success with a similar economic, social, or cultural background as the minority student. Opportunities for mentoring students can occur in the department, through campus organizations, and in the community.

Support staff and academic advisors can be instrumental in supporting the minority student and their families in navigating the educational system. In particular, first-generation minority students and their support groups need to be aware of the resources on campus related to enrollment, financial aid, and other student services (Seidman, 2005). The bureaucracy on any campus can be overwhelming for any student, but these offices on campus need to establish policies and practices that are inclusive to the minority student. In addition, the admission staff can collaborate with secondary school systems to disseminate information regarding enrollment and cost, targeting minority students and their support groups. This can involve activities on or off campus and reaching out to the community to support these students in navigating the seemingly complex system (Pascarella & Terenzini, 2005).

Campus environment. Although the Perception of Prejudice and Ethnic-Racial Climate on Campus factors used in this study were not statistically significant, the impact of an oppressive racial environment cannot be discounted. The variables used to measure the climate of racism on campus might need further evaluation and refinement. Institutions could utilize focus groups and other forums to promote understanding and discourse among the racial-ethnic groups on campus, and to identify areas for improvement. With a greater presence of minority students on all American campuses, the promotion of a campus environment that is harmonious among the diverse student body is a challenge that educators and policy makers need to address. Recommendations include ongoing educational opportunities on campus for faculty and staff to raise their consciousness regarding the diverse racial and cultural environment. In addition there needs to be a method for quantifying the campus climate of racism and prejudice that minority students encounter on campus, so interventions to improve this environment can be evaluated (Minikel-Lacocque, 2012).

Policy makers. During the next decade, academic policy makers face a challenge to increase college degree attainment for all students, and especially for the minority students on campus. This initiative will take planning and evaluation at all levels of the educational process and will be an ongoing activity. In a global economy, it is imperative that the United States has an educated and diverse workforce to compete on an international level. To meet the challenge to increase college graduation rates, in March, 2011, Vice President Biden unveiled a College Completion Tool Kit (U.S. Department of Education, 2011). The purpose of the tool kit is to provide governors with innovative strategies for increasing the number of college graduates on a state level. The federal government will support these initiatives through grants and other funding. In particular, several of the strategies for developing an action plan for improving college completion rates are performance-based funding, accelerate learning, ease the transition for transferring colleges, and utilize data to drive decisions. In the past, it has been difficult and costly to collect longitudinal data regarding college student retention and completion. However, Recovery Act funding requires that each state establish a longitudinal data system, and utilize this information to track and improve for college completion rates in their states. In addition, potential students and their families will have access to this and other data and can use them to make comparisons among colleges.

However, the changes needed to improve college completion rates cannot occur without adequate funding. Both secondary and postsecondary institutions need adequate funding to develop and implement strategies aimed at improving college completion. These financial resources should reward the institutions that focus on the student and assist in the transition into college and, ultimately, degree completion. In addition, minority students from disadvantage backgrounds need access to grants and scholarships to ease the burden of pursuing higher education. Programs aimed at improving retention rates of minority male students at both the secondary and postsecondary level should be a priority for the states and the nation. The college graduates of tomorrow will be the United States' future civic, political, and economic leaders.

Summary

The results of this analysis contribute to the knowledge base regarding minority college student completion theory. In this study, social capital in the senior year of high school and/or freshman year of college had a positive impact on 6-year completion rates for the Hispanic, Asian, and Black minority students. Also, attending a private research or liberal arts college had a positive impact on 6-year completion rates for the Hispanic and Black minority students. Last, being a female or having a native-born father had a positive impact of 6-year completion rates for Black minority students. These are important pieces to the puzzle of why so many minority college students leave college without earning a college degree. Especially in this study, the students were attending academically select colleges and had met the rigorous admission standards for these institutions; therefore, they were academically prepared for college, but some students still failed to obtain a degree. Although this study has added to the theory and understanding of factors impacting minority college student completion, more work in this area is required. Therefore, additional future research is recommended as the United States strives to increase college completion for minority students across the nation.

Implication for Future Research

A college education has a dramatic impact on the individual and society, both economically and culturally. The impact of the changing ethnic landscape in the United States warrants increased attention to the factors that can improve all citizens' academic achievement. The paradox of a recent increase in minority college student enrollment but stagnant graduation rates requires an increase in research factors that can enhance all students' college graduation rates.

There have been few studies that have evaluated minority student college completion within the framework of traditional college retention theories, utilizing multiple institutions and across different racial groups. Although this study adds to the current body of college completion research, addition opportunities for future research abound. Specifically, can this conceptual model, which included components of traditional college persistence-completion theory, perception of prejudice and discrimination on campus, and social capital, be replicated? In addition, the factors in Bean's (1990) Model of College Student Attrition associated with Environmental Pull could not be included in this study of college completion, but they could be incorporated if future studies.

Current research includes the insidious nature of racism on campus and the students' responses and resulting stresses (Ashburn-Nardo & Smith, 2008; Reynolds et al., 2010). It has been postulated that racism on campus is subtle and covert, and is often referred to microaggressions (Minikel-Lacocque, 2012). These microaggressions are intentional or unintentional insults that occur in the student environment and the student might not even be conscious of the daily insults (Minikel-Lacocque, 2012; Reynolds et al., 2010). Therefore, additional studies to evaluate overt and covert measures of a campus climate of prejudice and discrimination would be recommended, especially examining their relation to college student completion. It has been noted that many of the NCES longitudinal data sets could capture this data in its data collection procedures. Then university policy makers could utilize this information to monitor progress in achieving racial harmony and trust on their campuses and evaluate new policy initiatives and compare achievements across institutions. Finally, utilizing a mixed-methods approach would give a voice to the data, and provide a deeper understanding of the effect a climate of racism and prejudice on campus has on minority college students.

Last, there needs to be additional research into social capital and potentially other components of human capital on minority students' graduation rates across the United States. How can policy makers and institutional leaders utilize the tenets of social capital theory to enhance the sense of student satisfaction, well-being, and, ultimately, have a positive impact on college completion? This might require both quantitative and qualitative research to determine the essence of social capital that can positively impact minority college students. How can different initiatives at the secondary level, such as programs promoting college enrollment, college preparatory skills building, developing social networks, etc., be evaluated for effectiveness in obtaining an increase in college graduation rates among minority students? In developing these programs, the results of future research studies will be an invaluable aid in the evaluation and modification of future programs.

The topic of college student persistence and retention has been ongoing during the past several decades. However, the changes in diversity among college student populations coupled with low graduate rates for minority students necessitates the continuation of research and discourse in the arena of college student completion theory. It is imperative that research continue in the area of minority student college completion to guide policy makers and institutional leaders in promoting academic success for all students, especially students of color.

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APPENDIX

Appendix A

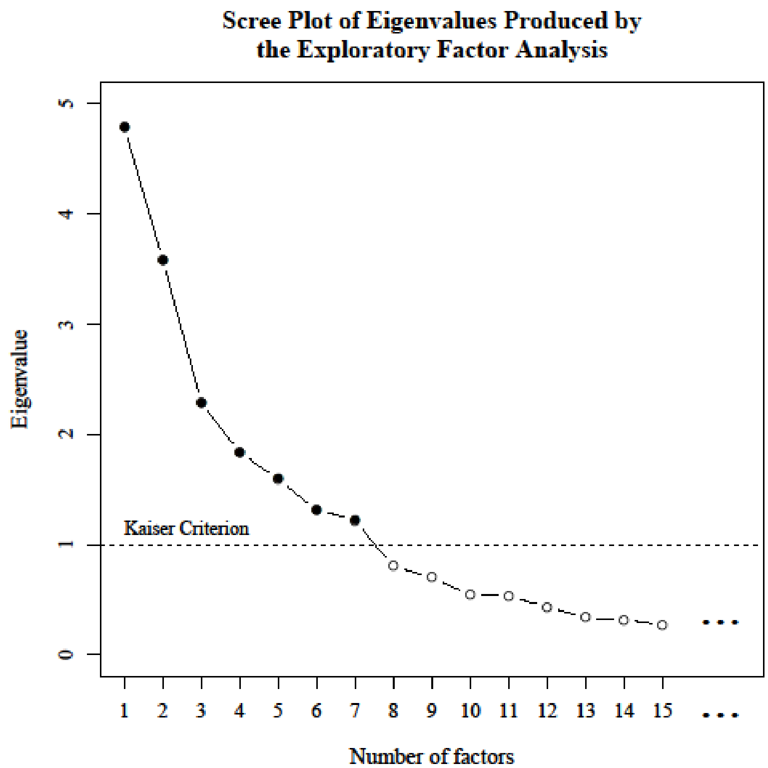
Variables in Exploratory Factor Analysis: Mean, Range, and Standard Deviation

Variable	Original Question	N	Mean	Std Dev	Min	Max
w1q38d	grade 12: p talked with childs friends	2925	3.182906	1.101725	1	5
w1q52l	ly: mom knew who rs friends were	2456	1.9674267	0.9778388	0	3
w1qq52l	ly: dad knew who rs friends were	2873	2.540898	0.7373455	0	3
w1q92	major chosen	2923	0.5600411	0.4964669	0	1
w1q91a	prob: finish one year college	2926	9.923445	0.5580343	0	10
w1q91c	prob: graduate from college	2925	9.7815385	0.7628074	0	10
w1q91e	prob: complete grad/prof degree	2922	8.0366188	2.1909122	0	10
w2q16a	distracted by conversation	2793	5.5173648	2.6792078	0	10
w2q16b	distracted by stereo	2793	3.8836377	2.733978	0	10
w2q16c	distracted by tv	2793	2.2613677	2.5497346	0	10
w2q16d	distracted by partying	2793	2.0680272	2.331044	0	10
w2q16e	distracted by fr. going out	2793	3.8413892	2.5990917	0	10
w2q16f	left home to study	2793	3.688865	3.2123187	0	10
w2q23b	ask question in lecture	2793	3.0383101	2.8255702	0	10
w2q23c	ask profs questions after class	2793	4.3651987	2.7003858	0	10
w2q23d	see profs in office & ask questions	2792	3.7073782	2.7717369	0	10
w2q23e	see profs in office & talk	2793	1.6877909	2.2521681	0	10
w2q32b	having fin. aid probs.	2791	2.3865998	2.9378179	0	10
w2q37a	imp. parents to attend college	2785	6.7824057	2.8337646	0	10
w2q37b	imp to par:work hard in coll	2791	8.9899678	1.608637	0	10
w2q37c	imp to par:get good grades	2791	8.3851666	1.8736951	0	10
w2q37d	imp to par:graduate	2791	9.4536009	1.2859513	0	10
w2q37f	imp to par:go to grad prof school	2783	6.4031621	2.9567729	0	10
w2q37g	imp to par:study some practical	2789	6.6310506	2.9607276	0	10
w2q37h	imp to par:study your interests	2790	7.8544803	2.2102567	0	10
w2q38a	impt to friends: attend cl reg	2787	6.5633297	2.1584383	0	10
w2q38b	imp to friends:study hard	2789	7.3079957	1.9148322	0	10
w2q38c	imp to friends:play sports	2791	3.0555357	2.5895013	0	10
w2q38d	imp to friends:get good grades	2789	7.7984941	1.930161	0	10
w2q38e	imp to friends:be popular	2790	5.0896057	2.4824662	0	10
w2q38f	imp to friends:graduate	2790	9.1677419	1.4995514	0	10
w2q38g	imp to friends:have steady boyf girlf	2787	3.7305346	2.452904	0	10
w2q38h	imp to friends:have hang out time	2789	7.0613123	1.8160092	0	10
w2q38i	imp to friends:willing to party	2790	5.4164875	2.5947821	0	10
w2q38j	imp to friends:go to grad prof school	2783	6.4592167	2.4542632	0	10
w2q38k	imp to friends:do rel activities	2788	4.0322812	2.7753525	0	10
w2q38l	imp to friends:be happy	2790	8.3146953	1.8082812	0	10
w2q38m	imp to friends:do comm. serv	2789	4.2556472	2.4212655	0	10
w2q38n	imp to friends:have pt job	2789	4.0451775	2.6113858	0	10
w2q38o	imp to friends:prac study	2788	5.7546628	2.6490847	0	10
w2q38p	imp to friends:creat & int study	2789	6.8931517	2.2778768	0	10
w2q39	felt self-con b/c of race by studs	2791	1.7760659	0.9002272	1	5
w2q40	felt self-con b/c of race by profs	2791	1.3350054	0.639716	1	5

Variable	Original Question	N	Mean	Std Dev	Min	Max
w2q41	**felt self-con b/c of race on camp**	2789	1.6407314	0.8951513	1	5
w2q42	**pres id to camp police**	2789	1.2538544	0.7261934	1	5
w2q43	**racial derogs by studs**	2790	1.7548387	0.8776557	1	5
w2q44	**racial derogs by profs**	2789	1.1373252	0.4361714	1	5
w2q45	**racial derogs by staff**	2791	1.2142601	0.534767	1	5
w2q46	**oth racial probs**	2790	1.2856631	0.5973908	1	5
w2q47	**rac harass from same race**	2790	1.4433692	0.7771735	1	5
w2q48	**unfair grade by prof b/c of race**	2791	1.1182372	0.4321248	1	5
w2q49	**dis cl part by prof b/c of race**	2791	1.1089215	0.4186032	1	5

Appendix B

Scree Plot of Eigenvalues



Appendix C

Inter-Factor Correlation Matrix

Inter-Factor Correlations

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7
Factor1	100 *	4	33	-8	25	18	17
Factor2	4	100 *	2	14	18	14	-13
Factor3	33	2	100 *	12	4	15	13
Factor4	8	14	12	100 *	2	25	-4
Factor5	25	18	4	2	100 *	9	9
Factor6	18	14	15	25	9	100 *	-1
Factor7	17	-13	13	-4	9	-1	100 *

Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than 0.4 are flagged by an '*'.

Appendix D

Tolerance and Variance Inflation Factors for Independent Variables

Variable	Tolerance	Variance Inflaction Factor
College (Private/Liberal Arts vs. Public)	0.98379	1.01648
Student's Ethnic Group	0.76705	1.30370
Sex (Female vs. Male)	0.92223	1.08433
Foreign born student (US vs. Abroad)	0.87299	1.14549
Foreign born Mother (US vs. Abroad)	0.50840	1.96694
Foreign born Father (US vs. Abroad)	0.50599	1.97634
Factor 1-Social Integration: Close Friends on Campus-Academic	0.68011	1.47036
Factor 2-Perception of Prej: Ethnic/Racial Climate on Campus	0.84987	1.17665
Factor 3-Social Capital: Attitude of Parents Freshman year in college	0.75917	1.31723
Factor 4-Academic Integration: Study Habits	0.81771	1.22293
Factor 5-Acedemic Integration: Relationship with Faculty	0.84643	1.18143
Factor 6-Social Integration: Close Friends on Campus-Social	0.78627	1.27182
Factor 7-Social Capital: Family Support in HS	0.84159	1.18823

Appendix E

Permission for Republication

February 9, 2011

Jennie M. Wagner
2700 Farnborough Rd.
Raleigh, NC 27613

Dear Dr. Douglass Massey,

First, I would like to tell you how much I have enjoyed reading your publications, in particular The Source of the River. My interest in minority college student's attrition rates has provided the catalyst for my doctoral dissertation at N.C. State University; I will be examining Factors that Impact Minority Students Completion Rates. I would like your permission to reprint in my dissertation excerpts from the following:

Massey, D., Charles, C., Lundy, G., & Fisher, M. (2003). *The source of the river.* New Jersey: Princeton University Press.

The excerpts to be reproduced are:

Table 2.5 Sampling plan for National Longitudinal Survey of Freshmen in Selective colleges and universities

Table 2.6 Indicators of institutional quality for colleges and universities in the National Longitudinal Survey of Freshmen

Table 2.7 Refusal and completion rates for full 1999 baseline of National Longitudinal Survey of Freshmen

Table 2.8 Rates of participation in spring 2000 follow-up survey, National Longitudinal Survey of Freshmen

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