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**A Study of the Non-Academic Factors Influencing Four-Year Degree  
Completion among African Americans and Latinos at a Public  
Research University**

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A Study of the Non-Academic Factors Influencing Four-Year Degree Completion among  
African Americans and Latinos at a Public Research University

**by**

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## **Dedication**

This dissertation is dedicated to my wife Linda and my daughter Vanessa. They were the reason and source of motivation for my persistence through graduate school. Linda, this accomplishment simply would not have been possible without you in my life. You have my largest thanks and my love!

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A Study of the Non-Academic Factors Influencing Four-Year Degree Completion among  
African Americans and Latinos at a Public Research University

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The University of Texas at Austin, 2014

Supervisor: Victor B. Saenz

Increasing national emphasis on college completion and affordability has prompted institutional efforts to focus on increasing efficient degree attainment within four-years. Traditional predictors of four-year graduation, Scholastic Achievement Test (SAT) scores and high school grade point average (GPA) may disproportionately negatively impact the enrollment of African American and Latino students who are more likely to receive lower scores on these metrics. This study sought to identify quantifiable non-academic metrics that can assist to predict bachelor's degree attainment in four years for African Americans and Latinos who do not meet typical standardized testing and scoring predictors. A regression analysis was performed on CIRP Freshmen Survey data for University of Texas at Austin students first enrolled in fall 2008 to assess the strength of Freshmen Survey constructs and student-level financial aid to predict graduation within a four-year timeframe. The results showed that the combined consideration of select variables increased the accuracy of prediction by over seven percentage points; moreover, two factors, holding a positive self-concept and likelihood of college

involvement, demonstrated statistical significance within the model. While there are several study limitations, the findings offer support for further exploration of a model for predicting four-year graduation that considers non-academic data elements.



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## **CHAPTER ONE: INTRODUCTION**

### **Introduction**

The national discourse related to higher education is evolving to emphasize college completion and affordability. President Obama has challenged the United States to become the world leader in the percentage of the populace with college degrees by 2020 (Obama, 2009). The federal government has committed nearly \$200 million to achieve this goal through various state-driven performance incentives and persistence to graduation initiatives (Russell, 2011). In addition, private entities, such as the Bill & Melinda Gates Foundation and the Lumina Foundation, have devoted substantial financial resources to encourage persistence research and to fund original programs designed to increase academic success. A presidentially commissioned group of higher education leaders representing a variety of colleges and universities recently published an open letter to compel institutions to adopt the college completion agenda (National Commission on Higher Education Attainment, 2013).

In promoting college completion, President Obama has also called on universities to make degree attainment more affordable (Obama, 2009). Yet, higher education costs are outpacing personal and state funding coffers. The median income of households in the United States has decreased by 7% since 2006 (DeNavas-Walt, Proctor, & Smith, 2012), but the cost of higher education has sharply grown by 18% during that same timeframe (National Center for Education Statistics (2), 2012). State financial appropriations have been reduced by 40% since 1980, and considering this pattern, this funding may be

anemic by 2059 or earlier (Mortenson, 2012). A recent poll conducted by the Carnegie Corporation revealed that nearly 80% of respondents believed the actual benefit of college does not justify the high price of tuition (Sanburn, 2012). Simply put, college has become too expensive.

The juxtaposition of mandates to improve graduation rates and to ease the rapid escalation of costs has prompted institutional efforts to focus on increasing efficient degree attainment within four-years (Powers, 2011). Such an approach may compel university administrators to restrict access for students that have a low probability of receiving a bachelor's degree within this timeframe (DeAngelo et al., 2011; Hossler, 2000). Prior research has confirmed that the most reliable indicators of success are Scholastic Achievement Test (SAT) scores and high school grade point average (GPA) (Astin & Oseguera, 2005; Zwick & Himelfarb, 2011). (Though, it is important to note that the American College Testing (ACT) test has recently become the most widely used test in the United States compared to the SAT, and this new reality has forced an overhaul of the SAT format and test structure (Anderson, 2014).) The higher education institution examined in this study, The University of Texas at Austin, has acknowledged the utility of these metrics as four-year graduation success predictors in admissions and financial aid policies (Diehl, 2012; Musick, 2011).

However, increased reliance on this criterion may disproportionately negatively impact the enrollment of African American and Latino students who are more likely to receive lower scores on these parameters, compared to their Anglo American and Asian peers (National Center for Education Statistics, 2012; Nord et al., 2011; The College

Board, 2012). This is problematic because the university's long-term plan and strategic goals mandate an increase in four-year graduation rates while also preserving the racial/ethnic diversity of the student body (Commission of 125, 2004).

Furthermore, benchmarks that place additional weight on these standardized scores could inadvertently exclude racially-diverse students who are capable of acquiring the skills to persist to graduation. Persistence research has demonstrated that non-academic influences, such as financial aid and institutional programs targeted to first-year students, can positively influence academic success (Lotkowski, Robbins, & Noeth, 2004). Various pre-college student and family characteristics, combined with the college environment and interactions with peers and faculty, can contribute to degree progression (Astin, 1970; Pascarella & Terenzini, 2005; Tinto, 1975). Closely examining these non-academic indicators could increase the accuracy of predicting four-year graduation.

The purpose of this study was to identify quantifiable non-academic metrics that can assist to predict bachelor's degree attainment in four years for African Americans and Latinos who do not meet typical standardized testing and scoring predictors. Research has verified that, while SAT and high school GPA are strong predictors of academic success, non-academic factors can also be used to increase the precision of prediction (DeAngelo et al., 2011; Gore, 2006; Gore (2), 2006; Robbins et al., 2004). Prior studies by Astin & Oseguera (2005) and DeAngelo et al. (2011) analyzed the effectiveness of non-cognitive factors to assess a student's ability to persist. Both projects identified factors on the Freshmen Survey (See Appendix A), administered by the Higher Education

Research Institute at UCLA, that can accurately predict degree attainment at the four, five, and six year intervals for students enrolled at four year non-profit institutions.

The present study utilized data from the Freshmen Survey instrument to determine if there are specific non-academic variables that can increase the accuracy of predicting degree attainment in four years at a major public research university. Data from this instrument has been demonstrated to be effective at measuring the level of academic skills, preparation, and habits among African American and Latino first-generation students (Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007). Early identification of these characteristics could inform admission and financial aid decisions, thereby potentially enabling institutions to simultaneously preserve a racially/ethnically diverse student body while meeting four-year graduation demands.

The remainder of this chapter was intended to provide the background and an overview prior research that is relevant to this study and to the increased emphasis on four-year graduation rates. The impetus for investigating this topic, the purpose of the study, and the methodology utilized are explored in the following sections. Lastly, the limitations associated with this study are discussed.

## **Background**

This study sought to identify predictive factors that may assist institutions to comprehensively evaluate the probability that a student will successfully attain a degree in four years. The need for these forecasting variables is a product of the unique characteristics of internal and external factors that affect the higher education institution

evaluated by this study. This background section summarizes the policy, legal, and political history that has impacted the operations of the school, and it describes how the focus on four-year graduation rates has evolved over time. The review opens with an explanation of the admission and financial aid policies that have contributed to shaping the school's student body. This is followed by an overview of the national and institutional forces that have led to increased oversight and scrutiny of four-year graduation rates, and it concludes with a review of the university's efforts to align institutional programs with the goal to increase timely graduation.

#### **INSTITUTIONAL ADMISSION**

The admissions policies of The University of Texas at Austin (UT-Austin) have evolved over the last few decades. In *Hopwood v. Texas* (1996), the United States Supreme Court ruled that a Law School admissions policy that lowered admissions standards for minority students violated an Anglo American student's equal protection rights provided by the Fourteenth Amendment. As a result, the university was required to remove the consideration of race within admissions and scholarship programs (Burt & Hanson, 2010). The Texas Legislature responded with the implementation of the Top 10% rule, which guaranteed automatic admission to any Texas public college or university for students that graduated in the top 10% of their high school class (Office of Admissions, 2010).

A subsequent decision by the United States Supreme Court effectively reinstated some consideration of race in admissions policies due to the compelling need for diversity (*Grutter v. Bollinger*, 2003). The school, as a result of the *Grutter* decision,

began to consider race as a factor in determining admissibility (Lawyer's Committee for Civil Rights under Law, 2011). Abigail Fisher, an Anglo American student, consequently filed suit against the university, claiming that racial diversity was already being achieved through the race-neutral alternative, the state's Top 10% automatic admission law. The legal challenge to the consideration of race in admissions is currently under review by the United States Supreme Court, and the resulting opinion may again alter the ability of the school to effectively create a student body that reflects the diversity of the state (Sherman, 2012). The sustained legal scrutiny and the forthcoming legal decisions are sufficient motivation for the institution to continue to identify unique methods to sustain racial/ethnic diversity.

#### **INSTITUTIONAL FINANCIAL AID**

Over 60% of students attending UT-Austin require monetary resources to manage to pay for the costs associated with enrollment (T. Melecki, personal communication, March 13, 2014). The Office of Student Financial Services (OSFS) is the central processor of federal, state, and institutional grant, loan, and work-study funds (Student Financial Services, 2011). A total of nearly \$400 million in aid was disbursed to undergraduate students during the 2013-2014 awarding cycle, with a substantial portion paid directly to the institution to cover tuition and housing costs (T. Melecki, personal communication, March 13, 2014). This aid was particularly beneficial to students from the lowest income levels, which were disproportionately represented by African Americans and Latinos. With this in mind, the OSFS is committed to the goal to support the university's efforts to recruit and retain a diverse student body through the promotion

of financial aid awareness and the allocation of financial aid resources to the most economically disadvantaged students (Student Financial Services, 2011).

The current methodology for allocating grants at UT-Austin is based on a packaging philosophy termed Gift Aid Parameter (Student Financial Services, 2011). This approach establishes maximum limits on per student grants in an effort to equitably distribute these funds to a sizeable population. These limits are determined by taking into account the student's Estimated Family Contribution (as determined by the Free Application for Federal Student Aid), grade level, and housing status. The institution's rationale behind considering these factors is that students from the lowest incomes are at most risk to not persist during their first years of enrollment; additionally, front-loading grants minimizes early loan burden that may be difficult to repay should the student not attain a degree (Student Financial Services, 2011). Financial aid is essential to affordability and access at UT Austin; consequently, the impact of this variable must be considered along with other factors examined by this study.

#### **NATIONAL SCRUTINY OF HIGHER EDUCATION**

In August 2011, the United States government received a historic and unprecedented credit rating downgrade from Standard & Poor's financial agency (Goldfarb, 2011). National financial turmoil has provoked renewed scrutiny of higher education institutions; consequently, discourse related to privatization, corporatization, and accountability has been amplified (Fisher & Cohen, 2010). Accountability in higher education is increasingly assigning emphasis on productivity measures, weighting the total cost of faculty salaries against the end results of the number of students taught and

degrees conferred (Merisotis, 2009). Faculty have been criticized for failing to provide an academically acceptable undergraduate education, for participating in research that has no practical utility in society, and for ultimately contributing to rapidly increasing tuition costs (Fisher & Cohen, 2010).

In addition, the general public is becoming progressively cynical of the purpose of and need for a four-year education. A recent poll conducted by the Carnegie Corporation revealed that 84% of public college leaders believe there is too much emphasis placed on attending four-year institutions, and only 26 percent of the general public evaluated critical thinking as an important learning outcome of attending college (Sanburn, 2012). Instead, almost 50 percent of the public interpret the purpose of college to be for the transfer of work-related skills and knowledge (Pew Research Center, 2011). Furthermore, this pessimistic view of higher education is shadowed by an expanding opinion that college is too expensive, and that the actual benefit of college does not justify the high price of tuition (Sanburn, 2012). Those that have borrowed to mitigate college costs tend to assess their loan debt as financially problematic.

A report by the United States Secretary of Education's Commission on the Future of Education provided an assessment of the factors that are influencing expanding higher education costs (Texas Public Policy Foundation, 2008). The committee's analysis identified failure to complete an academic program within a four-year timeframe as a factor that increases costs for both the school and the student (Dickeson, 2006). The report attributed the inability to complete a degree in this timeframe to deficient student academic preparation prior to enrollment. The institutions were also criticized for



creating barriers to on-time graduation, such as the practice of building course schedules based on faculty preferences instead of student needs. This problem is exacerbated when academic advisors lack the skills and qualifications to assist students to navigate procedural obstacles.

### **PRESSURE TO BOOST FOUR-YEAR GRADUATION RATES**

The national dialogue on higher education has drawn the attention of Texas' education leaders. The state's governor has advocated for a variety of reforms to how public colleges and universities function, such as new tenure requirements and accountability measures for faculty (Haurwitz, 2008). The university chancellor has formulated a path for improving institutional efficiency, productivity, and affordability (Cigarroa, 2011). He argued that schools should transform into innovative, nimble, and adaptive organizations; accordingly, he proposed, "A Framework for Advancing Excellence throughout the University System" (Mangan, 2011). The proposal was designed to promote transparency in issues related to efficiency and affordability and to compel all institutions to engage in activities to increase four-year graduation rates. The university responded to the chancellor's directive and conducted an analysis of institutional efficiency and productivity. The study findings clearly demonstrated that the school's faculty is productive, does educate undergraduates, and is a solid financial investment for the people of Texas (Musick (2), 2011).

Despite the value of this school's education, continued oversight and accountability mandated that the university remain committed to identifying and sustaining a variety of cost-savings measures. Similar to the chancellor's

recommendations, the institution's president has suggested that the most effective method for increasing institutional productivity is through the attainment of a more successful four-year graduation rate (Powers, 2011). He established a task force led by the dean of the College of Liberal Arts to identify a plan to achieve a seventy percent success rate. The group concluded that achievement of this benchmark could substantially reduce the number of semesters for which students need to pay tuition and for which the state must provide tuition subsidies; this sort of modification would substantially reduce costs for students and taxpayers. The task force suggested that increasing four-year graduation rates should be a collaborative effort that develops better pathways to graduation, provides incentives for timely completion, and holds students accountable to their degree plans.

The university is also compelled to increase four-year graduation rates as a mandate of the Commission of 125, a strategic vision committee that provided long-term recommendations for the school (Commission of 125, 2004). The group suggested that improving the educational experience could be achieved by limiting the size of the student body through strategic focus on improving four-year graduation rates. They offered University of Virginia's 84% four-year graduation rate as a comparison benchmark to the school's rate of 42%.

The combination of governmental, system, and institutional pressure to improve four-year graduation rates is a priority for the university, and they have initiated a number of modifications designed to improve the standard of completion.

## **INSTITUTIONAL ENROLLMENT MANAGEMENT EFFORTS**

The university has undertaken a comprehensive approach to increase degree completion in four years. A report by the dean of the College of Liberal Arts offered a strategy to implement campus-wide policy and operating reforms consistent with four-year graduation (Diehl, 2012). This strategy is primarily driven by three objectives: enhance the first-year experience and freshmen orientation; modify advising and tracking; and appoint a champion of graduation efforts. These recommendations recognized the importance of ensuring that students receive sufficient academic guidance to enroll in the right classes. Furthermore, the suggestion to appoint a top-level position to coordinate efforts infers that the challenge of four-year graduation encompasses the entire institution.

The dean's report offered recommendations related to financial aid (Diehl, 2012). Specifically, it advocated for increased grant funding to reduce debt burden and to minimize the need for students to work off campus. The university has dedicated funding to support four distinct programs that are intended to support four-year graduation (The University of Texas at Austin (2), 2013). These include: a job success program to promote academic preparation, leadership, and service; a grant award for completing thirty hours in the first semester; a summer bridge program to address pre-matriculation foundational academic deficiencies; and an enrichment grant that can be used for research, internships, or study abroad. Such efforts are novel and offer promise; however, limited university funds restrict the number of students that can be served by these efforts.

The final enrollment management effort is the utilization of historical statistics to make data-driven decisions, such as the allocation of per-student financial aid. These decisions rely on “advanced algorithms to help predict student success in four years, allowing us to identify roadblocks to on-time graduation and find solutions and incentives that encourage students to graduate in four years” (Vice Provost for Enrollment Management, 2013). This study was intended to produce research that might help to ensure that predictors utilized are as robust and accurate as possible, considering the multiple characteristics and behaviors of students.

### **Problem Statement**

The University of Texas at Austin is challenged to identify the correct balance of academic and non-academic characteristics that can inform the enrollment of a racially/ethnically diverse class capable of graduating in four-years. Prior research has validated the use of high school GPA and SAT scores to assess ability to graduate within this timeframe (Astin & Oseguera, 2005; The College Board, 2012; Zwick & Himelfarb, 2011). Also, non-academic pre-enrollment factors have demonstrated accuracy in predicting four-year degree completion (DeAngelo et al., 2011; Gore, 2006; Gore (2), 2006; Robbins et al., 2004), although it is important to investigate if these effects persist when applied to a flagship, four-year public research university in Texas.

The default metrics to gauge four-year graduation at many institutions are SAT scores and high school GPA (Astin & Oseguera, 2005), and these metrics have contributed to UT-Austin’s enrollment management efforts. The method for awarding

discretionary aid has shifted from one that is mostly need-based (Student Financial Services, 2011) to one that includes a merit component that is rooted in standardized academic performance and probability of four-year graduation (Laude, 2013).

Adopting this novel approach to awarding financial aid based on a combination of need and merit standards may increase the enrollment of students that can complete their degree on time; however, this tactic has the potential to inadvertently exclude students that are capable of similar success despite their substandard test scores. This is especially problematic to institutional diversity because African American and Latina/o students do not perform as well as Anglo Americans on standardized tests (The College Board, 2012). Therefore, institutional benchmarks related to access, such as receipt of discretionary financial aid, will disproportionately and systematically exclude students from these ethnic groups.

The university has a compelling need to preserve diversity, considering that the Commission of 125 has mandated that the school continue to recruit and retain a student body that is both economically and racially/ethnically diverse (Commission of 125, 2004). In addition, the core values of the school reflect the importance of diversity (The University of Texas at Austin, 2013). Any decline to racial/ethnic diversity would be a step back for this institution, which continues to struggle with an enrollment that does not reflect the racial composition of the state. The fall 2012 undergraduate class was comprised of 21% Latinos and 4% African Americans while Anglo Americans made up 49% and Asians held 18% of the enrollment (Office of Information Management and Analysis, 2012). In comparison, the most recent United States census data listed the

Texas representation of Latinos at 38%, African Americans at 12%, Anglo Americans at 45%, and Asians at 4% (United States Census Bureau, 2013). There is a clear disparity between the school's enrollment and Texas' ethnic composition. This gap could widen if the United States Supreme Court further restricts the school's consideration of race in admissions policies (Sherman, 2012).

A secondary issue associated with allocating discretionary aid based on four-year graduation probability is that this practice could limit funding to students that rely on such aid to be academically successful. Insufficient aid offers may effectively dissuade enrollment for those students with low four-year graduation predictors; however, those students that still choose to matriculate may be destined to failure without adequate monetary assistance. Financial aid has been shown to have positive effects on persistence (Chen & St. John, 2011), six-year graduation (Titus, 2006), preventing stop-outs (DesJardins, Ahlburg, & McCall, 2002) and socioeconomic diversity (Ehrenberg, Zhang, & Levin, 2006).

#### **THE PROBLEMATIC PATH TO GRADUATION**

There are a number of pre- and post-matriculation variables that make the path to graduation challenging for African Americans and Latinos. From an input perspective, low aspirations (Swail, Cabrera, & Lee, 2004), insufficient or inaccurate college information (Coleman, 1988; Venezia, Kirst, & Antonio, 2003), lack of social capital (Stanton-Salazar, 1997), and inadequate financial resources (Dynarski, 2003; Kim, DesJardins, & McCall, 2009; Paulsen & St. John, 2002) prevent students from

progressing to college, thereby decreasing the base population that could possibly receive a degree.

Also, while research has supported the positive influence of rigorous high school coursework (Engberg & Wolniak, 2010; Warburton, Bugarin, & Nuñez, 2001), such academic preparation is severely limited among underrepresented students (Adelman, 2006, Roderick, Nagaoka, & Coca, 2009). Unfortunately, many of these individuals progress through college with an overarching sense of intellectual insecurity (Rendón, 1994), and others encounter hostility of racism, stereotyping, and bias (Chang, 2000, Farrell & Jones, 1988, Museus, Nichols, & Lambert, 2008, Stotzer & Hossellman, 2011) that complicates academic success (Museus, Nichols, & Lambert, 2008, Nora & Cabrera, 1996) and social development (Hurtado, Carter, & Spuler, 1996).

There are a number of methods by which institutions can assist students to mitigate pre-matriculation challenges. For example, early engagement with faculty, staff, classmates, and friends can stimulate validation, which can positively impact student GPAs and self-confidence (Kim & Sax, 2009; Kuh, Cruce, Shoup, & Kinzie, 2008; Rendón, 1994; Turner, Chandler, & Heffer, 2009). Several theoretical models proposed by Astin, Tinto, and Pascarella all support the importance of in- and out-of-classroom engagement (Pascarella & Terenzini, 2005). Efforts to increase these interactions can promote student learning (Pike & Kuh, 2005) and create a sense of belonging (Meeuwisse, Severiens, & Born, 2010; Ostrove & Long, 2007).

Institutions can cultivate environments that are conducive to learning, engagement, and validation by developing an array of first-year support programs. First-

year seminars create opportunities for more robust, direct interactions with faculty, thereby prompting students to feel more academically challenged and supported (Kuh, 2008). Similarly, learning communities encourage collaborative learning, increase satisfaction, and enhance skills, competence, and knowledge (Zhao & Kuh, 2004). Lastly, mentoring opportunities place importance on fostering individual, person-to-person relationships (Campbell & Campbell, 2007).

Astin, Spady, Pascarella, and Tinto have provided strong theoretical frameworks with which to analyze the complex interaction of an array of environmental, institutional, social, and personal factors that influence degree attainment (Astin, 1999; Pascarella & Terenzini, 2005; Spady, 1971; Tinto, 1975). These theories have been well-supported through a variety of studies that have meticulously examined the dynamic persistence process for underrepresented student populations, and they focus on non-academic factors that are of interest in the present study.

### **Purpose of Study**

The purpose of this study was to isolate non-academic characteristics that can be used to identify students that are capable of four-year graduation success despite their historical low performance on standardized academic measures. In addition, it is important to understand how modifications to financial aid packaging policies may influence the effectiveness of non-academic predictors. This study asked the following research questions:



RQ1: What is the predictive relationship between select Freshmen Survey constructs (e.g. Habits of Mind) and four-year graduation probability among African American and Latina/o students at The University of Texas at Austin?

RQ2: How does the type and amount of financial aid impact the predictive accuracy of select items from the Freshmen Survey on four-year graduation rates for African American and Latina/o students?

The research questions were explored with a quantitative analysis of select factors of the 2008 CIRP Freshmen Survey along with academic and financial data obtained through the Office of Student Financial Services (OSFS). The Freshmen Survey can be analyzed with several existing, well-tested constructs, including: habits of mind, pluralistic orientation, social agency, college reputation orientation, likelihood college involvement, academic self-concept, and social self-concept (Cooperative Institutional Research Program, 2010).

These factors were assessed considering academic success, as defined by degree completion in four years, while also attempting to understand the extent to which the strength of these relationships was influenced by type and amount of financial aid received. The merging of this data is discussed in chapter three. The primary guiding theoretical framework employed in data analysis was Astin's I-E-O model, which proposes that individual pre-matriculation student characteristics combined with environmental factors interact to produce student outcomes that can be analyzed through multivariate analysis (Astin, 1970, 1991). This framework is further explored in chapter two.

Data analysis included descriptive statistics and a correlational analysis to both explore the merged dataset and to validate the presence of relationships between the independent and dependent variables. In addition, because of the dichotomous nature of the dependent variable, a binomial logistical regression analysis was performed to investigate causal relationships while establishing a more robust method to predict four-year graduation success. A more thorough description of study methods is presented in chapter three.

### **Scope and Limitations of Study**

This study was intended to identify particular non-academic metrics, as defined by the Freshmen Survey, which could be used to predict degree completion within four years at a major public research institution. The study was delimited to full-time, first-time freshmen that participated in orientation in summer 2008 and enrolled in fall 2008. There are a variety of limitations regarding what can be inferred from this study and how its findings can be applied to institutions with dissimilar characteristics.

First, this study utilizes a single existing survey mechanism, and as a result, the independent variables evaluated are restricted to that specific tool and do not explore alternative pre-matriculation characteristics. There are other measures that have been used to predict academic achievement, such as the College Student Self-Efficacy Scale, but this instrument has not proven to be significantly accurate at predicting success with pre-matriculation data (Gore, 2006). The Freshmen Survey was selected as the primary instrument due to its existing, well-tested constructs, longevity, and availability of data

specific to the university. Also, the Freshmen Survey is most closely associated with the theoretical model used for this study, Astin's I-E-O model.

A further methodological limitation of this study was that it did not match Freshmen Survey data with the follow-up Your First College Year survey and College Senior survey administered by CIRP. These surveys would typically be used to assess environmental factors in combination with the inputs of the Freshmen Survey. The only environmental factors considered in this study were the type and amount of financial aid. This limitation was necessary because there was an insufficient supply of environmental data for the population being tested. This limitation might have been nominal, considering that prior research that has validated the predictive value of input-only assessments (DeAngelo et al., 2011).

This study was also limited in that it only measured the experience of one institution's students. The university is a Tier-I public research institution that is highly ranked on various higher education assessment lists. The majority of students admitted to the school gain entrance by means of the state's automatic admission law that grants access based on graduating in the top 10% of their high school class (Fisher, 2012), so random assignment was not possible. Furthermore, this school has more costly tuition and living expenses in comparison to lower priced state colleges and community colleges. The findings of this study may lack applicability to less selective and lower priced institutions; nevertheless, the results may inform further studies of similar metrics for a variety of higher education institutions. The last limitation of this study was that

merging data from multiple sources might have resulted in mismatched or incomplete data. The data was analyzed appropriately to minimize these issues.

## **ORGANIZATION**

The next chapter reviewed the literature that has informed the purpose, structure, and research questions of this study. The third chapter outlined the methodological logistics while also further detailing the specific hypotheses associated with the aforementioned research questions. The fourth chapter summarized results of the regression analysis and related statistical procedures. Lastly, the fifth chapter discussed the findings and the implications for research, practice, and policy.

## **CHAPTER TWO: LITERATURE REVIEW**

This literature review was divided into four parts. The first section laid out the historical deficiencies in college access and degree completion for African Americans and Latinos. The second section offered scholarship on the racial disparities and predictors of degree attainment in four years. This was followed by an analysis of the pre- and post-matriculation factors that encourage bachelor's degree attainment. Finally, Astin's I-E-O theory and other relevant theoretical frameworks were presented for this study. This research might provide critical guidance for higher education institutions to develop enrollment management strategies that can simultaneously meet productivity and efficiency demands while also preserving racial/ethnic diversity.

### **Inequality of Higher Education Access and Degree Attainment**

The attainment of a Bachelor's degree has clear benefits for each individual, and the cumulative effects are advantageous to society as a whole. Unfortunately, African Americans and Latinos have historically lagged behind four-year degree attainment. Overall college matriculation and degree attainment rates have experienced historical growth, but ethnically-diverse and low-income students have not been the primary contributor to this expansion (Bailey & Dynarski, 2011). African Americans and Latinos hold fewer degrees of any type than their peers, and the disparity gap between these groups continues to widen (Bailey & Dynarski, 2011; Ryan & Siebens, 2012; United States Census Bureau, 2012).

The sobering reality of educational attainment in the United States is that Latino and African American elementary students have only a 1% and 5% chance, respectively, of graduating from college with a Bachelor's degree (Solorzano, Villalpando, & Oseguera, 2005). There are a number of factors that prevent college access, such as low aspirations (Swail, Cabrera, & Lee, 2004), insufficient or inaccurate college information (Coleman, 1988; Venezia, Kirst, & Antonio, 2003), and inadequate financial resources (Dynarski, 2003; Kim, DesJardins, & McCall, 2009; Paulsen & St. John, 2002).

The rapid expansion of the Latino population is an important challenge considering that the human capital demands require almost thirty-eight million college-educated workers by 2018 (Carnevale, Smith, & Strohl, 2010). In the United States Census, the number of people who identified as Latino increased by 43% between 2000 and 2010, as compared to 12% for African Americans and 1% for Anglo Americans (Humes, Jones, & Ramirez, 2011). The Pew Research Center projects that the Latino population will expand by twenty-five percentage points by the year 2050 while Anglo Americans will decrease by twenty points (Passel & Cohn, 2008). The current demographics of degree attainment and population growth may result in a shortcoming of nearly three million degree-credentialed workers by 2018.

It is also important to note the disparity in degree attainment with relation to gender. Women have historically experienced a variety of obstacles in their pursuit of a higher education, and while they still receive inequitable treatment, they have increased their undergraduate representation in college to the extent that they are now outpacing males (Bailey & Dynarski, 2011). The most recent data from the United States Census

Bureau (2012) showed that female college participation rates are nearly four percentage points higher for African Americans and two percentage points higher for Latinos, compared to White females. Among the college-age population, African American and Latina females held a two percentage point advantage over males in four-year degree programs (United States Census Bureau (1), 2011; United States Census Bureau (2), 2011). This disparity is not unexpected considering that males from these racial groups have higher high school drop-out rates and lower SAT verbal scores, GPAs, class ranks, and number of Advanced Placement (AP) courses completed (Chapman, Laird, Lfill, & KewalRamani, 2011; Nord et al., 2011). Latino males in particular have experienced decreasing presence at both the secondary and postsecondary levels (Saenz & Ponjuan, 2009). The underperformance of African American and Latino males on common predictors of success may be particularly problematic for higher education diversity as colleges increase their reliance on these measures.

The persistent inequity in racial/ethnic diversity of degree attainment, combined with demographic and political shifts in the national landscape, were factors that contributed to the formation of the chief focus of this research project.

#### **FOUR-YEAR GRADUATION INEQUITY**

Rising tuition costs and declining fiscal resources has increased public discourse related to higher education productivity (Panel on Measuring Higher Education Productivity, 2012). A college's productivity has generally been measured considering cost per degree, retention rates, and graduation rates. The majority of degree plans of four-year institutions can be completed within a four-year timeframe, although

completion has traditionally been measured utilizing a six-year timeline (Integrated Postsecondary Education Data System, 2012). Reducing the time to degree to four years directly impacts the cost per degree. Consequently, accountability in higher education has evolved to place greater emphasis on degree completion within four years. For example, The University of Texas at Austin recently created a senior-level administrative position to champion four-year graduation rates (Doolittle, 2012).

This increased emphasis on time-to-degree metrics may be of concern to advocates of campus ethnic/racial diversity, because achieving a degree within four years is more of a challenge for students from underrepresented populations. Bowen, Chingos, and McPherson (2009) analyzed data from multiple federal and private databases (94,000 students) from twenty-one flagship Association of American University (AAU) institutions and 78,000 students from forty-seven state universities. They found that only 49% of all students at flagship schools and 38% of students at state schools complete their degree within four-years.

These proportions are lower when considering racial and economic indicators (Bowen, Chingos, & McPherson, 2009). Evaluating only flagship data, students from the highest socioeconomic status (SES) had a four-year graduation rate that was eight percentage points above the average while the rate for low-SES students was eleven points below the mean. Fifty eight percent in the top income quartile completed in four years, compared to 40% for those from the bottom quartile. Parental education also appears to impact four-year graduation. First generation students had a 39% four-year



graduation rate paralleled with 52% for those students with parents that had attained a degree.

Additionally, the inequality in four-year degree completion is clear when evaluating racial and gender demographics (Bowen, Chingos, & McPherson, 2009). Females, regardless of race, consistently outperform their male peers. There is a thirteen percentage point gap for Asians, sixteen points for Latinos, nineteen points for African Americans, and fourteen points for Anglo Americans. In contrast, an intra-gender analysis revealed noticeable variances on success based on racial classification. For females, Anglo Americans are eleven points more successful at four-year completion than African Americans and eight points higher than Latinos. This disparity is larger among males; compared to Anglo Americans, Latinos are ten points lower and sixteen points worse for African Americans.

#### **PREDICTORS OF FOUR-YEAR DEGREE ATTAINMENT**

Traditional academic measures of success appear to be associated with four-year degree completion. The College Board, the creator of the SAT, has published extensive research to validate the use of their standardized test and high school GPA to predict academic success (The College Board, 2012). In addition, the correlational relationships between achievement and success persist well past the first year. For example, the SAT math score has a .47-.49 correlation with first-year GPA and .48 with fourth year GPA. Those total correlations are listed below:

Table 2.1: Validity of SAT and High School GPA Predictors

	Correlations – 1 <sup>st</sup> year GPA	Correlations – 4 <sup>th</sup> Year Cumulative GPA
SAT Math	0.47 – 0.49	0.48
SAT Critical Reading	0.48 – 0.50	0.51
SAT Writing	0.51 – 0.53	0.54
SAT (CR, M, W)	0.53 – 0.56	0.56
High School GPA	0.54 – 0.56	0.56
SAT + High School GPA	0.62 – 0.64	0.64

Moreover, a study conducted by Astin and Oseguera (2005) analyzed data for about 57,000 students from 262 four-year institutions. Four-year completion rates for students with high school grade point averages of A ranged from 47.1% to 58.2%. In comparison the range for B was 19.2% to 35.4% and 8% to 14.6% for C or less. The SAT composite score was shown to be positively correlated with four-year graduation. Students with SAT scores of 1300 and above, 1200 to 1299, and 1100 to 1199 achieved a 62.3%, 55.2%, and 48% success rate, respectively. In comparison, students that scored from 1000 to 1099, 900 to 999, and 800 to 899 achieved only a 40%, 30%, and 22% rate, respectively.

These findings are important because students from ethnic minority groups tend to perform lowest on these particular metrics. The average high school grade point average in 2009 for African Americans was 2.69 and 2.84 for Latinos, much lower than 3.09 for Anglos and 3.26 for Asians, and this disparity was even greater when

considering gender (Nord et al., 2011). African American women averaged 2.79 compared to 2.57 for men, and Latina women achieved a 2.91 GPA in comparison to 2.75 for men. Additionally, Latinos and African Americans achieved substantially lower scores than Anglos on all three measures of the SAT test (National Center for Education Statistics, 2012). The disparity is consistently around 100 points for African Americans and about 75 points for Latinos. The combination of the importance of GPA and SAT scores in predicting four-year graduation and the consistent underperformance of African Americans and Latinos raises a concern that these underrepresented populations will begin to lose access to higher education institutions with stringent admissions criteria. As such, it is imperative to identify alternative methods as proxy for predicting time to degree.

A study conducted by the Higher Education Research Institute attempted to identify non-academic success predictors (DeAngelo et al., 2011). Their analysis examined over 210,000 students at 356 higher education institutions using data from the 2004 CIRP Freshman survey. They considered only information contained on this survey, and they did not include post-enrollment characteristics. The results of a logistical regression analysis revealed that a variety of pre-college non-academic variables were effective at predicting degree attainment at four, five, and six years. These findings offer promise that forecasting can be determined by more than just standardized scores.

## **Factors Influencing Completion**

Progressing to postsecondary education for underrepresented students is often a departure from family tradition, and involves complex academic, social, and cultural transitions (Terenzini et al., 1994). There are a variety of pre- and post-matriculation factors that influence persistence and degree attainment. Each variable described in the subsequent sections has been demonstrated to have an influence, positive or negative, on successful degree attainment. These variables have been used to inform the selection of this study's independent variables.

### **DIFFERENCES IN COLLEGE PREPARATION**

Pre-matriculation adversity frequently prevents college access. On the other hand, many students overcome these obstacles, but they arrive on campus with incomplete pre-college preparation. African Americans and Latinos have low college attendance aspirations, with only 41% and 36%, respectively, expecting to attend college (Swail, Cabrera, & Lee, 2004). Matriculation is inhibited by inadequate parental engagement, inaccurate or incomplete college attendance information, delayed enrollment, and poor high school-to-college social networks (Bozick & DeLuca, 2005; Perna & Titus, 2005; Roderick, Coca, & Nagaoka, 2011; Venezia, Kirst, & Antonio, 2003).

Social capital theory highlights the importance of information channels and social relations as mechanisms to provide individuals with the opportunity to take a specific action (Coleman, 1988). Regrettably, low-status students have insufficient social capital to obtain the necessary information to make the transition from high school to college. These students are often devalued by society because of their social class, ethnicity, and

gender; also, structural barriers contribute to uncomfortable interactions with unfamiliar social networks (Stanton-Salazar, 1997). Distrust and detachment are normalized in a manner that prevents lower status students from attempting to break through to a higher social network. Students who persist to college despite these barriers remain at a disadvantage when they arrive on campus, and they are less prepared to navigate the demanding and novel college environment.

### **ACADEMIC COLLEGE READINESS**

Academic preparation in high school, often labeled college readiness, contributes to degree attainment. College readiness is a multidimensional series of factors that affect an individual's ability to succeed in a college environment (Conley, 2008). These factors include cognitive strategies such as problem solving, accuracy, reasoning, and research; also, academic behaviors should promote self-awareness, self-monitoring, and self-control. College readiness is often measured by higher education institutions through consideration of grade point averages, coursework completed, and standardized test scores; in addition, it includes academic knowledge and skills that are acquired through a variety of classes including math, English, social studies, languages, science, and arts (Conley, 2008; Roderick, Nagaoka, & Coca, 2009).

The probability of completing the requirements to receive a four-year degree is higher for students who were challenged with rigorous high school coursework (Warburton, Bugarin, & Nuñez, 2001). A study by Engberg and Wolniak (2010) revealed that the highest level of math taken, total courses taken, and final high school grade point average significantly and positively impacted degree completion at a four-year

institution. High school students that complete four years of math, science, and English have an 87% persistence rate (Warburton, Bugarin, & Nuñez, 2001).

Unfortunately, many students fail to exhibit the college readiness characteristics defined above. Nearly half of high school students spend less than three hours per week studying; in comparison, the majority of college students accumulate over ten hours per week in study time (McCarthy & Kuh, 2006). Only 53% of the high school students revealed that they put forth their full effort in projects while only 35% were excited about their classes. A total of 80% of students indicated they spent less than three hours per week reading, 78% of seniors reported writing less than four papers total, and 49% of seniors did not enroll in a math course. Failing to complete courses such as Lab Science and Algebra II can have the effect of delaying a student's transition to college directly after completion of high school (Goldrick-Rab & Han, 2011).

Lack of college readiness is even more disconcerting when analyzed considering economic and racial demographics. Students from the lowest socioeconomic backgrounds were less likely than their high socioeconomic peers to attend high schools that offered advanced math classes above Algebra II; enrolling in an advanced math class is a strong predictor of college success (Adelman, 2006). Additionally, there was a 7 percent gap in 2005 between Anglo American and Latino completion of mid-level curricula (Roderick, Nagaoka, & Coca, 2009). Latinos and African Americans scored 29% lower than Anglos in 2004 on reading scale scores; they also received 24% and 28% lower scores, respectively, on the mathematics scale.

Furthermore, both groups completed fewer advanced placement (AP) tests in math and science, and they completed less AP and international baccalaureate classes (Roderick, Nagaoka, & Coca, 2009). In addition, females of these racial groups outperformed males in the number of AP courses taken by 47% for African Americans and 19% for Latinos. Bearing in mind these metrics, only 20% of Latinos and 23% of African Americans were considered college ready, compared with 40% of Anglo Americans. Latinos and African Americans enter college academically underprepared; however, they must compete and interact with peers who have had robust preparation. This disparity may prompt students to seek to validate their ability to sustain the academic rigors of college work inside and outside of the classroom.

#### **VALIDATION**

Underrepresented students are particularly prone to pursue validating experiences that can confirm their capacity to be academically successful in a challenging higher education environment. College students commonly encounter prevailing peer and faculty tendencies to classify racial minorities and first-generation students as intellectually inferior or academically unqualified (Rendón, 1994). This self-image of weakness is molded through the perception of faculty indifference and the belief that they are defined as only a number in the classroom. Moreover, African Americans and Latinos are more likely than Anglo Americans to feel degraded by classroom interactions, and they are more likely to benefit from exchanges that validate their ability.

Validation of educational capacity positively influences students by increasing their confidence in their ability to learn and their feelings of self-worth (Rendón, 1994).

In addition, self-efficacy is positively associated with academic success through increased grade point averages (Turner, Chandler, & Heffer, 2009). Validating experiences occur in class through interaction with faculty, teaching assistants, and classmates; out-of-classroom validation stems from relationships with significant others, friends, staff, and family members. Validation through parental support is particularly beneficial to those students who are racial minorities or first-generation (Dennis, Phinney, & Chuateco, 2005). Parental and family assistance can also contribute to alleviating stress related with the transition to college (Terenzini et al., 1994). In some instances, Latino students actually use past experiences of being told they will not succeed as motivation to persist (Cavazos, Johnson, & Sparrow, 2010).

Validation prevents students from disengaging from the activities that will contribute to academic success. Consequently, it is imperative for colleges to create opportunities for students to engage in validating experiences. This type of engagement is particularly effective during the freshman year (Rendón, 1994).

## **ENGAGEMENT**

Engagement is a method that can promote validation in addition to providing other important benefits. Several foundational theories in persistence research support the importance of engagement. Astin's theory of involvement submits that students learn by becoming involved; in addition, his input-environment-outcome (I-E-O) model suggests that the outcomes of college enrollees are influenced by the environment they experience on- and off-campus through contact with people, programs, policies, and cultures (Pascarella & Terenzini, 2005). Similarly, Tinto's theory of student departure advocates



that interactions with the structures and members of the institution will continually modify the characteristics with which students entered college. Affirmative connections to the school environment will positively impact the extent of individual student integration. Finally, Pascarella's general model for assessing change proposes that the structural and organizational characteristics of the institution influence the quality of interactions with faculty and peers; learning and cognitive development is enhanced when these relationships are strong.

These theories have been repeatedly reaffirmed and supported by additional research. For example, engagement through living on-campus strongly reinforced increased student learning outcomes (Pike & Kuh, 2005). Both informal and formal teacher and peer interactions were discovered to create a sense of belonging for all students within the learning environment and lead to academic progression (Meeuwisse, Severiens, & Born, 2010). In addition, student collaboration with faculty on research-related projects can promote improved grade point averages (GPA) and higher degree aspirations for students of all genders, ethnicities, and income levels (Kim & Sax, 2009).

The importance of engagement has been confirmed when evaluating socioeconomic and racial demographics. A sense of belonging promotes academic success for students from low socioeconomic backgrounds (Ostrove & Long, 2007), and it indirectly increases expectations and incidence of persistence among both Anglo Americans and African Americans (Hausmann, Ye, Schofield, & Woods, 2009). Formal faculty and student interactions prompt academic success for African Americans and Latinos, while course-related communications enhance critical thinking, increase

satisfaction, and result in higher GPAs for Latinos, but not for African Americans (Kim & Sax, 2009). African Americans most commonly interact with faculty on issues related to the course instead of those related to research. In addition, they more often seek the guidance of other African American professors; these faculty are perceived as realistic role models, less likely to racially stereotype students, and more likely to provide career, academic, and personal advising (Guiffrida, 2005).

First-generation college students tend to be engaged to a lesser extent in the educational environment than those students who have a parent with college experience (Pike & Kuh, 2005). They less frequently assist with research for course credit, communicate with faculty outside of class, and participate in conversations with the professor during class, compared to their non-first-generation peers (Kim & Sax, 2009). Frequency of communication is greater among higher social class levels, and minority and first-generation students gain less satisfaction with faculty interactions than their Anglo American and non-first-generation peers.

The efficacy of student engagement is theoretically supported in research, and it appears to be reinforced by actual outcome measures. Student engagement in meaningful educational activities strengthens first-year grade point averages, thus stimulating first-year retention (Kuh, Cruce, Shoup, & Kinzie, 2008). Data from the National Survey of Engagement of eighteen colleges and universities confirmed that prior academic achievement, measured through SAT or ACT performance, had the strongest influence on first-year GPA. However, students who had not performed well on these predictive measures were able to achieve similar first-year success when they were engaged through

activities such as living on campus, full-time enrollment, and working on campus. This result is especially promising for low-income ethnic minorities who tend to receive low high school GPAs and SAT scores.

In summary, engagement activities can be beneficial in assisting students to mitigate pre-college shortcomings that can prevent successful degree attainment, and this is particularly the case for underrepresented students. A component of this study was intended to measure the extent to which students would be likely to participate in such engagement activities.

#### **RACISM, STEREOTYPING, AND BIAS**

Validation and engagement can positively influence degree attainment; regrettably, racially insensitive or hostile school environments may prevent connections to these developmental processes. Acts of racism and stereotyping have persisted on college campuses; although it is possible that these unfortunate acts have evolved to be less perceptible and explicit (Chang, 2000). Latino and African American students generally experience high levels of dissatisfaction with the racial climates of their campuses (Museus, Nichols, & Lambert, 2008). Institutions that enroll low African American and Latino populations report more incidents of hate crimes (prejudice based on race, religion, sexual orientation, or ethnicity) than those with high minority enrollments (Stotzer & Hossellman, 2011). Racial incidents are prominent at campuses that lack minority support programs, diversity initiatives, and ethnically diverse faculty and staff (Farrell & Jones, 1988).

Students of color who experience high levels of discrimination on campus are negatively impacted through reduced academic and intellectual development, grade point averages, persistence, and institutional commitment (Nora & Cabrera, 1996). This effect is especially apparent in the most common learning environments. A study of undergraduate classrooms indicated that nearly half of students and a quarter of instructors experienced an incident of bias (Boysen, Vogel, Cope, & Hubbard, 2009). Minority students recognized an increased intensity of the campus racial climate, more prejudice from faculty and staff, and frequent occurrences of negative in-class experiences (Nora & Cabrera, 1996). Classroom discrimination complicates interaction with faculty and peers for ethnically diverse students.

Racism can affect Latino and African American students in different ways. For Latino students, awareness of racial tension is judged to be more troubling than actual experiences of racism. Racial tension leads to detachment from school and difficulty with personal-emotional attachment (Hurtado, Carter, & Spuler, 1996). In addition, Latinos are especially sensitive to the stereotype assumption that their admission occurred primarily because of their ethnicity. This perception further increases a student's need to validate their academic ability. Furthermore, Latino students must overcome the challenges and anxiety that originate from institutional efforts and programs designed to acculturate ethnic minorities to the dominant culture, such as orientation (Yang, Byers, Salazar, & Salas, 2009). Pappamihiel and Moreno (2011) have proposed culturally responsive teaching to minimize the negative effects of acculturation; this method of

instruction incorporates various aspects of the students' diverse culture into all aspects of teaching.

African Americans also experience racism and prejudices in a unique way. They frequently interact with professors who hold negative racial stereotypes and low academic expectations of African American students (Johnson-Ahorlu, 2012). These biases and stereotypes create a hostile environment that weakens academic motivation, prevents positive faculty-student relationships, disrupts learning opportunities, and negatively affects achievement. Conversely, African Americans who experience high levels of satisfaction with the campus racial climate are likely to participate in normative academic behaviors, which lead to higher levels of success (Museus, Nichols, & Lambert, 2008).

Public research institutions enroll disproportionately lower numbers of African American and Latino students than other types (Bailey & Dynarski, 2011). Providing a more welcoming environment can contribute to ensuring that more of these students are able to achieve degree attainment. Still, providing opportunities for validation and engagement in a safe environment do not resolve all the issues facing students from underrepresented populations. The next section discusses the impact of college costs and financial aid on degree progression.

## **FINANCIAL RESOURCES**

The availability of financial assistance is an important component of access to and completion of higher education, especially considering the steady rise in the price of attending college. Growth in the Higher Education Price Index, which is the cost of

providing higher education, has outpaced the Consumer Price Index consistently over the last decade (Commonfund Institute, 2011). At the same time, state appropriations per full-time equivalent student have rapidly decreased from \$9,156 in 1999 to \$7,418 in 2009 (Baum, 2011). Consequently, tuition at public four-year institutions has increased by six percent over the regular inflation rate. Sensitivity to increasing tuition is higher among low-income and lower-middle-income students than in upper-middle-income and upper-income students (Paulsen & St. John, 2002).

Financial aid is an important resource that can help students to overcome financial barriers to college attendance. Students with low-socioeconomic backgrounds have a 55% less chance of persisting than their high-socioeconomic peers (Chen & St. John, 2011). The odds of attaining a college degree within six years are significantly lower for those individuals with unmet financial need (Titus, 2006). Degree completion is greater among institutions that receive higher allocations of financial aid funding. One percent increases in the ratio of need-based aid-to-tuition resulted in a 2% increase in the odds of persistence; the ratio range nationally is .37% to 33.84% (Chen & St. John, 2011).

Moreover, merit aid is beneficial in that it prevents stop-outs (students who choose to exit college), while student loans marginally promote stop-outs (DesJardins, Ahlburg, & McCall, 2002). Reducing stop-outs has a positive impact on graduation rates. Every \$100 increase in student loans rises stop-out odds by 3%, while a \$100 increase in merit aid decreases stop-out odds by 10%. In addition, DesJardins, Ahlburg, and McCall (2002) provided research findings that supported work-study as another resource that helps to minimize stop-out risks.

The use of merit aid to prevent stop-outs can assist with degree attainment; however, policies that favor awarding merit-based aid instead of need-based aid can impact the economic and racial diversity of a student body. For instance, schools that choose to allocate discretionary funding to National Merit scholars (high academic achievers) rather than the financially needy Pell grant population will experience a reduction in socioeconomic diversity (Ehrenberg, Zhang, & Levin, 2006). Four-year doctoral institutions have increasingly reserved financial resources for academically meritorious students. Doyle (2010) discovered there was nationally only a \$260 difference in institutional grant aid based on SAT scores in 1992; that amount had increased to \$1,400 more by 2003 for students with high SAT scores compared with those with low SAT scores.

Institutions may have discretion in crafting their methodology to distribute private and institutional financial aid funds in a manner that promotes student degree completion; however, there are simply not sufficient funds to cover all college costs for every student. As a result, institutions must consider additional solutions to promote retention and graduation across the student body. One such approach includes institutional support programs designed to strategically influence progression to degree for a larger population of students.

#### **INSTITUTIONAL SUPPORT PROGRAMS**

The transitional first year of higher education is an opportunity for students to acquire a variety of skills and habits that can contribute to degree completion. A successful freshman year includes intellectual expansion, establishment and maintenance

of interpersonal relationships, consideration of a career path, emotional and physical wellness, formulation of an identity, and the development of life philosophy (Upcraft & Gardner, 1989). Unfortunately, non-traditional students such as African Americans and Latino/as often encounter difficulty achieving this comprehensive growth due to their need to focus on responding to the increased caliber of college-level academics instead of on developing relationships or out-of-classroom experiences (Terenzini et al., 1994).

The institution can assist students to rise to these challenges through various support programs. Nationally, over 80% of four-year college students participate in college orientation programs and 54% have enrolled in a first-year seminar (National Survey of Student Engagement, 2005). First-year seminars create opportunities for small sections of students to regularly interact with faculty or staff, and they emphasize activities that expand intellectual and practical competencies (Kuh, 2008). Students who take first-year seminars demonstrate increased interactions with faculty and participation in collaborative learning activities. These students also are more likely to perceive the campus to be supportive and are more academically challenged as a result of their course participation. The positive impact of the first-year seminar persists past the second year with increased retention through graduation (Schell & Doetkott, 2002).

Orientation is another academic support program that can positively affect college satisfaction, individual development, and perceptions of supportiveness of the campus. Orientation increases student involvement in educationally-enriching activities (Kuh, 2008). Likewise, a learning community is a support program that promotes academic success. These groups urge students to participate in active and collaborative learning



through out-of-classroom academic and social activities (Zhao & Kuh, 2004). Learning communities encourage stronger academic performance, an increase in satisfaction, and an enhancement of skills, competence, and knowledge. These communities are effective because they mandate meaningful student interactions with professors and peers, and they require daily commitment from students (Kuh, 2008). Nationally, 18% of first-year students at doctoral research universities participate in learning communities (National Survey of Student Engagement, 2005). These groups are available equally to ethnic minorities with participation differences being no more than two percent for African Americans, Latinos, and Anglo Americans.

Learning communities rely on group interactions to prompt student growth. In comparison, mentoring opportunities place importance on fostering individual, person-to-person relationships. Campbell and Campbell define mentoring as, “any situation in which a more-experienced member of an organization maintains a relationship with a less experienced, often new, member and provides information, support, and guidance for the purpose of enhancing the latter’s chances of organizational success” (2007, p. 136). Mentoring can happen in a variety of circumstances, such as in academic advising or through an established peer or faculty mentoring program. Students who positively assessed their academic advising typically experienced more interaction with faculty, perceived the college environment to be supportive, and were more satisfied with the college experience (National Survey of Student Engagement, 2005). Organized mentoring programs were effective at facilitating the connection of qualified students or faculty with new student mentees (Campbell & Campbell, 2007). This form of mentoring

has been demonstrated to increase retention rates, total hours completed, and grade point averages.

## **SUMMARY**

In summary, there are a number of variables that may influence progression to degree completion. Engagement that leads to academic and social support can be achieved through a number of academic support programs, such as first-year seminars, learning communities, and mentoring. It is imperative for students to be prepared to navigate a diverse campus, especially when the campus has some degree of racial/ethnic hostility. Finally, students must have sufficient financial resources to mitigate the increasingly high cost of attendance.

It is important to note that this literature review only accounted for the most widely publicized persistence factors, and it does not represent a complete review of all variables that can impact time-to-degree. There may be other unidentified or unexplored items that might play a significant role in degree completion. Still, the non-academic variables identified are sufficiently well-researched to support the exploration of this research study.

## **Theoretical Framework**

This study explored pre-matriculation characteristics that can predict graduation from a public research university within four years. The literature review above outlined a number of student and institutional factors that can inform such predictive measures, and these factors are supported by several important student retention theories. Astin's I-

E-O model, Spady's model of the undergraduate dropout process, Tinto's theory of student departure, Astin's theory of student involvement, and Pascarella's general model for assessing change assign importance to pre-matriculation factors and recognize the importance of multiple influences on academic success. The multi-dimensional characteristics of college success offer support for importance of considering pre-matriculation variables not only as a component of those dimensions (such as the input in the I-E-O model), but also as predictors of participation in post-matriculation programs, activities, and services, like faculty engagement and academic support programs. The following student development theories were considered in constructing the theoretical framework of this study.

#### **ASTIN'S I-E-O MODEL**

The primary theoretical framework adopted for this study is Astin's input–environment–output (I-E-O) model (See figure 2.1). Institutions commonly measure outcomes in terms of GPA, knowledge, skills, values, attitudes, aspirations, interests, and daily activities (Astin, 1970, 1991). This theory suggests that student outcomes are unavoidably influenced by an individual's pre-matriculation characteristics and their interactions with the college environment. Students enter higher education after having developed unique talents, skills, aspirations, and potential for growth and learning in a variety of pre-secondary settings. Prior research has consistently validated the influence of individual student traits on progression to and success in college (Bozick & DeLuca, 2005; Conley, 2008; Perna & Titus, 2005; Roderick, Coca, & Nagaoka, 2011; Stanton-Salazar, 1997; Venezia, Kirst, & Antonio, 2003). Accordingly, Astin argues that relative

student-to-student comparisons of outcomes are unsound unless they account for the variability in pre-college preparation.



Figure 2.1: Astin's I-E-O Model

Source: Astin (1975)

Moreover, the college environment can have a disparate impact on student success (Astin, 1970, 1991). Institutional policies, curriculum, the physical environment, and instructional methods can create fulfilling experiences that lead to success; conversely, some college ecosystems can dissuade progression to graduation. Again, research has authenticated the power of institutional stimuli such as the campus racial climate, engagement, financial aid policies, first-year support programs, mentoring efforts, orientation, and validation (Campbell & Campbell, 2007; Chen & St. John, 2011; Kim & Sax, 2009; Kuh, 2008; Nora & Cabrera, 1996; Pascarella & Terenzini, 2005; Pike & Kuh, 2005; Rendón, 1994). Taking these variables into consideration when evaluating outcomes can promote a more comprehensive understanding of how the university has contributed to success.

The study utilized Astin's I-E-O model as the chief framework for the research design. It has been utilized in studies that measure development and engagement (Astin & Sax, 1998; Cole, 2007), and has been used to examine student retention, persistence,

and degree completion (Fisher & Heaney, 2011; House, 1999; Kelly, 1996). A plethora of research related to I-E-O is performed through CIRP, which is the owner of decades of data from the Freshmen Survey (Renn & Reason, 2013). The fact that this study was based upon CIRP data supported the adoption of the I-E-O model as the guiding framework. Nevertheless, persistence studies rely on multiple theoretical frameworks, and the overlapping characteristics of these theories provide additional validation of the I-E-O model. The additional theories considered are summarized below.

#### **SPADY'S MODEL OF THE UNDERGRADUATE DROPOUT PROCESS**

Spady's model of the undergraduate dropout process likens dropout to Durkheim's theory of suicide, which holds that divergent societal values and lack social interaction can lead to suicide (Spady, 1971). He proposes that students arrive on campus with a variety of characteristics, beliefs, and interests that have been shaped by their high school and family environment. These predispositions will have an impact on how well the student adjusts to the new college environment, which is inherently plagued with various social and academic obstacles. The student is challenged to utilize their pre-existing academic and family-driven background characteristics to successfully navigate academic and social development on campus. Individuals that fail to attain expected academic or social connections will likely drop out of college. In comparison, students that have attitudes, interests, and personalities compatible with the environment, termed normative congruence by Spady, will become committed to the college process, thereby increasing their likelihood of degree completion. An illustration of the model is provided below:

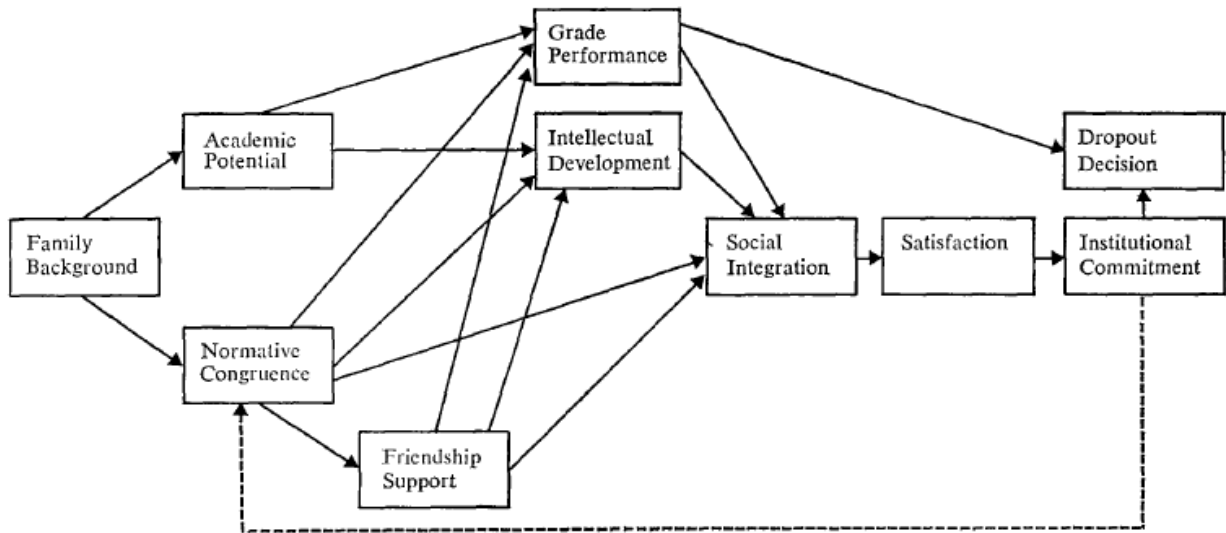


Figure 2.2: Spady's model of the undergraduate dropout process

Source: Spady (1971)

#### TINTO'S STUDENT INTEGRATION MODEL

Tinto's theory of student integration model also stems from Durkheim's theory of suicide (Tinto, 1975). He likewise recognizes the importance of pre-matriculation characteristics, such as academic ability, attitude, personality, family backgrounds, and individual goals. Tinto argued that student expectations and motivations substantially impacted academic success. He argued that academic integration occurs longitudinally through individual and institutional commitments that promote academic validation and productive social interactions. Students achieve recognition of their achievement through tangible grade metrics and more abstractly through intellectual development. Social integration transpires through formal and informal interactions with peers groups, administrative staff, and faculty. Negative social integration or lack of institutional

commitment can lead to early college exit through student-initiated withdrawal. The model is illustrated below:

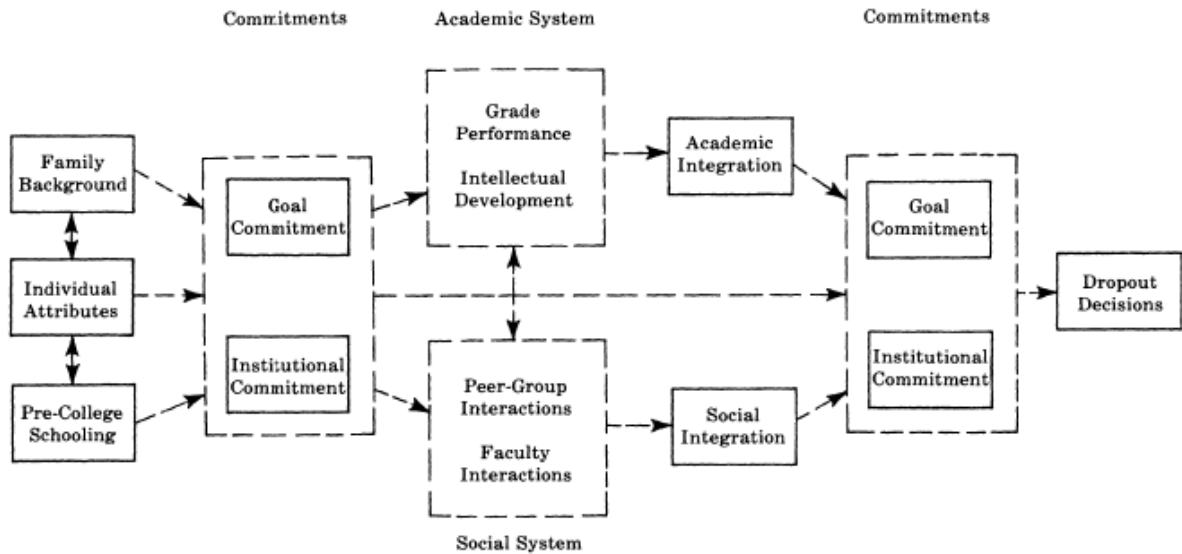


Figure 2.3: Tinto's student integration model

Source: Tinto (1975)

### ASTIN'S THEORY OF STUDENT INVOLVEMENT

Astin's theory of student involvement emphasizes the physical and psychological energy a student personally contributes to the educational process (Astin, 1999). Specifically, Astin (p. 518, 1999) proposes that a student is involved when he or she, "devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students." The investment of energy occurs along a continuum, can be measured quantitatively and qualitatively, and impacts the degree of student learning. Astin

suggested that educational programs could be created or modified to maximize opportunities for students to become involved in their educational experience.

#### **PASCARELLA'S GENERAL MODEL FOR ASSESSING CHANGE**

Pascarella's general model for assessing change provides a theoretical formula with substantial similarity to the I-E-O model. Pascarella proposed five distinct sets of variables that influence college student development (Pascarella & Terenzini, 2005). First, as in Tinto's theory of student departure, students matriculate with an established set of characteristics, such as aptitude, achievement, personality, aspiration, and ethnicity. Second, the institution holds its unique attributes, including enrollment, faculty-to-student ratio, selectivity, and percentage of in-state students. These two factors converge to form the third variable, the college environment.

Next, the combination of these three factors influence the frequency and content of interactions with faculty and peers. The last of the five variables is defined by the quality of the student's efforts. These items can interact in distinct ways depending on the characteristics of the institution and students. The manner in which they intermingle ultimately impacts student learning and cognitive development. Pascarella's model offers more specific descriptions, compared to Tinto's model of the variables that influence students. However, this theory is designed to specifically assess change whereas Tinto's model evaluates a greater variety of outcomes.



## **Conclusion**

The preceding literature review outlined a variety of factors that can impact college outcomes. These items affect students at various points along their academic endeavor, from pre-matriculation to their final year in college. Several theoretical frameworks recognize the role these environmental and personal factors play in persistence to degree attainment. However, Astin's I-E-O model was concluded to be most appropriate for this study because it recognized the interaction of the input and environment variables and thus attempts to understand how that relationship ultimately influences the student outcomes of interest. The data elements of this study could be logically categorized and evaluated utilizing all three components of his model. Also, I-E-O was best suited for this study as a result of its strong connection to the Freshmen Survey and to past research that has used the Freshmen Survey to analyze degree attainment.

## CHAPTER THREE: METHODOLOGY

### Problem Statement

The challenge for the university is to maintain racial/ethnic diversity and increase four-year graduation rates. The purpose of this study was to isolate non-academic characteristics that can be used to identify students that are capable of degree attainment in four years despite their historically low performance on standardized academic measures. In addition, it was important to understand how impending modifications to financial aid packaging policies could influence the effectiveness of non-academic predictors.

### Research Questions and Hypotheses

This study sought to identify predictive non-academic measures related to degree completion in four years, and it attempted to accomplish this by utilizing the following research questions and hypotheses.

#### RESEARCH QUESTION 1:

What is the predictive relationship between existing Freshmen Survey constructs and four-year graduation probability among African Americans and Latinos at The University of Texas at Austin?

*Null Hypothesis I* (Diversity Predisposition): Predisposition to navigate diversity on campus will not have an impact on four-year graduation rates.

*Alternative Hypothesis I* (Diversity Predisposition): Predisposition to navigate diversity on campus will have a positive impact on four-year graduation rates.

*Null Hypothesis II* (Academic Behaviors): Predisposition to engage in constructive academic behaviors will not have an impact on four-year graduation rates.

*Alternative Hypothesis II* (Academic Behaviors): Predisposition to engage in constructive academic behaviors will have a positive impact on four-year graduation rates.

*Null Hypothesis III* (Engagement Expectations): Expectations to participate in post-matriculation academic engagement behaviors will not have an impact on four-year graduation rates.

*Alternative Hypothesis III* (Engagement Expectations): Expectations to participate in post-matriculation academic engagement behaviors will have a positive impact on four-year graduation rates.

*Null Hypothesis IV* (Favorable Self-Concept): Favorable self-concept will not have an impact on four-year graduation rates.

*Alternative Hypothesis IV* (Favorable Self-Concept): Favorable self-concept will have a positive impact on four-year graduation rates.

**RESEARCH QUESTION 2:**

How does the type and amount of financial aid impact the predictive accuracy of select items from the Freshmen Survey on four-year graduation rates for African American and Latino students?

*Null Hypothesis V* (Grant Aid Effect): More grant aid will have an equal or lesser impact on four-year graduation rates than loan aid.

*Alternative Hypothesis V* (Grant Aid Effect): More grant aid will have a greater positive impact on four-year graduation rates than loan aid.

## **Analytical Framework**

The purpose of the study was to identify the extent to which activities associated with diverse interactions, academic skills, engagement, and self-efficacy can serve as accurate predictors of four-year graduation. It is important to analyze these factors while also recognizing that they do not operate in isolation from relevant student biographical characteristics and environmental components. Astin's I-E-O model provided the most logical framework with which to assess the multiple, progressive variables investigated in this study. Adoption of this model is supported by its utilization in studies that measure development, engagement, persistence, retention, and graduation (Astin & Sax, 1998; Cole, 2007 Fisher & Heaney, 2011; House, 1999; Kelly, 1996). Also, Astin's I-E-O model is the chief theoretical framework used by the agency that manages the Freshmen Survey (Renn & Reason, 2013) thereby increasing its applicability to this study design.

## **Research Design**

### **SOURCES OF DATA**

There were two primary sources of data that were incorporated into the analysis of four-year graduation predictors. First, this study utilized a pre-existing dataset that included responses from the 2008 CIRP Freshmen survey. This survey was administered by the Dean of Students office during the summer orientation prior to the fall enrollment period (Nava, 2010). The primary data file of CIRP Freshman Survey respondents was

received from the Division of Diversity and Community Engagement (DDCE) at The University of Texas at Austin (UT). The data required from the survey was limited to pre-selected variables, although the dataset incorporated answers from the complete survey. Response items were comprehensive, containing items that provided insight to behaviors, academic preparation, expectations, engagement, values, goals, and demographic characteristics (HERI, 2013). The dataset included institutional-based student identifiers that were used to merge the data from the Freshmen Survey with institutional academic and financial information.

The second source of data was the Office of Student Financial Services (OSFS). The CIRP dataset mentioned above was forwarded to the OSFS. The OSFS updated the file to include specific academic and financial data necessary to test the proposed hypotheses. The OSFS receives detailed family income information from the United States Department of Education for students that have completed a Free Application for Federal Student Aid, the primary national application for all federal student financial assistance (Student Financial Services, 2011). In addition, the OSFS has full access to admission application data and academic transcripts in order to assess eligibility for financial aid and scholarships. From these sources, the OSFS can determine four-year graduation success, high school GPA, financial aid awards, gender and race data, and family income level.

The director of the Office of Student Financial Services had approved access to the secondary data set containing demographic and financial variables that would be merged with the primary file. However, the dissertation committee strongly

recommended that additional official approval be obtained from the next level of UT Austin administration. The DDCE provided the final approval for access to the dataset received from the OSFS. The finalized dataset excluded student identifier information.

Each hypothesis tested was developed considering information from both the CIRP Freshmen survey and the financial aid and academic data obtained from the OSFS via the DDCE.

### **POPULATION**

The target population evaluated by this study was first-time, full-time, first-year freshmen that enrolled at the university in fall 2008. The total population for the CIRP survey was 7,420 students, of which 6,718 persisted to enrollment for fall 2008. Of the population that matriculated, 3,701 students (55%) completed a Freshmen Survey (Nava, 2010), and thus represented the sample for this study. The dependent variable is four-year graduation, and as a result, all students will ultimately be identified as either receiving a degree in four years or not receiving a degree in four years. The starting population remained at 3,701 survey respondents, although data analysis required a reduction to the population size to 2,603 (39% of matriculated population) in order to account for missing or incomplete data. Descriptive statistics are provided of the final sample were included in chapter 4.

## **VARIABLES**

### **Dependent Variable**

The dependent variable in this study was a dichotomous value that was calculated based on a student's degree completion by summer 2012. The research reviewed did not provide an exact indication of the precise ending semester used to define four-year graduation. However, the Office of Student Financial Services at UT Austin has defined four-year graduation for its operational purposes (T. Melecki, personal communication, March 13, 2014). Based on this definition, students that enrolled in fall 2008 and received a degree by summer 2012 received a completer designation for this study, while all other students were classified as non-completing.

### **Independent Variables**

The CIRP Freshmen Survey contained almost three hundred variables for analysis (HERI, 2010). This research study employed the use of the principle of parsimony, which suggests that explanations for phenomena should be as succinct as possible (Domingos, 1999). Accordingly, independent variables were selected based on their relevance to the literature reviewed. Blocked variables were included to control for confounding variables that may be influencing the overall predictive effect of the model. All blocks are listed in table 3.1. The first block of variables represented background characteristics related to race, gender, and family income. College completion has varied substantially based on race, gender, and family income (Bailey & Dynarski, 2011; Bowen, Chingos, & McPherson, 2009; Ryan & Siebens, 2012; United States Census Bureau, 2012);

moreover, success on standardized performance metrics appears to vary by gender (Chapman, Laird, Lfill, & KewalRamani, 2011; Nord et al., 2011).

The variables included in the second block are the academic items that have been shown to be strong predictors of degree completion, SAT scores and high school GPA (Astin & Oseguera, 2005; Zwick & Himelfarb, 2011). Higher education institutions typically use a combination of SAT Scores, high school GPA, race, and gender to predict four-year graduation rates (DeAngelo et al., 2011). Furthermore, these variables were utilized in a national study that examined the strength of CIRP data to predict graduation, which strengthens the rationale for their inclusion as independent variables.

The third block contained financial aid variables pertaining to Pell grant eligibility, grants/scholarships, and loans. Prior research has established that lack of need-based assistance can hinder academic progression (Chen & St. John, 2011; DesJardins, Ahlburg, & McCall, 2002; Ehrenberg, Zhang, & Levin, 2006; Titus, 2006). The presence of financial aid can be expected to have a positive impact on persistence; consequently, this independent variable will be included in the model to understand and control for its impact on the predictability of non-academic pre-college independent variables.

The remaining independent variables were directly related to factors that might serve to predict four-year graduation. These variables represented pre-existing constructs that have been designed by the Higher Education Research Institute to group and measure similar student traits and behaviors (HERI (2), 2013). These constructs have been well-tested and were provided so that researchers and institutions can accurately interpret data and maximize survey results (Sharkness, DeAngelo, & Pryor, 2010). These



recommended constructs were developed through an exhaustive literature review of previously utilized construct measures of latent traits and the statistical methods used to evaluate those traits. Constructs are listed in Table 3.2 and additional detailed information is provided in Appendix B.

The first construct used as an independent variable was pluralistic orientation. The rationale for this item is that poor racial climates can lead to dissatisfaction (Museus, Nichols, & Lambert, 2008) and deficient academic performance (Nora & Cabrera, 1996). Incidents of racism are most common among minority students (Boysen, Vogel, Cope, & Hubbard, 2009; Museus, Nichols, & Lambert, 2008; Nora & Cabrera, 1996). Based on these findings, it is possible to deduce that being prepared for a more racially-charged campus may lead to academic success.

The second construct was habits of mind. The foundation for this item was that academic behaviors, such as problem solving, self-monitoring, and self-control can increase academic success (Conley, 2008) while participation in challenging academic environments can lead students to develop strong academic skills (Conley, 2008; Roderick, Nagaoka, & Coca, 2009). The third construct is likelihood of college involvement. Numerous studies have recognized the importance of engagement (Hausmann, Ye, Schofield, & Woods, 2009; Kim & Sax, 2009; Meeuwisse, Severiens, & Born, 2010; Ostrove & Long, 2007; Pascarella & Terenzini, 2005; Pike & Kuh, 2005) and how it can lead to academic success (Kuh, Cruce, Shoup, & Kinzie, 2008). Early self-reports of intent to engage when on campus may foretell such behaviors, and in turn, predict four-year graduation.

The last constructs were academic self-concept and social self-concept. Underrepresented students have often been assessed as academically inferior by peers and faculty (Rendón, 1994); however, validation of ability through interactions with other students and professors can lead to academic success (Turner, Chandler, & Heffer, 2009). Students that hold strong self-assessments of their abilities prior to college may have minimal need for validation in college, thereby leading to greater four-year graduation.

Table 3.1: Independent Variable Blocks

Items	Scale and Range
<b><u>Block I: Background Characteristics</u></b>	
Race (Latino)	1=no, 2=yes
Race (African American)	1=no, 2=yes
Race (Other)	1=no, 2=yes
Gender	1=female, 2=male
Parental First Year Adjusted Gross Income	1=Less than \$20K, 8=More than \$200K
<b><u>Block II: Academic Input</u></b>	
High School GPA	Continuous
SAT Composite Score	
<b><u>Block III: Student Financial Aid</u></b>	
Loan Total – Year 1	Continuous
Grant/Scholarship Total – Year 1	
Pell Grant Eligibility	1=no, 2 = yes

Table 3.2: Independent Variable Constructs

Items	Scale and Range
<b><u>Construct I: Pluralistic Orientation</u></b>	
Ability to see the world from someone else's perspective	1=Lowest 10%, 5=Highest 10%
Tolerance of others with different beliefs	
Openness to having my own views challenged	
Ability to discuss and negotiate controversial issues	
Ability to work cooperatively with diverse people	
<b><u>Construct II: Habits of Mind</u></b>	
Ask questions in class	1=not at all, 3=frequently
SAT Composite Score	
Support your opinions with a logical argument	
Seek solutions to problems and explain them to others questions	
Revise your papers to improve your writing	
Evaluate the quality or reliability of information you received	
Take a risk because you feel you have more to gain	
Seek alternative solutions to a problem	
Look up scientific research articles and resources	
Explore topics on your own, even though it was not required for a class	
Accept mistakes as part of the learning process	
Seek feedback of your academic work	
<b><u>Construct III: Likelihood of College Involvement</u></b>	
Socialize with someone of another racial/ethnic group	1=no chance, 4=very good chance
Participate in a study abroad program	
Participate in a volunteer or community service work	
Participate in student government	
Participate in student clubs/groups	
<b><u>Construct IV: Academic Self-Concept</u></b>	
Self-Rating: Academic ability	1=Lowest 10%, 5=Highest 10%
Self-Rating: Drive to achieve	
Self-Rating: Mathematical ability	
Self-Rating: Self Confidence (Intellectual)	
<b><u>Construct V: Social Self-Concept</u></b>	
Self-Rating: Leadership ability	1=Lowest 10%, 5=Highest 10%
Self-Rating: Popularity	
Self-Rating: Public speaking ability	
Self-Rating: Self Confidence (social)	

## **INSTRUMENT**

### **The Freshmen Survey**

The CIRP Freshmen Survey is a tool utilized to measure a multitude of college and university freshmen characteristics (Cooperative Institutional Research Program, 2012). The instrument has been administered to nearly 1,800 higher education institutions across the United States since 1965 (HERI, 2012). It was originally established by Alexander W. Astin at the American Council of Education (Keup, 2004). The data collected by the survey reveals pre-matriculation demographic statistics related to income, parental education, and student ethnicity (Cooperative Institutional Research Program, 2012). In addition, it is designed to identify past behaviors in high school, academic preparation, decisions related to college choice, and concerns pertaining to the cost of attendance. Moreover, the instrument gathers data related to student attitudes, beliefs, values, goals, and post-college plans.

This survey was intended to be the pre-test for a series of three follow-up surveys that, together, provide a longitudinal assessment of student development and outcomes (HERI (2), 2012). The Freshmen Survey is primarily intended to assess the views and characteristics of first-time, full-time enrolled students. The precision of data obtained through the Freshmen Survey can be weakened by a variety of special circumstances that create opportunities for error. First, the standard error is increased due to the absence of true random sampling participant selection, fluctuations in participation, instrument textual and order modifications, and historical institutional stratification changes (HERI (3), 2012). Nonetheless, study results have been frequently relied upon to support

academic research initiatives, and this study avoided the aforementioned limitations because the population consisted of data from only one year.

## **DATA ANALYSIS**

This study utilized binary logistic regression to analyze the extent to which the independent variables affected and predicted the dependent variable outcome. This particular statistical method examines the influence and probability that continuous or categorical variables have on a dichotomous outcome (Anderson, 2001). Logistical regression is an appropriate means to predict relationships because, “Logistic regression forms a best fitting equation or function using the maximum likelihood method, which maximizes the probability of classifying the observed data into the appropriate category given the regression coefficients” (Burns & Burns, 2009). All analyses were performed using IBM SPSS Statistics 21 predictive analytics software. An alpha level of .05 was used to assess statistical significance.

The first step in the examination was to review the dataset received from the Office of Student Financial Services. Frequencies and descriptive statistics were evaluated to locate abnormalities in data, to determine necessary weighting, and to attain final population counts based on the merged and missing data. A number of students will have to be removed from the dataset because they had missing independent variable data. For example, income information is an optionally reported item on the school’s admission application and was not available for each student. Furthermore, some of the students did not file a Free Application for Federal Student Aid and therefore were missing data related to financial aid received. This was anticipated because about 30% of

the students at The University receive no form of financial assistance (Student Financial Services, 2011). Dummy variables were created for the race response item so that race effects can be entered into the model.

This study was intended to analyze how four-year graduation rates can be predicted with survey data, specifically for African Americans and Latinos. Accordingly, weighting was utilized to provide a precisely representative sample. Also, a reliability analysis was performed on each set of questions contained in the constructs, and factor analysis was used to replicate the CIRP construct scores.

Next, a correlational analysis was performed to understand the relationship between each entered independent variable and the dependent variable. Variables with low Pearson correlations were considered for removal from the model prior to performing the regression analysis, although the final model actually included all variables assessed. The independent variables were categorized into blocks in a manner that reflects Astin's I-E-O model. Potentially confounding variables related to race, gender, and income were placed in one block, academic performance in the second block, and financial aid in the next block. The construct scores will be positioned into a final block. Illustration 3.1 below provides a summary of the blocks in relation to the I-E-O model:



2. Logistical regression does not utilize the  $R^2$  coefficient due to the dichotomous outcome, and as a result, SPSS software will rely on the Naglkerke's  $R^2$  to assess strength of the predictors (Burns & Burns, 2009).
3. The classification table provided an assessment of how effective the model was at predicting outcomes; this method of evaluation is recommended over a typical goodness-of-fit statistic.
4. The effect of each independent variable was analyzed considering the Wald statistic. Independent variables with significance of less than .05 were removed.
5. The exponentiation of the B coefficient (Exp (B)) is the odds ratio that served as the determinant of the level of effect of the independent variable on the dependent variable.

### **Limitations**

There are a number of limitations to this study that were considered in the analysis phase. The most important limitation is that the research design only included one environmental variable, financial aid. This limitation resulted from the institution's lack of adequate documentation of the variety of post-enrollment experiences and activities highlighted by the literature review that can influence degree completion. Independent variables may be shown to have significant effects on degree attainment in four years, but this effect may be the product of an environmental component not controlled for in the study.



However, prior research has validated the utility of pre-college non-academic factors to predict four-year graduation, even when those items are assessed without considering the college environment (DeAngelo et al., 2011). Also, the survey respondents all participated in freshmen orientation which can be considered an environmental institutional support program. In addition, the wide variety of academic support programs and engagement opportunities at the university may have increased the likelihood that survey respondents had similar exposure to these sorts of factors. Furthermore, the independent variables were grounded in research related to environmental factors to promote academic success. As such, behaviors reviewed by this study might be consistent with those of individuals that seek academic support programs; consequently, including additional environmental factors could be unnecessary and redundant.

The second limitation of this study is that it only assessed students that demonstrated a commitment to attend orientation. In turn, there may be an overrepresentation of students that are more likely to seek engagement and support services. Similarly, this study was limited in that the response rate of the Freshmen Survey is about 50%, and this may skew the results in favor of students that were prone to exhibit good academic behaviors, such as attending orientation. Moreover, the data file did not have financial aid variables for all survey respondents. Some students that did not provide such data could have not needed financial assistance, but other student might have not known how to apply. Additionally, merging data from multiple sources could

have prompted mismatched or incomplete data. The data was analyzed and cleaned appropriately to minimize these issues.

Another limitation was that, in exercising parsimony and relying on existing research, the study may have overlooked other alternative independent variables that could better predict four-year graduation. Likewise, the study is limited to the items included on the CIRP Freshmen Survey, and expanding the study to include other instruments might broaden the hypotheses. The last limitation is that the population was restricted to one year of data at one institution. The circumstances that lead to four-year graduation may have evolved since 2008 to no longer be relevant in 2013. The findings might also lack applicability to institutions other than four-year public research universities.

## **CHAPTER FOUR: RESULTS**

This research project was intended to identify predictive non-academic measures related to degree completion in four years by utilizing binomial logistic regression analysis for African American and Latina/o students at The University of Texas at Austin. Previous research has illuminated a variety of factors that can impact college outcomes. Academic and social preparation, college readiness, and confidence to participate in the dynamic college learning environment can affect the pace of degree attainment. Students with the skills to maximize faculty and peer engagement while overcoming the challenges of a diverse atmosphere may increase their odds of receiving a college diploma in a four-year time frame. Astin's I-E-O model was chosen as the guiding theoretical framework for this study due to its recognition of the interaction of the input and environment variables that ultimately influence outcomes. The data elements of this study were logically categorized and evaluated utilizing all three components of his model.

This study attempted to answer two primary research questions through the use of data from the CIRP Freshmen Survey and institutional demographic and academic outcome variables. First, the study sought to identify the predictive relationship between existing Freshmen Survey constructs and four-year graduation probability among African Americans and Latinos. The specific constructs investigated are related to predisposition to navigate diversity on campus, predisposition to engage in constructive academic behaviors, expectations to participate in post-matriculation academic engagement behaviors, and having a favorable self-concept. Second, this study attempted to

understand how the type and amount of financial aid a student receives interacts with other input variables to predict four-year graduation. Student-level first-year financial aid packages were evaluated to explore this relationship.

This chapter is divided into six parts. Part one described how the data was prepared, including recoding and factor creation. Part two outlined the descriptive statistics of the dependent variable and the independent variable, and that data was compared to the UT Austin population of first-time-in-college freshmen of fall 2008. Parts three and four discussed the factor analysis and correlational analysis. Part five provided the details of the regression analysis results, including the evaluation of overall model fit, and the individual predictor results. The final part evaluated the results of regression analysis to assess the hypotheses and determine which hypotheses could be rejected or accepted.

### **Data Preparation**

The CIRP Freshman Survey dataset contained a total of 3,701 records, although there were a number of responses that were incomplete, thereby requiring two steps to reduce the file to valid, usable records. First, students with invalid or missing student identifiers were removed from the dataset; this was necessary to successfully merge student demographic and income information from the Office of Student Financial Services (OSFS). This process reduced the population to 2,983 records. Next, students were excluded if they had not responded to the questions associated with the constructs to

be measured. The final sample size was 2,603 students; more detailed descriptive statistics of the data set were provided in the next section.

The CIRP Freshmen Survey was merged with the data provided by the OSFS. Specifically, the following fields related to the independent variables were added: race, gender, parental adjusted gross income, Federal Pell Grant eligibility, Loan total, Grant and Scholarship total, and SAT equivalent score. The SAT equivalent was calculated by the institution to provide a common method of comparison for those students that choose to provide ACT scores instead of SAT scores. Lastly, the dependent variable, four-year graduation, was included in the merge. Four-year graduation was coded as true for those students that had completed their degree by spring 2012 or summer 2012.

#### **RECODING**

Several variables required recoding to prepare the data for the binomial logistical regression analysis. First, the race field contained a nominal scale of seven different classifications: African American, American Indian, Asian, Anglo, Hispanic, Foreign, and other. Three dummy variables were created with dichotomous values, Latino (1=Not Latino, 2=Latino), African American (1= Not African American, 2=African American), and Other Race (1=Latino or African American, 2= American Indian, Asian, Anglo, Foreign, or other). The Other Race category was essentially redundant when included with the other two categories, and as such, the regression analysis performed automatically excluded that variable.

The loans and grants and scholarship fields were recoded to account for students that had not applied for financial aid. The original dataset provided by the OSFS

contained either a dollar amount for students that had a financial aid record or a system missing value for those that had not applied for financial aid. Students with missing values were recoded to an amount of \$0, because they did not actually receive any financial aid funding.

### **WEIGHTING**

This study was intended to analyze how four-year graduation rates could be predicted with survey data, specifically for African Americans and Latinos. Accordingly, the sample size of those two ethnic categories should have reflected the actual population. The final data set sample included 21.1% Latinos, 4.3% African Americans, and 74.4% other races. These results demonstrated an overrepresentation of Latinos (actual population 19.9%) and an underrepresentation of African Americans (actual population 5.6%). The disparity was minimal; still, weighting was utilized to provide a precise representative sample. The weighting was performed using population proportion matching. The percentage of the population stratum of each of three ethnic categories was divided by the percentage of the sample stratum for each category. This results of this computation were that Latinos received a weighting of .94, African Americans received 1.3, and all other races received .997. All data reported below has been calculated considering this weighting.

### **Descriptive Statistics of Population**

Descriptive statistics were calculated for the dependent and independent variables. The overall sample data was listed in Table 4.1. The analysis demonstrated that the four-

year graduation rate of the sample (the DV) 53.6% was only slightly higher than the actual population rate of 52.03% for the 2008 cohort. The research questions investigated by this study were developed with a specific intent to consider race in the analysis, and given the importance of these variables, appropriate weighting was applied prior to calculating the final descriptive statistics and regression analysis. The mean SAT of the sample was highly consistent with the population mean of 1232. The Pell grant eligible population was somewhat overrepresented at 25.6% compared to 23%. The other financial-related variable, parental AGI range, was comparable to the population, as is illustrated in Table 4.2. Females were the most overrepresented group in the sample with 62% compared to 55.1% enrolled at UT Austin in fall 2008.

Table 4.1: Primary Descriptive Statistics

Variable	N	Mean	SE	S
Four Year Graduation (DV) (1=no, 2=yes)	2,598	1.54	.010	.499
Graduated in four years	1,391 (53.6%)			
Did not graduate in four years	1,207 (46.4%)			
Race Latino (1=no, 2=yes)	2,598	1.20	.008	.399
Latino	515 (19.8%)			
Not Latino	2,083 (80.2%)			
Race African American (1=no, 2=yes)	2,598	1.06	.005	.231
African American	147 (5.7%)			
Not African American	2,451 (94.3%)			
Race Other (1=no, 2=yes)	2,598	1.75	.009	.436
Other race	1,936 (74.5%)			
Not other race	662 (25.5%)			
Gender (1=Female, 2=Male)	2,598	1.38	.010	.486
Male	988 (38%)			
Female	1,610 (62%)			
Parental AGI	2,598	3.94	.027	1.354
Less than \$20,000	180 (6.9%)			
\$20K to \$39,999	353 (13.6%)			

Table 4.1 continued

\$40K to \$59,999	325 (12.5%)			
\$60K to \$79,999	324 (12.5%)			
\$80K and above	2,598 (54.5%)			
Pell Eligible (1=no, 2=yes)	2,598	1.26	.00856	.436
Pell Eligible	644 (25.6%)			
Not Pell Eligible	1,934 (74.4%)			
What Was Your Average Grade In High School?	2,584	7.46	.015	.755
C+	1 (.0%)			
B-	10 (.4%)			
B	56 (2.1%)			
B+	177 (6.8%)			
A-	833 (32%)			
A or A+	1,508 (58%)			
SAT Equivalent Score (Range 650 – 1600)	2,598	1233	3.19	163
Loan Total	2,598	\$3,844	123.66	\$6,303
Grants and Scholarships Total	2,598	\$5,087	123.38	\$6,289
Academic Self Concept Factor	2,598	.00	.0196	1.00
Social Self Concept Factor	2,598	.00	.0196	1.00
Pluralistic Orientation Factor	2,598	.00	.0196	1.00
Habits Factor	2,598	.00	.0196	1.00
Likelihood of College Involvement Factor	2,598	.00	.0196	1.00

*Note: The factor creation process utilized a regression method technique to create a standardized scale mean centered at zero with a standard deviation of one. The resulting factors provide for easier interpretation.*

Table 4.2: Parental Adjusted Gross Income of Sample vs. Population

Parental AGI	Sample %	Population %
Less than \$20,000	6.9%	7.25%
\$20K to \$39,999	13.6%	12.03%
\$40K to \$59,999	12.5%	10.79%
\$60K to \$79,999	12.5%	9.55%
\$80K and above	54.5%	60.38%



Overall, the descriptive statistics indicated that the total population was well represented in the sample population. This was partially expected considering the large number of survey respondents. The income and academic statistics offer some evidence that The University of Texas enrolled an academically stellar class in 2008 that was composed of a range of family incomes. This may be a reflection of the state's Top 10 percent automatic admission program that essentially provides access to well-performing students, regardless of their income. Still, The University had a substantial (over 60%) portion of its enrollment represented by families with annual incomes over \$80,000. The mix of higher performing and financially secure families should be considered when results of this study are analyzed.

### **Factor Creation**

The CIRP Freshman survey dataset only contained the individual survey responses of each of the questions that comprised the five constructs proposed as independent variables. The calculation of factors was necessary to produce a single independent variable to represent each of the CIRP constructs examined by the study. Studying each question individually would have negated the validity testing and research that had been performed by the Higher Education Research Institute to identify appropriate groupings of questions for measuring a single latent trait (Sharkness, DeAngelo, & Pryor, 2010). A reliability analysis was performed on each set of questions contained in the constructs, and each series of questions demonstrated strong Cronbach's Alphas as was illustrated in Table 4.3.

Table 4.3: Cronbach's Alphas for Factors

Factor	Items	$\alpha$
Academic Self Concept	4	.654
Social Self Concept	4	.787
Pluralistic Orientation	5	.793
Habits of Mind	11	.771
Likelihood of College Involvement	5	.624

Five Principal Component Factor analyses were performed to reduce the multiple question responses into a single score, such as is the case with CIRP constructs (Cooperative Institutional Research Program, 2010). Descriptive statistics and correlational tables of each factor analysis were included in Appendix C. The five factors created were: Academic Self Concept, Social Self Concept, Pluralistic Orientation, Habits of Mind, and Likelihood of College Involvement. The Kaiser-Meyer-Olkin (KMO) results listed below in Table 4.4 indicated that each group had a factorable sample. In addition, Table 4.4 illustrated the results of Bartlett's Test of Sphericity, which concluded that factor analysis was suitable for each group ( $p < .05$ ).

Table 4.4 Bartlett's Test of Sphericity for Factors

Factor	KMO	Bartlett
Academic Self Concept	.682	p = .000
Social Self Concept	.759	p = .000
Pluralistic Orientation	.795	p = .000
Habits of Mind	.829	p = .000
Likelihood of College Involvement	.715	p = .000

Each series of questions was reduced down to one factor in order to replicate the single measure utilized by the CIRP constructs, although only one factor, Habits of Mind, required reduction to one factor. The factor component matrix is included in Appendix C, Table C16. Each question was preserved in the factor scoring even though some individual questions did not make a strong overall contribution to the factor. Again, this approach was undertaken to reproduce the question groupings of the CIRP constructs that were confirmed to accurately measure a single latent trait (Cooperative Institutional Research Program, 2010). Table 4.5 below lists the Eigenvalues for each factor:

Table 4.5: Eigenvalues for Factors

Factor	Eigenvalue
Academic Self Concept	2.019
Social Self Concept	2.454
Pluralistic Orientation	2.760
Habits of Mind	3.403
Likelihood of College Involvement	2.06

## **Correlation Analysis**

A bivariate correlational analysis was conducted to examine the relationship between the dependent and independent variables. The complete results of the correlation analysis were listed in Appendix D. The information contained in Table 4.6 below was evaluated to determine the correlation between four-year graduation, the survey questions, and student demographic data. A total of 13 of the 16 variables significantly ( $p < .01$  for all but Social Self Concept at  $p < .05$ ) correlated with four year graduation. However, the three insignificant variables (loans, pluralistic orientation, and habits of mind) were still included in the regression model. Considering Astin's I-E-O model, the five constructs (or factors) are essential to establish a measure of inputs, and the variable related to loan amount received was enlisted as an environmental measure. Removing these variables would have diminished the comprehensiveness of the input and environment components of the model. Also, these variables were necessary to explore the primary research questions and hypotheses examined by this study.

Table 4.6: Correlation Table for Independent Variables and Dependent Variable

Variable	Pearson Correlation
Race Latino	-.086**
Race African American	-.067**
Race Other	.115**
Gender	-.122**
Parental AGI	.154**
Pell Eligible	-.130**
What Was Your Average Grade In High School?	.092**
SAT Equivalent Score	.170**
Loan Total	-.034
Grants and Scholarships Total	-.097**
Academic Self Concept Factor	.065**
Social Self Concept Factor	.039*
Pluralistic Orientation Factor	-.007
Habits of Mind Factor	.019
Likelihood of College Involvement Factor	.088**

### Regression Results

A binomial logistic regression analysis that used a blocked step-wise enter method was performed to predict the probability of graduating in four years using a series of input and environmental factors, including five constructs from the Freshman Survey and post-matriculation financial aid indicators. All block results were included in Appendix E.

#### OVERALL MODEL FIT

A test of the full model against a constant only model was statistically significant, demonstrating that the independent variables as a group reliably distinguished between those that graduated in four years and those that did not graduate in four years (chi square = 181.996,  $p < .000$  with  $df=14$ ). The Hosmer and Lemeshow Test result showed that the model was well fitting with  $p=.875$  and  $df=8$ . The Nagelkerke's  $R^2$  of .091 indicated a

mild relationship between grouping and prediction. Predictive power of the model was measured by analyzing the improvement of power between steps (Burns & Burns, 2009). The overall prediction success of the model was 60.9% with 47.4% accuracy in forecasting a student to not graduate in four years and a 72.5% success rate in predicting four-year graduation. In comparison, the overall accuracy of the constant-only model was 53.6%, therefore, the complete model accounted for a 7.3% increase in predictive precision.

However, it is important to note that analyzing the block data confirmed that much of the prediction power can be attributed to the control demographic independent variables. Block one introduced the student's gender, race, and family income in the analysis. The inclusion of these variables increased model accuracy by six percentage points from 53.6% for the null block to 59.6% for block one. There was a mild increase to 59.9% with block two (SAT and High School GPA), and the introduction of financial aid variables in block three lifted the accuracy to 60.1%. The final block with the survey constructs revealed the second largest increase of accuracy, resulting in a final predictive precision of 60.9% for the entire model.

#### **INDIVIDUAL PREDICTOR RESULTS**

Table 4.7 below illustrated the individual Wald statistics, beta coefficients, effect sizes, and significance levels. The Wald criterion revealed that there were a total of six independent variables that demonstrated significant contributions to the prediction. First, Gender ( $p = 0.00$ ) was a significant predictor with  $\text{Exp}(B) = .545$ ; the odds of graduating in four years decrease by 54.5% for males. Furthermore, there was a 13.4% increase in

odds of four year graduation ( $\text{Exp (B)} = 1.134$ ,  $p=.012$ ) for each level increased in parental AGI, and there was a 14.6% ( $\text{Exp (B)} = 1.146$ ,  $p=.019$ ) increase in odds of four year graduation for each unit increased in High School GPA. For each unit increase in SAT performance, there was a highly significant ( $p=0.00$ ) .2% increase in odds of four year graduation ( $\text{Exp (B)} = 1.002$ ). There was near significance for being African American with  $\text{Exp (B)} = .691$  and  $p=.054$ .

There were only two CIRP constructs (factors) that demonstrated significance in the predictive model. First, higher Social Self Concept scores resulted in an 11.3% increase ( $\text{Exp (B)} = 1.113$ ,  $p=.029$ ) in the odds of four year graduation. In addition, larger Likelihood of College Involvement scores enlarged the odd of four year graduation by 11.1% ( $\text{Exp (B)} = 1.111$ ,  $p=.020$ ). Academic Self Concept, Pluralistic Orientation, and Habits of Mind were not significant predictors of four year graduation.

Table 4.7: Wald statistics, beta coefficients, effect sizes, and significance levels of regression analysis

IV	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Gender	-.607	.091	44.296	1	.000*	.545	.456	.652
Latino	-.091	.117	.609	1	.435	.913	.727	1.147
African American	-.370	.192	3.714	1	.054	.691	.474	1.006
Parent AGI	.126	.050	6.245	1	.012*	1.134	1.027	1.251
High School GPA	.137	.058	5.502	1	.019*	1.146	1.023	1.285
SAT	.002	.000	26.783	1	.000**	1.002	1.001	1.002
Loan Total	.000	.000	.597	1	.440	1.000	1.000	1.000
Grant and Scholarship	.000	.000	.187	1	.665	1.000	1.000	1.000
Pell Eligible	-.084	.188	.200	1	.655	.919	.635	1.330
Academic Self Concept	.023	.053	.185	1	.667	1.023	.922	1.134
Social Self Concept	.107	.049	4.742	1	.029*	1.113	1.011	1.226
Likelihood of College Involvement	.105	.045	5.434	1	.020*	1.111	1.017	1.214
Pluralistic Orientation	-.056	.047	1.390	1	.238	.946	.862	1.038
Habits of Mind	-.050	.047	1.091	1	.296	.952	.867	1.044
Constant	-2.087	.802	6.783	1	.009	.124		

## Research Question Examination

### RESEARCH QUESTION 1:

The first research question was intended to measure the extent to which selected groups of CIRP Freshmen Survey questions predicted four year graduation from the University of Texas at Austin. Specifically, this research attempted to answer: What is the predictive relationship between existing Freshmen Survey constructs and four-year



graduation probability among African Americans and Latinos? This topic was explored considering four distinct hypotheses, and the results of each hypothesis is listed below.

**H1:** Predisposition to navigate diversity on campus will have a positive impact on four-year graduation rates. The regression results demonstrated that holding a pluralistic orientation did not significantly (Exp (B) = .946, p=.238) predict four-year graduation. As a result, the null hypothesis was accepted for this item.

**H2:** Predisposition to engage in constructive academic behaviors will have a positive impact on four-year graduation rates. Again, the analysis failed to identify strong habits of mind as a significant (Exp (B) = .952, p=.296) predictor of four-year graduation, and the null hypothesis was accepted.

**H3:** Expectations to participate in post-matriculation academic engagement behaviors will have a positive impact on four-year graduation rates. The regression analysis supported the Likelihood of College Involvement factor as a significant predictor (Exp (B) = 1.111, p=.020) of four year graduation with each unit increase raising the odds of four year graduation by 11.1%. The alternative hypothesis was accepted.

**H4:** Favorable self-concept will have a positive impact on four-year graduation rates. The hypothesis combined Academic Self Concept and Social Self Concept constructs into one measure. The regression results showed that Social Self Concept significantly (Exp (B) = 1.113, p=.029) predicted four-year graduation while Academic Self Concept did not (Exp (B) = 1.023, p=.667). Each unit increase in the Social Self Concept Score was associated with an 11.3% increase in odds of

four-year graduation. Consequently, the alternative hypothesis was partially accepted for Social Self Concept, while the null hypothesis was partially accepted for Academic Self Concept.

In summary, two alternative hypotheses were rejected, one was partially accepted, and one was fully accepted. Expectations to participate in post-matriculation academic engagement behaviors and a favorable social self-concept can increase the accuracy of predicting four-year graduation rates. The combination of these constructs into a single analysis block accounted for the second largest (.8%) increase of accuracy, compared to other blocks. This total predictive precision for the entire model was 60.9%. The results of this research question will be discussed further in chapter five.

#### **RESEARCH QUESTION 2:**

The second research question was: how does the type and amount of financial aid impact the predictive accuracy of select items from the Freshmen Survey? The study hypothesized that more grant would have a greater positive impact on four-year graduation rates than loan aid. Loans (Exp (B) = 1.00,  $p=.440$ ) and grants (Exp (B) = 1.00,  $p=.665$ ) were not shown in this model to be significant predictors of four-year graduation, therefore, the minimal difference in impact between the two types of aid was not significant. In addition, the introduction of these items in the model contributed least (.2%) to the entire model predictive accuracy. As a result, the null hypothesis was accepted. The results of this research question will be discussed further in chapter five.

## **CHAPTER FIVE: DISCUSSION**

### **Overview of the Study**

#### **RATIONALE & PURPOSE**

Increasing national emphasis on college completion and affordability has prompted institutional efforts to focus on increasing efficient degree attainment within four-years. For example, The University of Texas at Austin has shifted from an awarding methodology that is mostly need-based (Student Financial Services, 2011) to one that includes a merit component rooted in standardized academic performance and probability of four-year graduation (Laude, 2013). Allocating discretionary aid based on four-year graduation could result in the enrollment of students with insufficient aid offers, thereby denying these students access to resources that are associated with persistence (Chen & St. John, 2011; DesJardins, Ahlburg, & McCall, 2002; Titus, 2006).

Furthermore, reliance on traditional predictors of four year graduation, Scholastic Achievement Test (SAT) scores and high school grade point average (GPA) (Astin & Oseguera, 2005; Zwick & Himelfarb, 2011), may disproportionately negatively impact the enrollment of African American and Latino students who are more likely to receive lower scores on these metrics (National Center for Education Statistics, 2012; Nord et al., 2011; The College Board, 2012).

This research project sought to identify quantifiable non-academic metrics that can assist to predict bachelor's degree attainment in four years for African Americans and Latinos who do not meet typical standardized testing and scoring predictors. Research has demonstrated that non-cognitive factors can increase the precision of prediction

(Astin & Oseguera 2005, DeAngelo et al., 2011; Gore, 2006; Gore (2), 2006; Robbins et al., 2004). The challenge for an institution is to identify the correct balance of academic and non-academic characteristics that can be used to enroll a diverse class capable of graduating in four-years. This research project specifically asked:

RQ1: What is the predictive relationship between select Freshmen Survey constructs and four-year graduation probability among African Americans and Latinos at The University of Texas at Austin?

RQ2: How does the type and amount of financial aid impact the predictive accuracy of select items from the Freshmen Survey?

#### **METHOD AND ANALYSIS**

The primary guiding theoretical framework employed in data analysis was Astin's I-E-O model, which proposes that individual pre-matriculation student characteristics combined with environmental factors interact to produce outcomes (Astin, 1970, 1991). The research questions were explored with a quantitative analysis of select factors from the 2008 CIRP Freshmen Survey that were determined to be associated with predisposition to navigate diversity on campus, predisposition to engage in constructive academic behaviors, student expectations of academic engagement, and a favorable self-concept. A factor analysis was performed to replicate the CIRP constructs associated with habits of mind, pluralistic orientation, likelihood of college involvement, academic self-concept, and social self-concept. These variables were analyzed along with an array of independent variables associated with race, gender, family income, high school academic

performance, and first-year financial aid data. The dependent variable measured was degree completion in four years.

This study utilized binary logistic regression to analyze the extent to which the independent variables affect and predict the dependent variable outcome. All analyses were performed using IBM SPSS Statistics 21 predictive analytics software, and an alpha level of .05 was employed to assess statistical significance. Frequencies and descriptive statistics were evaluated, and a correlational analysis was performed to understand the relationship between each entered independent variable and the dependent variable.

The independent variables were categorized into blocks in a manner that reflected Astin's I-E-O model. Potentially confounding variables related to race, gender, and income were placed in one block, academic performance in the second block, and financial aid in the next block. The construct scores were positioned into a final block. Chi square, Hosmer and Lemeshow, and Naglkerke's  $R^2$  test results were analyzed to assess the overall model fit. In addition, Wald statistics, beta coefficients, effect sizes, and significance levels were examined to determine the individual predictor accuracy.

## **Discussion of Findings**

### **FINDING ONE: CONTROL VARIABLES GENERALLY SUPPORTED**

The first finding of this research study was that the control independent variables selected contributed significantly to the predictive accuracy of the model.. Specifically, SAT and high school GPA were significant ( $p=0.00$  and  $p=.019$ , respectively) predictors of four-year degree attainment. These conclusions supported research conducted by the College Board that has validated the use of their standardized test (SAT) and high school

GPA to predict academic success (The College Board, 2012). In addition, this finding corresponded well with Astin and Oseguera's (2005) research that found the highest four-year graduation rates among students with high school GPAs of either A or B as well as for those with SAT scores higher than 1100.

Furthermore, parental adjusted gross income (AGI) was determined to be a strong predictor ( $p=.012$ ) of four-year graduation. Prior investigations in persistence research have shown that students with low-socioeconomic backgrounds have a 55% less chance of persisting than their high-socioeconomic peers (Chen & St. John, 2011). The odds of attaining a college degree within six years are significantly lower for those individuals with unmet financial need (Titus, 2006). In addition to parental AGI, gender was a significant predictor ( $p=.000$ ) of four-year graduation. This is also an anticipated result considering that females, regardless of race, consistently outperform their male peers in four-year graduation success (Bowen, Chingos, & McPherson, 2009).

Interestingly, ethnicity was not a statistically significant predictor of four-year graduation. This was an unexpected finding due to the prior research that has highlighted the disparity in degree attainment among African Americans and Latinos. Compared to Anglo Americans males, Latino males are ten percentage points (eight for Latinas) less likely to graduate in four years while African Americans males are sixteen percentage points (eleven for females) less likely (Bowen, Chingos, & McPherson, 2009).

There are a number of possible factors that may account for the absence of this race effect. First, prior research projects may have examined populations that held a more extensive range of academic preparation and ability than that of the population at The

University of Texas at Austin, an elite public research institution that primarily admits students that are at the top of their graduating high school class. For example, Bowen, Chingos, & McPherson (2009) analyzed over twenty public universities and four statewide higher education systems, of which there was likely wide disparity in student caliber.

Furthermore, this study did not attempt to replicate the environmental characteristics of the institutions evaluated by Bowen, Chingos, & McPherson (2009). As stated earlier, there are a number of environmental factors that can affect student outcomes. It is possible that the students examined at UT Austin may have received more intensive academic support while on campus, compared to those of prior studies, but this is speculative at best. Still, predisposition to not complete a degree in four years might have been masked by not controlling for these confounding variables.

#### **FINDING TWO: PARTICIPATION EXPECTATIONS SIGNIFICANCE**

A regression analysis performed on CIRP Freshman survey data by the Higher Education Research Institute had identified a variety of non-academic indicators associated with four-year graduation (DeAngelo et al., 2011), hence, this research study attempted to measure similar items on a more current version of the same survey. The Likelihood of College Involvement factor was supported by this study as a statistically significant predictor of four year graduation.

This result was expected considering the plethora of research and theories, such as Tinto's theory of student departure and Pascarella's general model for assessing change, that both support the benefits of engagement (Pascarella & Terenzini, 2005). The primary

theoretical foundation of this study, Astin's input-environment-outcome (I-E-O) model, emphasizes the importance of the environment students experience on- and off-campus through contact with people, programs, policies, and cultures. Additionally, research has highlighted the importance of living on-campus (Pike & Kuh, 2005), teacher and peer interactions (Meeuwisse, Severiens, & Born, 2010), and student collaboration with faculty on research-related projects in promoting academic success.

### **FINDING THREE: SELF-CONCEPT PARTIALLY SIGNIFICANT**

The results of the analysis failed to assign predictive significance to the academic self-concept factor ( $p=.667$ ), but there was significant predictive value allotted to the social self-concept ( $p=.029$ ) factor. The partial predictive success of social self-concept is supported by prior research that has highlighted the importance of self-efficacy in promoting academic success (Turner, Chandler, & Heffer, 2009), which can be positively impacted by the establishment and maintenance of interpersonal relationships and through emotional wellness (Upcraft & Gardner, 1989). Holding a firm social self-concept may serve to establish sufficient motivation for students to participate in academic support programs that are associated with academic success, such as first-year seminars (Schell & Doetkott, 2002), learning communities (Zhao & Kuh, 2004), and mentoring (Campbell & Campbell, 2007).

The insignificance of the academic self-concept measure as a predictor was unanticipated. Prior research has demonstrated that African Americans and Latinos commonly encounter prevailing peer and faculty tendencies to classify racial minorities and first-generation students as intellectually inferior and academically unqualified



(Rendón, 1994). Additionally, validation of educational capacity positively influences students by increasing their confidence in their ability to learn and their feelings of self-worth.

The academic self-concept factor did not appear to conform well to prior research, but it is possible that the latent trait measured by this construct was not sufficiently robust to accurately measure academic validation for students with disparate educational paths. For example, the self-ratings of academic ability, drive to achieve, mathematical ability, and academic self-concept may not correspond well with the academic preparation necessary for a Philosophy, Government, or Communications degree plan. In comparison, it may more effectively gauge confidence for Natural Science or Engineering majors. Unfortunately, this research project did not control for major chosen in the regression analysis.

#### **FINDING FOUR: ACADEMIC BEHAVIORS AND DIVERSITY PREDISPOSITION INSIGNIFICANT**

The regression analysis did not assess predictive significance ( $p=.296$ ) for the habits of mind factor. This result contradicts numerous studies that have validated the effectiveness of college readiness to promote college degree attainment (Engberg & Wolniak, 2010; Warburton, Bugarin, & Nuñez, 2001). The acquisition of cognitive strategies such as problem solving, accuracy, reasoning, research, self-awareness, self-monitoring, and self-control has been shown to positively impact college performance (Conley, 2008). This specific theme was explored because of the difficulty that African Americans and Latinos encounter in securing the necessary academic preparation to

transition to college (Bozick & DeLuca, 2005; Perna & Titus, 2005; Roderick, Coca, & Nagaoka, 2011; Venezia, Kirst, & Antonio, 2003).

Nevertheless, the lack of significance in the Habits of Mind factor may have resulted from two specific items. First, the influence of predisposition to positive academic behavior could be minimized when the academic intensity is substantially rigorous, such as is the case at a Tier-I research institution like The University of Texas. As mentioned earlier, controlling for major chosen in this study could have influenced the results for this particular factor due to the variance in curriculum among colleges.

In addition, the lack of significance for Habits of Mind may have been the result of inaccurate self-assessments. The University of Texas at Austin enrolls students from high schools across the state, and the academic performance of individuals at these schools varies substantially. It is possible that students included in this research project that attended traditionally low performing schools might have inadvertently overestimated their academic strength because the overall performance of their peers was less meritorious compared to those attending a high performing school. The responses to the questions in this factor may have been different had the respondents has assessed their ability in comparison to peers at orientation.

Next, as was the case for the Habits of Mind factor, the regression analysis showed that the Pluralistic Orientation factor was not statistically significant ( $p=.238$ ) as a predictor of four-year graduation. Propensity to navigate a diverse environment was expected to be beneficial for students that attend a college with relatively low racial diversity. Prior research has brought to light the positive effects of exposure to diverse

environments. Students of all races experience more productive, diverse, and complex learning in diverse educational environments through exposure to high degrees of novelty and interaction (Gurin, 1999). In addition, the informal interactions that occur at college with members of a different race positively affect intellectual engagement and self-assessed academic skills (Gurin, Dey, Hurtado, & Gurin, 2002; Locks, Hurtado, Bowman, & Oseguera, 2008). On the contrary, students of color who experience high levels of discrimination on campus are negatively impacted through reduced academic and intellectual development, grade point averages, persistence, and institutional commitment (Nora & Cabrera, 1996).

The lack of significance for pluralistic orientation as a four-year graduation predictor does not necessarily discredit it as a beneficial quality. Instead, the negative impact of a hostile environment may effectively delay the realization of this advantage until past the four-year graduation timeline. In other words, this attribute might help students to graduate in five or six years, which was a measure beyond the focus of this research project.

Another possible explanation of the pluralistic orientation result was that the need for such a characteristic was minimal at The University of Texas. The lack of significance for this variable may simply be indicative of a racial climate at The University of Texas at Austin that, while certainly not void of problems, is not nearly as hostile as those examined in the aforementioned research. In this scenario, having the ability to overcome an intolerant community will not necessarily contribute to the predictive model.

#### **FINDING FIVE: TYPE AND AMOUNT OF FINANCIAL AID INSIGNIFICANT**

The regression results indicated that loans and grants were not significant predictors of four-year graduation with  $p=.440$  for loans,  $p=.655$  for grants and scholarships, and  $p=.919$  for Pell grant eligibility. This finding contradicts what would be expected when bearing in mind the research related to the importance of financial aid in degree attainment. Prior studies have concluded that one percent increases in the ratio of need-based aid-to-tuition resulted in a 2% increase in the odds of persistence (Chen & St. John, 2011). Merit-based grant money has been shown to be effective at preventing stop-outs, while student loans marginally promote stop-outs (DesJardins, Ahlburg, & McCall, 2002). Reducing stop-outs has a positive impact on graduation rates. Every \$100 increase in student loans raises stop-out odds by 3%, while a \$100 increase in merit add decreases stop-out odds by 10%.

The insignificance of these items, while unexpected, were not surprising considering the complexity of financial aid. There are hundreds of individual scholarship, grant, and loan programs at The University. Incorporating the numerous financial aid programs into only two independent variables incorrectly assumes homogeneity among the eligibility requirements of each program. Instead, there might be an advantage to expanding the independent variables for this topic to analyze individual programs. For example, there could be a distinct variable for need-based grants, merit-based grants, merit-based scholarships, and need-based scholarships. Such an approach would allow for more precise analysis of discrete financial aid programs.

Moreover, the lack of significance for grants/scholarships and loans might have stemmed from only considering the first year of financial aid. Evaluating only one year may be sufficient to establish an initial indicator of need; however, this approach lacks sensitivity to the disparity that can occur in the types and amounts of aid each year. For example, the federal or state government may eliminate a program during a student's sophomore year, thereby creating a substantial hurdle to on-time degree completion.

Lastly, these variables may have lacked significance because the awarding policies of the Office of Student Financial Services allowed for mass-distribution of need-based financial aid to most students that demonstrated financial need. Consequently, the independent variable (grants and scholarships) may have been present among both students that graduated and those that did not graduate in four years. This appeared to be the case based on a subsequent analysis of the graduation rates of those with grants/scholarships that revealed there was only a 4% difference between completion and non-completion within four years. Put another way, it is difficult to understand the impact of these programs if they were received by most students.

## **Implications for Research, Practice, and Policy**

### **IMPLICATIONS FOR RESEARCH**

The results of this study offered support for traditional predictors of four-year graduation, such as SAT scores, and it identified two non-academic factors that were associated with this timely degree completion. At the same time, three factors did not demonstrate similar statistical significance. This research project examined five factors that represented only twenty-nine survey items out of more than two hundred individual

data fields. Simply put, there is substantially more data that can be researched to isolate additional predictive variables. For example, the CIRP Freshmen Survey includes items that attempt to assess student motivation to attend college. Understanding the source of motivation for a student's decision to attend school may provide insight to the extent of engagement that can be expected when a student arrives on campus. This survey provides comprehensive non-academic data that can shed light on a number of higher education-related topics, and future research projects should attempt to consider how these variables may add depth to their findings.

Furthermore, the results of this study did not find significance in distinct race-based demographics. This lack of predictive ability may reflect the heterogeneous student population characteristics that exist at disparate institutional types. For example, a school with strong academic credentials and a national reputation may more effectively recruit well-prepared, affluent underrepresented students than an average open-admission state college. Future research should use caution in assuming that national trend data is applicable when examining a single institution with a sufficiently unique population.

Next, the findings related to type and amount of financial aid may suggest that additional research is required to understand the true impact of financial aid on degree progression. Prior research has validated the positive effect that aid has had on completion; still, research has tended to group types of aid into broad categories with little consideration for the distinctive programs that comprise those groupings. For instance, the wide-ranging variables used for grants and scholarships in this study included some grants that required a 2.0 GPA to renew while some grants necessitated a 3.25 for renewal. Also, loan amounts received are impacted by student choice, loan limits, and loan eligibility criteria. The complexity of financial aid may complicate consideration of these details, but these details might provide important insight to the

effects of financial aid that are associated with more defined, smaller populations. Future research is needed to explore financial aid in greater light than merely type and amount; instead, it should attempt to analyze and be sensitive to the requirements and trends of receipt for each financial aid program.

### **IMPLICATIONS FOR PRACTICE**

The national imperative to reduce college costs and increase completion may prompt higher education institutions to restrict access for students that have low four-year graduation probability (DeAngelo et al., 2011; Hossler, 2000). At the same time, administrators must remain sensitive to the diversity of their school's student body. The results of this research study suggest that the consideration of even a small number of student self-reported non-academic data may positively contribute to predicting four-year graduation. This finding offers administrators additional predictive precision that can perhaps assist in fulfilling both mandates to decrease time-to-degree while preserving diversity.

The significant factors, social self-concept and likelihood of college involvement offer additional value to administrators that extends beyond simply predicting college completion. These items could be used to identify students with the potential to struggle in making a connection to academic support programs and their college environment. Early identification of at-risk students could perhaps trigger additional outreach efforts to ensure that students sufficiently connect to and engage in these programs. Also, the data collected from this study may assist secondary schools to better prepare students for the higher education environment. High schools could develop programs to help students acquire the specific skills that are associated with a high social self-concept and likelihood of college involvement score.

Furthermore, social self-concept and likelihood of college involvement offer support for institutional efforts that focus on non-academic factors, especially those typically positioned under Student Affairs units. The significant factors revealed by this study were composed of questions pertaining to actions such as volunteering, studying abroad, participating in clubs, and leadership/public speaking activities. Past research has validated the importance of non-academic factors, and this study substantiates prior findings that connected these factors to academic success. Validation of these items can be especially important as schools assess the value of allocating funds to non-academic programs.

#### **IMPLICATIONS FOR POLICY**

This study provided an example of a research-based model that ultimately was capable of increasing the accuracy of four-year graduation prediction by 7.3%, even though less than 1% of this predictive power could be attributed to the CIRP Freshmen Survey non-academic variables. Policy makers should be particularly interested in the possibility that a standardized method can be developed for higher education institutions to better identify the students that may require additional assistance to attain a degree in four years. In addition, the predictive accuracy of the CIRP factors offers policy makers an alternative perspective on assessment of college-readiness. The typical measures of college readiness and academic success rely on standardized test scores. The results of this study may serve as a minor example of how measurement of ability could be mildly improved based on an individual's predisposition for academic engagement and strong social self-concept.



## **Limitations of Study**

This results of this research project should be evaluated considering a number of limitations. First, the inherent weakness of a study that measures four-year outcomes is that the base year data will always be at least four years old. This study reviewed survey data and demographic variables that were collected in 2008, and this lapse in time may weaken the applicability of that data to the contemporary environment. Second, this research relied on Astin's I-E-O model as the theoretical framework, yet, the regression analysis conducted only accounted for a limited number of independent variables to constitute the input and environment blocks of the model. It is important to interpret these results considering that the effects of the significant predictors could possibly diminish or be masked with the addition of extra independent variables, such as participation in learning communities or mentoring programs.

Third, this study relied on data collection from a single existing survey mechanism designed to measure a variety of latent traits, so the results might vary with an alternative survey instrument. Fourth, the findings of this study may lack applicability to less selective and lower priced institutions. Lastly, the two significant independent variables related to the CIRP constructs only contributed minimally to the overall predictive power of the model. In addition, the overall significance occurred in combination with other independent variables with proven ability to predict, such as SAT scores. Hence, the CIRP survey items should not be used in isolation when attempting to predict four-year graduation, nor should they be used as a definitive measure of the latent trait assessed.

## **Review of Significance and Contributions of Study**

This study was designed with the intent to significantly contribute to the ongoing dialogue related to efficiency and affordability in higher education. Specifically, the expectation was that the identification of strong non-academic four-year graduation predictors could assist colleges enroll a more diverse group of students with a reasonable chance of receiving their diploma within four years. The findings of the study demonstrated that two out of five non-academic measures demonstrated a statistical significance with mild predictive power.

The identification of two non-academic variables, even though there is a small predictive power, serves as evidence that there is value in exploring alternative methods to forecast which students can complete their degree within four years. The literature review conducted in this study identified numerous institutional characteristics and student behaviors that can promote successful degree completion. This study by no means analyzed the effect of all those items. Furthermore, the CIRP Freshman Survey includes an array of individual questions and constructs that were also not explored by this study. It is unlikely that the complexity of dynamics that impact student success could be explained and quantified with one research project. Ultimately, this study was a necessary and significant step in a sequence of future studies that must occur to achieve a comprehensive method to identify and evaluate each student's formula and timeline for academic success.

## **Concluding Thoughts**

Attaining a Bachelor's degree in a four-year time frame can positively influence degree attainment while reducing the total cost of an education. This research study offered a glimpse into the intricacies of persistence to degree attainment, and understating these complexities is essential to more precise forecasting of potential to attain a degree in four years. Though, the recognition of the multifaceted process of barriers to graduation should also prompt policy makers, administrators, the public, families, and students to interrogate the concept of degree completion within a prescribed timeframe.

The finding of this study validated discrepancies in degree attainment due to academic metrics, gender, and family income. Astin recognized the importance of input variables in the equation that leads to disparate outcomes. At the same time, there is not a magic formula that will eliminate and balance unequal access to quality education and resources. Therefore, while four year degree attainment can be advantageous, it should not be absolutely pursued at the expense of those students that are simply not sufficiently prepared to encounter and navigate the rigors of an intense and complex academic environment. Loss of educational opportunity is not a temporary moment of adversity; rather, it is unfortunately too closely associated with a lifetime of hardship.

The consequences of not receiving a higher education are especially devastating to underrepresented populations; they experience high levels of poverty, unemployment, and health-related difficulties (Egerter et al., 2009; Julian & Kominski, 2011; United States Department of Health and Human Services, 2012; United States Bureau of Labor Statistics, 2012). The economic losses associated with not attaining a degree within six years have been estimated to be as high as \$3.8 billion in income, \$566 million in federal income taxes, and \$164 million in state income taxes (Schneider & Yin, 2011).

Additionally, students who do not complete college incur a median debt of \$7,000, and nearly one quarter of these borrowers eventually default on their student loans (Gladieux & Perna, 2005). On the other hand, degree attainment positively influences an individual's intellectual capacity, monetary gains, physical and mental health, and overall satisfaction (Pascarella & Terenzini, 2005; Astin, 1990).

The contemporary reality is that higher education access is becoming more restrictive for students that fail to achieve sufficient standardized academic measures, and simply put, there are students that will achieve success in four years even though their SAT score says otherwise. For example, the author of this study scored a 980 on his SAT test and graduated in exactly four years with 120 hours. Higher education is the most powerful gift that we can pass on to our children. It is the tool that prompts critical thought, understanding, innovation, vision, and enables us to engage in meaningful discourse with both our allies and adversaries. It allows recognition of our reason for being, and it cultivates our ability to change the world. This is a power that must be attainable by all, regardless of race, gender, or economic status.

# APPENDIX A: 2008 CIRP FRESHMEN SURVEY

## 2008 CIRP FRESHMAN SURVEY

PLEASE PRINT NAME AND PERMANENT/HOME ADDRESS (one letter or number per box).

	FIRST	MI	LAST	When were you born?		
NAME:	<input style="width: 100%; height: 15px;" type="text"/>			<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>
ADDRESS:	<input style="width: 100%; height: 15px;" type="text"/>					
CITY:	STATE:	ZIP:	PHONE:	-	-	-
STUDENT ID# (as instructed):		EMAIL (print letters carefully):				
<input style="width: 100%; height: 15px;" type="text"/>						

SERIAL #

**MARKING DIRECTIONS**

- Use a #2 pencil or black or blue pen.
- Erase cleanly any answer you wish to change or "X" out mark if in pen.

**CORRECT MARK**    **INCORRECT MARKS**

**Group Code**    **A**    **B**

1. Your sex:     Male     Female
2. How old will you be on December 31 of this year? (Mark one)
 

16 or younger . . . . .	<input type="radio"/>	21-24 . . . . .	<input type="radio"/>
17 . . . . .	<input type="radio"/>	25-29 . . . . .	<input type="radio"/>
18 . . . . .	<input type="radio"/>	30-39 . . . . .	<input type="radio"/>
19 . . . . .	<input type="radio"/>	40-54 . . . . .	<input type="radio"/>
20 . . . . .	<input type="radio"/>	55 or older . . . . .	<input type="radio"/>
3. Is English your native language?
 

<input type="radio"/> Yes	<input type="radio"/> No
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4. In what year did you graduate from high school? (Mark one)
 

2008 . . . . .	<input type="radio"/>	Did not graduate but passed G.E.D. test . . . . .	<input type="radio"/>
2007 . . . . .	<input type="radio"/>	Never completed high school . . . . .	<input type="radio"/>
2006 . . . . .	<input type="radio"/>		
2005 or earlier . . . . .	<input type="radio"/>		
5. Are you enrolled (or enrolling) as a: (Mark one)
 

Full-time student? . . . . .	<input type="radio"/>
Part-time student? . . . . .	<input type="radio"/>
6. How many miles is this college from your permanent home? (Mark one)
 

5 or less . . . . .	<input type="radio"/>	11-50 . . . . .	<input type="radio"/>	101-500 . . . . .	<input type="radio"/>
6-10 . . . . .	<input type="radio"/>	51-100 . . . . .	<input type="radio"/>	Over 500 . . . . .	<input type="radio"/>
7. What was your average grade in high school? (Mark one)
 

A or A+ . . . . .	<input type="radio"/>	B . . . . .	<input type="radio"/>	C . . . . .	<input type="radio"/>
A- . . . . .	<input type="radio"/>	B- . . . . .	<input type="radio"/>	D . . . . .	<input type="radio"/>
B+ . . . . .	<input type="radio"/>	C+ . . . . .	<input type="radio"/>		
8. What were your scores on the SAT I and/or ACT?
 

SAT VERBAL . . . . .	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>
SAT MATH . . . . .	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>
SAT WRITING . . . . .	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>
ACT Composite . . . . .	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>	<input style="width: 20px; height: 15px;" type="text"/>

9. From what kind of high school did you graduate? (Mark one)
  - Public school (not charter or magnet)
  - Public charter school
  - Public magnet school
  - Private religious/parochial school
  - Private independent college-prep school
  - Home school
10. Prior to this term, have you ever taken courses for credit at this institution?
 

<input type="radio"/> Yes	<input type="radio"/> No
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11. Since leaving high school, have you ever taken courses, whether for credit or not for credit, at any other institution (university, 4- or 2-year college, technical, vocational, or business school)?
 

<input type="radio"/> Yes	<input type="radio"/> No
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12. Where do you plan to live during the fall term? (Mark one)
  - With my family or other relatives . . . . .
  - Other private home, apartment, or room . . . . .
  - College residence hall . . . . .
  - Fraternity or sorority house . . . . .
  - Other campus student housing . . . . .
  - Other . . . . .
13. To how many colleges other than this one did you apply for admission this year?
 

None	<input type="radio"/>	1	<input type="radio"/>	4	<input type="radio"/>	7-10	<input type="radio"/>
	<input type="radio"/>	2	<input type="radio"/>	5	<input type="radio"/>	11 or more	<input type="radio"/>
	<input type="radio"/>	3	<input type="radio"/>	6	<input type="radio"/>		
14. Were you accepted by your first choice college?
 

<input type="radio"/> Yes	<input type="radio"/> No
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15. Is this college your: (Mark one)
 

First choice? . . . . .	<input type="radio"/>	Less than third choice? . . . . .	<input type="radio"/>
Second choice? . . . . .	<input type="radio"/>	Third choice? . . . . .	<input type="radio"/>
16. Citizenship status:
  - U.S. citizen
  - Permanent resident (green card)
  - Neither
17. Are your parents: (Mark one)
  - Both alive and living with each other? . . . . .
  - Both alive, divorced or living apart? . . . . .
  - One or both deceased? . . . . .

18. During high school (grades 9-12) how many years did you study each of the following subjects? (Mark one for each item)
 

	None	1	2	3	4	5 or more
English . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematics . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Foreign Language . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Science . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biological Science . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
History/Am. Gov't . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer Science . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arts and/or Music . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. What is the highest academic degree that you intend to obtain? (Mark one in each column)
 

	None	Highest Planned at This College	Highest Planned at This College
None . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vocational certificate . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Associate (A.A. or equivalent) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bachelor's degree (B.A., B.S., etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Master's degree (M.A., M.S., etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ph.D. or Ed.D. . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
M.D., D.O., D.D.S., or D.V.M. . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
J.D. (Law) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B.D. or M.Div. (Divinity) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. How would you describe the racial composition of the high school you last attended and the neighborhood where you grew up? (Mark one in each row)
 

	Completely Non-White	Mostly Non-White	Some Non-White	Mostly White	Completely White
High school I last attended . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Neighborhood where I grew up . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Do you have a disability? (Mark all that apply)
 

<input type="radio"/> None	<input type="radio"/> Learning disability
<input type="radio"/> Hearing	<input type="radio"/> Partially sighted or blind
<input type="radio"/> Speech	<input type="radio"/> Health-related
<input type="radio"/> Orthopedic	<input type="radio"/> Other

22. How much of your first year's educational expenses (room, board, tuition, and fees) do you expect to cover from each of the sources listed below?

(Mark one answer for each possible source)

	None	Less than \$1,000	\$1,000 to 2,999	\$3,000 to 5,999	\$6,000 to 9,999	\$10,000+
Family resources (parents, relatives, spouse, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My own resources (savings from work, work-study, other income) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aid which need <u>not</u> be repaid (grants, scholarships, military funding, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aid which <u>must</u> be repaid (loans, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other than above . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. What is your best estimate of your parents' total income last year? Consider income from all sources before taxes. (Mark one)

<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000-59,999
<input type="radio"/> \$10,000-14,999	<input type="radio"/> \$60,000-74,999
<input type="radio"/> \$15,000-19,999	<input type="radio"/> \$75,000-99,999
<input type="radio"/> \$20,000-24,999	<input type="radio"/> \$100,000-149,999
<input type="radio"/> \$25,000-29,999	<input type="radio"/> \$150,000-199,999
<input type="radio"/> \$30,000-39,999	<input type="radio"/> \$200,000-249,999
<input type="radio"/> \$40,000-49,999	<input type="radio"/> \$250,000 or more

24. Do you have any concern about your ability to finance your college education? (Mark one)

None (I am confident that I will have sufficient funds) . . . . .

Some (but I probably will have enough funds) . . . . .

Major (not sure I will have enough funds to complete college) . . . . .

25. Current religious preference: (Mark one in each column)

	Yours	Father's	Mother's
Baptist . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buddhist . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Church of Christ . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eastern Orthodox . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Episcopalian . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hindu . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jewish . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LDS (Mormon) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lutheran . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methodist . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Muslim . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Presbyterian . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quaker . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roman Catholic . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seventh Day Adventist . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
United Church of Christ/Congregational . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Christian . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Religion . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
None . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. For the activities below, indicate which ones you did during the past year. If you engaged in an activity frequently, mark (F). If you engaged in an activity one or more times, but not frequently, mark (O) (Occasionally). Mark (N) (Not at all) if you have not performed the activity during the past year. (Mark one for each item)

	Frequently	Occasionally	Not at All
Attended a religious service . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was bored in class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participated in political demonstrations . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tutored another student . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studied with other students . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was a guest in a teacher's home . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked cigarettes . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank beer . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank wine or liquor . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all I had to do . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt depressed . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed volunteer work . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Played a musical instrument . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asked a teacher for advice after class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Voted in a student election . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socialized with someone of another racial/ethnic group . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Came late to class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used the Internet:			
For research or homework . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To read news sites . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To read blogs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To blog . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed community service as a part of a class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed religion . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed politics . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked on a local, state, or national political campaign . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (Mark one in each row)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Academic ability . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artistic ability . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer skills . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperativeness . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive to achieve . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional health . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership ability . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematical ability . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Popularity . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public speaking ability . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (Intellectual) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (social) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-understanding . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of others . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing ability . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (Mark one for each item)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Ability to see the world from someone else's perspective . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tolerance of others with different beliefs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Openness to having my own views challenged . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to discuss and negotiate controversial issues . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to work cooperatively with diverse people . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. What is the highest level of formal education obtained by your parents? (Mark one in each column)

	Father	Mother
Grammar school or less . . . . .	<input type="radio"/>	<input type="radio"/>
Some high school . . . . .	<input type="radio"/>	<input type="radio"/>
High school graduate . . . . .	<input type="radio"/>	<input type="radio"/>
Postsecondary school other than college . . . . .	<input type="radio"/>	<input type="radio"/>
Some college . . . . .	<input type="radio"/>	<input type="radio"/>
College degree . . . . .	<input type="radio"/>	<input type="radio"/>
Some graduate school . . . . .	<input type="radio"/>	<input type="radio"/>
Graduate degree . . . . .	<input type="radio"/>	<input type="radio"/>

30. How often in the past year did you? (Mark one for each item)

	Frequently	Occasionally	Not at All
Ask questions in class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support your opinions with a logical argument . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seek solutions to problems and explain them to others . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Revise your papers to improve your writing . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluate the quality or reliability of information you received . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take a risk because you feel you have more to gain . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seek alternative solutions to a problem . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Look up scientific research articles and resources . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Explore topics on your own, even though it was not required for a class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accept mistakes as part of the learning process . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seek feedback on your academic work . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take notes during class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. Mark only three responses, one in each column.

	<b>M</b>	<b>F</b>	<b>M</b>
	<b>Y</b>	<b>F</b>	<b>M</b>
	<b>Y</b>	<b>F</b>	<b>M</b>
	<b>Y</b>	<b>F</b>	<b>M</b>
Accountant or actuary . . . . .	Y	F	M
Actor or entertainer . . . . .	Y	F	M
Architect or urban planner . . . . .	Y	F	M
Artist . . . . .	Y	F	M
Business (clerical) . . . . .	Y	F	M
Business executive (management, administrator) . . . . .	Y	F	M
Business owner or proprietor . . . . .	Y	F	M
Business salesperson or buyer . . . . .	Y	F	M
Clergy (minister, priest) . . . . .	Y	F	M
Clergy (other religious) . . . . .	Y	F	M
Clinical psychologist . . . . .	Y	F	M
College administrator/staff . . . . .	Y	F	M
College teacher . . . . .	Y	F	M
Computer programmer or analyst . . . . .	Y	F	M
Conservationist or forester . . . . .	Y	F	M
Dentist (including orthodontist) . . . . .	Y	F	M
Dietitian or nutritionist . . . . .	Y	F	M
Engineer . . . . .	Y	F	M
Farmer or rancher . . . . .	Y	F	M
Foreign service worker (including diplomat) . . . . .	Y	F	M
Homemaker (full-time) . . . . .	Y	F	M
Interior decorator (including designer) . . . . .	Y	F	M
Lab technician or hygienist . . . . .	Y	F	M
Law enforcement officer . . . . .	Y	F	M
Lawyer (attorney) or judge . . . . .	Y	F	M
Military service (career) . . . . .	Y	F	M
Musician (performer, composer) . . . . .	Y	F	M
Nurse . . . . .	Y	F	M
Optometrist . . . . .	Y	F	M
Pharmacist . . . . .	Y	F	M
Physician . . . . .	Y	F	M
Policymaker/Government . . . . .	Y	F	M
School counselor . . . . .	Y	F	M
School principal or superintendent . . . . .	Y	F	M
Scientific researcher . . . . .	Y	F	M
Social, welfare, or recreation worker . . . . .	Y	F	M
Therapist (physical, occupational, speech) . . . . .	Y	F	M
Teacher or administrator (elementary) . . . . .	Y	F	M
Teacher or administrator (secondary) . . . . .	Y	F	M
Veterinarian . . . . .	Y	F	M
Writer or journalist . . . . .	Y	F	M
Skilled trades . . . . .	Y	F	M
Laborer (unskilled) . . . . .	Y	F	M
Semi-skilled worker . . . . .	Y	F	M
Unemployed . . . . .	Y	F	M
Other . . . . .	Y	F	M
Undecided . . . . .	Y		

32. How would you characterize your political views? (Mark one)

- Far left
- Liberal
- Middle-of-the-road
- Conservative
- Far right

33. Mark one in each row:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	<b>Disagree Strongly</b>	<b>Disagree Somewhat</b>	<b>Agree Somewhat</b>	<b>Agree Strongly</b>
There is too much concern in the courts for the rights of criminals . . . . .	4	3	2	1
Abortion should be legal . . . . .	4	3	2	1
The death penalty should be abolished . . . . .	4	3	2	1
Marijuana should be legalized . . . . .	4	3	2	1
It is important to have laws prohibiting homosexual relationships . . . . .	4	3	2	1
Racial discrimination is no longer a major problem in America . . . . .	4	3	2	1
Realistically, an individual can do little to bring about changes in our society . . . . .	4	3	2	1
Wealthy people should pay a larger share of taxes than they do now . . . . .	4	3	2	1
Same-sex couples should have the right to legal marital status . . . . .	4	3	2	1
Affirmative action in college admissions should be abolished . . . . .	4	3	2	1
Federal military spending should be increased . . . . .	4	3	2	1
The federal government should do more to control the sale of handguns . . . . .	4	3	2	1
Only volunteers should serve in the armed forces . . . . .	4	3	2	1
The federal government is not doing enough to control environmental pollution . . . . .	4	3	2	1
A national health care plan is needed to cover everybody's medical costs . . . . .	4	3	2	1
Undocumented immigrants should be denied access to public education . . . . .	4	3	2	1
Through hard work, everybody can succeed in American society . . . . .	4	3	2	1
Dissent is a critical component of the political process . . . . .	4	3	2	1
Colleges have the right to ban extreme speakers from campus . . . . .	4	3	2	1
Students from disadvantaged social backgrounds should be given preferential treatment in college admissions . . . . .	4	3	2	1
The federal government should raise taxes to reduce the deficit . . . . .	4	3	2	1
Addressing global warming should be a federal priority . . . . .	4	3	2	1

34. During your last year in high school, how much time did you spend during a typical week doing the following activities?

	<b>None</b>	<b>Less than 1 hour</b>	<b>1-2</b>	<b>3-5</b>	<b>6-10</b>	<b>11-15</b>	<b>16-20</b>	<b>Over 20</b>
<b>Hours per week:</b>								
Studying/homework . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socializing with friends . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talking with teachers outside of class . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise or sports . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Partying . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working (for pay) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteer work . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student clubs/groups . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watching TV . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Household/childcare duties . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reading for pleasure . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing video/computer games . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online social networks (MySpace, Facebook, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. Are you: (Mark all that apply)

- White/Caucasian . . . . .
- African American/Black . . . . .
- American Indian/Alaska Native . . . . .
- Asian American/Asian . . . . .
- Native Hawaiian/Pacific Islander . . . . .
- Mexican American/Chicano . . . . .
- Puerto Rican . . . . .
- Other Latino . . . . .
- Other . . . . .

36. Below are some reasons that might have influenced your decision to attend this particular college. How important was each reason in your decision to come here? (Mark one answer for each possible reason)

	<b>Very Important</b>	<b>Somewhat Important</b>	<b>Not Important</b>
My parents wanted me to come here . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My relatives wanted me to come here . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My teacher advised me . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This college has a very good academic reputation . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This college has a good reputation for its social activities . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was offered financial assistance . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The cost of attending this college . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High school counselor advised me . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private college counselor advised me . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wanted to live near home . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not offered aid by first choice . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Could not afford first choice . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This college's graduates gain admission to top graduate/professional schools . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This college's graduates get good jobs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was attracted by the religious affiliation/orientation of the college . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wanted to go to a school about the size of this college . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rankings in national magazines . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from a website . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was admitted through an Early Action or Early Decision program . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The athletic department recruited me . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A visit to the campus . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

37. Below is a list of different undergraduate major fields grouped into general categories. Mark only one oval to indicate your probable field of study.

<b>ARTS AND HUMANITIES</b>	<b>PHYSICAL SCIENCE</b>
Art, fine and applied . . . . . 1	Astronomy . . . . . 43
English (language and literature) . . . . . 2	Atmospheric Science (incl. Meteorology) . . . . . 44
History . . . . . 3	Chemistry . . . . . 45
Journalism . . . . . 4	Earth Science . . . . . 46
Language and Literature (except English) . . . . . 5	Marine Science (incl. Oceanography) . . . . . 47
Music . . . . . 6	Mathematics . . . . . 48
Philosophy . . . . . 7	Physics . . . . . 49
Speech . . . . . 8	Other Physical Science . . . . . 50
Theater or Drama . . . . . 9	<b>PROFESSIONAL</b>
Theology or Religion . . . . . 10	Architecture or Urban Planning . . . . . 51
Other Arts and Humanities . . . . . 11	Family & Consumer Sciences . . . . . 52
<b>BIOLOGICAL SCIENCE</b>	Health Technology (medical, dental, laboratory) . . . . . 53
Biology (general) . . . . . 12	Library or Archival Science . . . . . 54
Biochemistry or Biophysics . . . . . 13	Medicine, Dentistry, Veterinary Medicine . . . . . 55
Botany . . . . . 14	Nursing . . . . . 56
Environmental Science . . . . . 15	Pharmacy . . . . . 57
Marine (Life) Science . . . . . 16	Therapy (occupational, physical, speech) . . . . . 58
Microbiology or Bacteriology . . . . . 17	Other Professional . . . . . 59
Zoology . . . . . 18	<b>SOCIAL SCIENCE</b>
Other Biological Science . . . . . 19	Anthropology . . . . . 60
<b>BUSINESS</b>	Economics . . . . . 61
Accounting . . . . . 20	Ethnic Studies . . . . . 62
Business Admin. (general) . . . . . 21	Geography . . . . . 63
Finance . . . . . 22	Political Science (gov't, international relations) . . . . . 64
International Business . . . . . 23	Psychology . . . . . 65
Marketing . . . . . 24	Public Policy . . . . . 66
Management . . . . . 25	Social Work . . . . . 67
Secretarial Studies . . . . . 26	Sociology . . . . . 68
Other Business . . . . . 27	Women's Studies . . . . . 69
<b>EDUCATION</b>	Other Social Science . . . . . 70
Business Education . . . . . 28	<b>TECHNICAL</b>
Elementary Education . . . . . 29	Building Trades . . . . . 71
Music or Art Education . . . . . 30	Data Processing or Computer Programming . . . . . 72
Physical Education or Recreation . . . . . 31	Drafting or Design . . . . . 73
Secondary Education . . . . . 32	Electronics . . . . . 74
Special Education . . . . . 33	Mechanics . . . . . 75
Other Education . . . . . 34	Other Technical . . . . . 76
<b>ENGINEERING</b>	<b>OTHER FIELDS</b>
Aeronautical or Astronautical Eng . . . . . 35	Agriculture . . . . . 77
Civil Engineering . . . . . 36	Communications . . . . . 78
Chemical Engineering . . . . . 37	Computer Science . . . . . 79
Computer Engineering . . . . . 38	Forestry . . . . . 80
Electrical or Electronic Engineering . . . . . 39	Kinesiology . . . . . 81
Industrial Engineering . . . . . 40	Law Enforcement . . . . . 82
Mechanical Engineering . . . . . 41	Military Science . . . . . 83
Other Engineering . . . . . 42	Other Field . . . . . 84
	Undecided . . . . . 85

38. Please indicate the importance to you personally of each of the following: (Mark one for each item)

	<b>N</b> Not Important	<b>S</b> Somewhat Important	<b>V</b> Very Important	<b>E</b> Essential
Becoming accomplished in one of the performing arts (acting, dancing, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming an authority in my field . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obtaining recognition from my colleagues for contributions to my special field . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influencing the political structure . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influencing social values . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Raising a family . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being very well off financially . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helping others who are in difficulty . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making a theoretical contribution to science . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing original works (poems, novels, short stories, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creating artistic works (painting, sculpture, decorating, etc.) . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming successful in a business of my own . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming involved in programs to clean up the environment . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing a meaningful philosophy of life . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in a community action program . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helping to promote racial understanding . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keeping up to date with political affairs . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming a community leader . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving my understanding of other countries and cultures . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adopting "green" practices to protect the environment . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

39. What is your best guess as to the chances that you will: (Mark one for each item)

	<b>N</b> No Chance	<b>L</b> Very Little Chance	<b>S</b> Some Chance	<b>V</b> Very Good Chance
Change major field? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change career choice? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in student government? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get a job to help pay for college expenses? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work full-time while attending college? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Join a social fraternity or sorority? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Play varsity/intercollegiate athletics? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make at least a "B" average? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Need extra time to complete your degree requirements? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in student protests or demonstrations? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transfer to another college before graduating? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be satisfied with your college? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in volunteer or community service work? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seek personal counseling? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicate regularly with your professors? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socialize with someone of another racial/ethnic group? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in student clubs/groups? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participate in a study abroad program? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have a roommate of a different race/ethnicity? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss course content with students outside of class? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work on a professor's research project? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get tutoring help in specific courses? . . . . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. Do you give the Higher Education Research Institute (HERI) permission to include your ID number should your college request the data for additional research analyses? HERI maintains strict standards of confidentiality and would require your college to sign a pledge of confidentiality.

Yes  No

The remaining ovals are provided for questions specifically designed by your college rather than the Higher Education Research Institute. If your college has chosen to use the ovals, please observe carefully the supplemental directions given to you.

41. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	45. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	49. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	53. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	57. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
42. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	46. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	50. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	54. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	58. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
43. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	47. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	51. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	55. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	59. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
44. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	48. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	52. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	56. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	60. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E

**THANK YOU!**



## APPENDIX B: CIRP SURVEY CONSTRUCTS

Habits of Mind				
<i>A unified measure of the behaviors and traits associated with academic success. These learning behaviors are seen as the foundation for lifelong learning.</i>				

TFS, YFCY	A	B1	B2	
Ask questions in class	1.32	-2.58	0.14	
Support your opinions with a logical argument	1.97	-2.32	-0.15	
Seek solutions to problems and explain them to others	2.29	-2.19	0.02	
Revise your papers to improve your writing	1.07	-3.01	-0.01	
Evaluate the quality or reliability of information you received	1.70	-2.35	0.36	
Take a risk because you feel you have more to gain	1.30	-2.34	0.66	
Seek alternative solutions to a problem	1.89	-2.56	0.30	
Look up scientific research articles and resources	0.96	-1.77	1.24	
Explore topics on your own, even though it was not required for a class	1.28	-1.74	0.81	
Accept mistakes as part of the learning process	1.08	-3.87	0.03	
Seek feedback on your academic work	1.38	-2.65	0.10	

Pluralistic Orientation				
<i>Measures skills and dispositions appropriate for living and working in a diverse society.</i>				

TFS, YFCY	A	B1	B2	B3	B4
Ability to see the world from someone else's perspective	1.99	-3.96	-2.68	-0.62	1.07
Tolerance of others with different beliefs	2.52	-3.31	-2.30	-0.78	0.66
Openness to having my own views challenged	2.29	-3.10	-1.93	-0.35	1.11
Ability to discuss and negotiate controversial issues	2.11	-3.46	-2.12	-0.49	0.98
Ability to work cooperatively with diverse people	2.60	-3.45	-2.63	-0.90	0.61

Likelihood of College Involvement				
<i>A unified measure of students' expectations about their involvement in college life generally.</i>				

TFS	A	B1	B2	B3
Socialize with someone of another racial/ethnic group	2.56	-2.24	-1.25	-0.01
Participate in a study abroad program	1.66	-3.15	-1.86	-0.07
Participate in a volunteer or community service work	1.65	-3.35	-2.26	-0.67
Participate in student government	1.52	-2.43	-0.98	0.64
Participate in student clubs/groups	1.21	-2.22	-0.78	0.66

Academic Self-Concept				
<i>A unified measure of students' beliefs about their abilities and confidence in academic environments.</i>				

TFS, YFCY, CSS	A	B1	B2	B3	B4
<b>Self Rating: Academic ability</b>	3.01	-3.57	-2.57	-0.75	0.83
<b>Self Rating: Drive to achieve</b>	1.18	-5.57	-3.51	-1.28	0.73
<b>Self Rating: Mathematical ability</b>	1.14	-3.53	-1.59	0.16	1.98
<b>Self Rating: Self-confidence (intellectual)</b>	1.51	-4.25	-2.47	-0.51	1.29

Social Self-Concept				
<i>A unified measure of students' beliefs about their abilities and confidence in social situations.</i>				

TFS	A	B1	B2	B3	B4
<b>Self Rating: Leadership ability</b>	2.36	-3.26	-1.92	-0.46	0.94
<b>Self Rating: Popularity</b>	1.77	-2.65	-1.19	0.23	1.59
<b>Self Rating: Public speaking ability</b>	1.84	-3.21	-1.61	-0.10	1.37
<b>Self Rating: Self-confidence (social)</b>	1.69	-3.40	-2.03	0.33	2.01

## APPENDIX C: FACTOR DESCRIPTIVE STATISTICS SPSS OUTPUT

Table C1: Academic Self Concept Factor Mean, Standard Deviation, and Number

Item	Mean	Standard Deviation	N
Academic Ability	4.37	.665	2598
Drive To Achieve	4.36	.738	2598
Mathematical Ability	3.85	.938	2598
Self-Confidence (Intellectual)	3.94	.841	2598

Table C2: Academic Self Concept Factor Correlation Matrix

Item	Academic Ability	Drive To Achieve	Mathematical Ability	Self-Confidence (Intellectual)
Academic Ability	1	0.285	0.461	0.464
Drive To Achieve	0.285	1	0.168	0.328
Mathematical Ability	0.461	0.168	1	0.292
Self-Confidence (Intellectual)	0.464	0.328	0.292	1

Note: Determinant = .532, One-tail significance = .000 for all values

Table C3: Academic Self Concept Factor KMO and Bartlett's Test

Test	Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.682
Bartlett's Test of Sphericity	
Approx. Chi-Square	1637.714
df	6
Sig.	.000

Table C4: Social Self Concept Factor Mean, Standard Deviation, and Number

Item	Mean	Standard Deviation	N
Leadership Ability	3.90	.892	2598
Popularity	3.33	.813	2598
Public Speaking Ability	3.37	1.031	2598
Self-Confidence (Social)	3.53	.963	2598

Table C5: Social Self Concept Factor Correlation Matrix

Item	Leadership Ability	Popularity	Public Speaking Ability	Self-Confidence (Social)
Leadership Ability	1.000	.437	.560	.471
Popularity	.437	1.000	.419	.562
Public Speaking Ability	.560	.419	1.000	.458
Self-Confidence (Social)	.471	.562	.458	1.000

Note: Determinant = .315, One-tail significance = .000 for all values

Table C6: Social Self Concept Factor KMO and Bartlett's Test

Test	Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.759
Bartlett's Test of Sphericity	
Approx. Chi-Square	2997.906
df	6
Sig.	.000

Table C7: Pluralistic Orientation Factor Mean, Standard Deviation, and Number

Item	Mean	Standard Deviation	N
Ability To See The World From Someone Else's Perspective	3.99	0.762	2598
Tolerance Of Others With Different Beliefs	4.2	0.784	2598
Openness To Having My Own Views Challenged	3.73	0.918	2598
Ability To Discuss And Negotiate Controversial Issues	3.9	0.872	2598
Ability To Work Cooperatively With Diverse People	4.27	0.721	2598

Table C8: Pluralistic Orientation Factor Correlation Matrix

Item	Ability To See The World From Someone Else's Perspective	Tolerance Of Others With Different Beliefs	Openness To Having My Own Views Challenged	Ability To Discuss And Negotiate Controversial Issues	Ability To Work Cooperatively With Diverse People
Ability To See The World From Someone Else's Perspective	1	0.524	0.409	0.38	0.426
Tolerance Of Others With Different Beliefs	0.524	1	0.483	0.352	0.496
Openness To Having My Own Views Challenged	0.409	0.483	1	0.487	0.381
Ability To Discuss And Negotiate Controversial Issues	0.38	0.352	0.487	1	0.456
Ability To Work Cooperatively With Diverse People	0.426	0.496	0.381	0.456	1

Note: Determinant = .248, One-tail significance = .000 for all values

Table C9: Pluralistic Orientation Factor KMO and Bartlett's Test

Test	Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.795
Bartlett's Test of Sphericity	
Approx. Chi-Square	3621.632
df	10
Sig.	.000

Table C10: Habits of Mind Factor Mean, Standard Deviation, and Number

Item	Mean	Standard Deviation	N
Ask Questions In Class	2.55	.550	2598
Support Your Opinions With A Logical Argument	2.62	.526	2598
Seek Solutions To Problems And Explain Them To Others	2.59	.530	2598
Revise Your Papers To Improve Your Writing	2.47	.593	2598
Evaluate The Quality Or Reliability Of Information You Received	2.44	.564	2598
Take A Risk Because You Feel You Have More To Gain	2.33	.561	2598
Seek Alternative Solutions To A Problem	2.47	.537	2598
Look Up Scientific Research Articles And Resources	2.00	.683	2598
Explore Topics On Your Own, Even Though It Was Not Required For A Class	2.24	.660	2598
Accept Mistakes As Part Of The Learning Process	2.53	.537	2598
Seek Feedback On Your Academic Work	2.50	.585	2598

Table C11: Habits of Mind Factor Correlation Matrix

	Ask Questions	Support Opinions	Seek Solutions	Revise Papers	Evaluate Quality	Take a Risk	Seek Alternatives	Look up Scientific	Explore Topics	Accept Mistakes	Seek Feedback
Ask Questions	1	0.347	0.306	0.221	0.168	0.174	0.211	0.128	0.156	0.129	0.308
Support Opinions	0.347	1	0.449	0.191	0.258	0.192	0.267	0.2	0.265	0.105	0.212
Seek Solutions	0.306	0.449	1	0.239	0.281	0.21	0.357	0.224	0.263	0.182	0.248
Revise Papers	0.221	0.191	0.239	1	0.339	0.148	0.197	0.191	0.167	0.14	0.322
Evaluate Quality	0.168	0.258	0.281	0.339	1	0.285	0.333	0.251	0.298	0.183	0.248
Take a Risk	0.174	0.192	0.21	0.148	0.285	1	0.417	0.208	0.221	0.216	0.187
Seek Alternatives	0.211	0.267	0.357	0.197	0.333	0.417	1	0.268	0.265	0.238	0.244
Look up Scientific	0.128	0.2	0.224	0.191	0.251	0.208	0.268	1	0.418	0.147	0.132
Explore Topics	0.156	0.265	0.263	0.167	0.298	0.221	0.265	0.418	1	0.217	0.189
Accept Mistakes	0.129	0.105	0.182	0.14	0.183	0.216	0.238	0.147	0.217	1	0.289
Seek Feedback	0.308	0.212	0.248	0.322	0.248	0.187	0.244	0.132	0.189	0.289	1

Note: Determinant = .147, One-tail significance = .000 for all values

Table C12: Habits of Mind Factor KMO and Bartlett's Test

Test	Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.829
Bartlett's Test of Sphericity	
Approx. Chi-Square	4963.991
df	55
Sig.	.000

Table C13: Likelihood of College Involvement Factor Mean, Standard Deviation, and Number

Item	Mean	Standard Deviation	N
Socialize With Someone Of Another Racial/Ethnic Group	3.77	.499	2598
Participate In A Study Abroad Program	2.98	.943	2598
Participate In Volunteer Or Community Service Work	3.25	.758	2598
Participate In Student Government	2.37	.917	2598
Participate In Student Clubs/Groups	3.52	.660	2598

Table C14 Likelihood of College Involvement Factor Correlation Matrix

Item	Socialize with Someone	Participate in Study Abroad	Participate in Volunteer	Participate in Stu. Gov.	Participate in Stu. Clubs
Socialize with Someone	1.000	.140	.260	.085	.374
Participate in Study Abroad	.140	1.000	.237	.206	.306
Participate in Volunteer	.260	.237	1.000	.300	.440
Participate in Stu. Gov.	.085	.206	.300	1.000	.326
Participate in Stu. Clubs	.374	.306	.440	.326	1.000

Note: Determinant = .521, One-tail significance = .000 for all values

Table C15: Likelihood of College Involvement Factor KMO and Bartlett's Test

Test	Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.715
Bartlett's Test of Sphericity	
Approx. Chi-Square	1693.659
df	10
Sig.	.000

Table C16: Factor Component Matrix

Factor	Component 1
Academic Self Concept	
Academic Ability	.811
Drive to Achieve	.580
Mathematical Ability	.678
Self-Confidence (Intellectual)	.751
Social Self Concept	
Leadership Ability	.789
Popularity	.770
Public Speaking Ability	.777
Self-Confidence (Social)	.798
Pluralistic Orientation	
Ability to See The World From Someone Else's Perspective	.738
Tolerance of Others With Different Beliefs	.776
Openness to Having My Own Views Challenged	.743
Ability to Discuss and Negotiate Controversial Issues	.713
Ability to Work Cooperatively With Diverse People	.743
Habits of Mind	
Ask Questions in Class	.507
Support Your Opinions With a Logical Argument	.585
Seek Solutions to Problems and Explain Them to Others	.637
Revise Your Papers to Improve Your Writing	.507
Evaluate the Quality or Reliability of Information You Received	.610
Take a Risk Because You Feel You Have More to Gain	.532
Seek Alternative Solutions To a Problem	.641
Look Up Scientific Research Articles And Resources	.512
Explore Topics on Your Own, Even Though Not Required	.569
Accept Mistakes as Part of The Learning Process	.437
Seek Feedback on Your Academic Work	.545
Likelihood of College Involvement	
Socialize With Someone of Another Racial/Ethnic Group	.554



Table C16 continued

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Participate in A Study Abroad Program	.553
Participate in Volunteer or Community Service Work	.723
Participate in Student Government	.577
Participate in Student Clubs/Groups	.798

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## APPENDIX D: BIVARIATE CORRELATIONS

Table D1: Bivariate Correlations

	Four Year Grad	Latino	African American	Race Other	Male	Parental Pell AGI Eligible	High School Grade	SAT	Grants and Sch. Total	Loan Total	Academic Self Concept	Social Self Concept	Pluralistic Orien.	Habits of Mind	Likeli. of College Involv.
Four Year Grad	-- .086**	-.067**	.115**	-.122**	.154**	-.130**	.092**	.170**	-.097**	-.034	.065**	.039*	-0.007	0.019	.088**
Latino	--	-.122**	.850**	0.003	-.275**	.312**	-.054**	-.365**	.286**	.051**	-.088**	0.006	0.013	-0.033	0.016
African American	--	-.419**	-.094**	-.145**	.130**	-.114**	-.230**	.137**	.086**	0	.090**	0.021	-0.007	.056**	
Race Other	--	.047*	.328**	-.354**	.110**	.456**	-.334**	-.092**	.080**	-.053**	-0.024	0.034	-0.044*		
Male	--	0.028	-0.023	0.012	.171**	0.004	-0.023	.171**	.136**	.053**	-0.033	.062**	0.001		
Parental AGI	--	-.766**	.097**	.424**	-.715**	-0.006	-.103**	-.081**	-.103**	-0.016	0.011	-.044*	-0.001		
Pell Eligible	--	-.098**	-.402**	.207**	-0.022	-0.005	.294**	.044*	.302**	-.061**	.042*	.095**	0.03		
High School Grade	--	-.242**	-.112**	-.085**	-0.034	-0.012	0.034	0.01	.054**						
SAT	--	-.085**	--	0.007	0.013	0.028	0.004	0.014							
Grants and Sch. Loan Total	--	.443**	--	.290**	.330**	.062**									
Academic Self Concept	--	.313**	.337**	--	.409**	.258**									
Social Self Concept	--	--	--	--	--	--									
Pluralistic Orien.	--	--	--	--	--	--									
Habits of Mind	--	--	--	--	--	--									
Likeli. of College Involv.	--	--	--	--	--	--									

Note: Correlations marked with \*\* are significant at the 0.01 level, those marked with \* are at 0.05 level.

## APPENDIX E: REGRESSION RESULTS

Table E1: Iteration History

Block Iteration	-2 Log Likelihood		Constant	Gender	Latino	AA	AGI	GPA	SAT	Loan	G/S	Pell	ASCF	SSCF	LOCF	PO	HF	
	1	2																
0	1	3569.336	0.14															
	2	3569.336	0.15															
1	1	3449.636	1.09	-0.53	-0.29	-0.59	0.20											
	2	3449.466	1.13	-0.56	-0.31	-0.61	0.20											
	3	3449.466	1.13	-0.56	-0.31	-0.61	0.20											
2	1	3402.367	-2.23	-0.61	-0.07	-0.29	0.13	0.14	0.00									
	2	3401.818	-2.39	-0.65	-0.07	-0.31	0.13	0.15	0.00									
	3	3401.818	-2.39	-0.65	-0.07	-0.31	0.13	0.15	0.00									
	4	3401.818	-2.39	-0.65	-0.07	-0.31	0.13	0.15	0.00									
3	1	3401.32	-2.04	-0.61	-0.08	-0.29	0.13	0.14	0.00	0.00	0.00	0.00	-0.09					
	2	3400.764	-2.20	-0.65	-0.08	-0.31	0.14	0.15	0.00	0.00	0.00	0.00	-0.09					
	3	3400.764	-2.20	-0.65	-0.08	-0.31	0.14	0.15	0.00	0.00	0.00	0.00	-0.09					
	4	3400.764	-2.20	-0.65	-0.08	-0.31	0.14	0.15	0.00	0.00	0.00	0.00	-0.09					
4	1	3388.01	-1.93	-0.57	-0.09	-0.35	0.12	0.13	0.00	0.00	0.00	0.00	0.08	0.02	0.10	0.10	-0.05	-0.05
	2	3387.34	-2.09	-0.61	-0.09	-0.37	0.13	0.14	0.00	0.00	0.00	0.00	0.08	0.02	0.11	0.11	-0.06	-0.05
	3	3387.34	-2.09	-0.61	-0.09	-0.37	0.13	0.14	0.00	0.00	0.00	0.00	0.08	0.02	0.11	0.11	-0.06	-0.05
	4	3387.34	-2.09	-0.61	-0.09	-0.37	0.13	0.14	0.00	0.00	0.00	0.00	0.08	0.02	0.11	0.11	-0.06	-0.05

Table E2: Classification Table

Block	Observed Four-Year Grad	Predicted Not Grad	Predicted Grad	% Correct
<u>Zero</u>	No	0	1199	0
	Yes	0	1386	100
	Overall % Correct			53.6
<u>One</u>	No	484	715	40.3
	Yes	328	1058	76.4
	Overall % Correct			59.6
<u>Two</u>	No	546	653	45.5
	Yes	383	1003	72.4
	Overall % Correct			59.9
<u>Three</u>	No	558	641	46.5
	Yes	390	995	71.8
	Overall % Correct			60.1
<u>Four</u>	No	569	630	47.4
	Yes	381	1005	72.5
	Overall % Correct			60.9

Table E3: Variables in Equation

Block	Variable	B	S.E.	Wald	df	Sig	Exp(B)	95% CI Lower	95% CI Upper
<u>Zero</u>	Constant	0.145	0.039	13.456	1	0	1.156		
<u>One</u>	Gender	-0.555	0.084	44.108	1	0	0.574	0.487	0.676
	Latino	-0.305	0.106	8.267	1	0.004	0.737	0.598	0.907
	Afr.								
	Ame.	-0.614	0.181	11.482	1	0.001	0.541	0.38	0.772
	AGI	0.202	0.032	40.999	1	0	1.224	1.15	1.302
	Constant	1.133	0.334	11.543	1	0.001	3.105		
<u>Two</u>	Gender	-0.652	0.086	57.254	1	0	0.521	0.44	0.617
	Latino	-0.073	0.114	0.412	1	0.521	0.93	0.744	1.162
	Afr.								
	Ame.	-0.305	0.188	2.626	1	0.105	0.737	0.51	1.066
	AGI	0.134	0.033	16.142	1	0	1.144	1.071	1.221
	GPA	0.149	0.056	7.162	1	0.007	1.16	1.041	1.294
	SAT	0.002	0	33.649	1	0	1.002	1.001	1.002
	Constant	-2.393	0.642	13.911	1	0	0.091		
<u>Three</u>	Gender	-0.653	0.086	57.3	1	0	0.521	0.44	0.617
	Latino	-0.078	0.116	0.453	1	0.501	0.925	0.737	1.161
	Afr.								
	Ame.	-0.307	0.19	2.614	1	0.106	0.735	0.507	1.067
	AGI	0.141	0.05	7.981	1	0.005	1.151	1.044	1.269
	GPA	0.147	0.056	6.923	1	0.009	1.158	1.038	1.292
	SAT	0.002	0	28.697	1	0	1.002	1.001	1.002
	Loan	0	0	0.604	1	0.437	1	1	1
	G/S	0	0	0.405	1	0.525	1	1	1
	Pell	-0.092	0.188	0.242	1	0.622	0.912	0.631	1.317
	Constant	-2.204	0.749	8.672	1	0.003	0.11		
<u>Four</u>	Gender	-0.607	0.091	44.296	1	0	0.545	0.456	0.652
	Latino	-0.091	0.117	0.609	1	0.435	0.913	0.727	1.147
	Afr.								
	Ame.	-0.37	0.192	3.714	1	0.054	0.691	0.474	1.006
	AGI	0.126	0.05	6.245	1	0.012	1.134	1.027	1.251
	GPA	0.137	0.058	5.502	1	0.019	1.146	1.023	1.285
	SAT	0.002	0	26.783	1	0	1.002	1.001	1.002
	Loan	0	0	0.597	1	0.44	1	1	1

Table E3 continued

G/S	0	0	0.187	1	0.665	1	1	1
Pell	-0.084	0.188	0.2	1	0.655	0.919	0.635	1.33
ASCF	0.023	0.053	0.185	1	0.667	1.023	0.922	1.134
SSCF	0.107	0.049	4.742	1	0.029	1.113	1.011	1.226
LOCF	0.105	0.045	5.434	1	0.02	1.111	1.017	1.214
PO	-0.056	0.047	1.39	1	0.238	0.946	0.862	1.038
HF	-0.05	0.047	1.091	1	0.296	0.952	0.867	1.044
Constant	-2.087	0.802	6.783	1	0.009	0.124		

Table E4: Omnibus Tests of Model Coefficients

Model	Chi-square	df	Sig.
Block 1	119.87	4	0
Block 2	167.518	6	0
Block 3	168.572	9	0
Block 4	181.996	14	0

Table E5: Model Summary

Model	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Block 1	3449.466	0.045	0.061
Block 2	3401.818	0.063	0.084
Block 3	3400.764	0.063	0.084
Block 4	3387.34	0.068	0.091

Table E6: Hosmer and Lemeshow Test

Model	Chi-square	df	Sig.
Block 1	11.604	6	0.071
Block 2	4.844	8	0.774
Block 3	3.363	8	0.91
Block 4	3.802	8	0.875

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