UNDERSTANDING THE IMPACT OF ACADEMIC ENTRY CHARACTERSTICS,

REMEDIATION REQUIREMENTS, AND SEMESTER COURSE HOUR LOAD IN

THE FIRST YEAR ON ACADEMIC PERFORMANCE AND PERSISTENCE TO

GRADUATION FOR LATINO STUDENTS

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

by

Brenda Joy Rhoden

August 2015

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August 2015

For Coby, Colten, & Callan

In loving memory of Phillip George Johnson (1931-2015)

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Abstract

College access and student success, defined as timely college graduation, remains a key goal for many Texas policymakers (Braxton, Doyle, Hartley, Hirschy, Jones, & McLendon, 2014; Closing the Gaps, 2013). Texas ranks second only to California to its population of Latinos (Vega & Martinez, 2012); how Latinos persist to college graduation in Texas is representative of the Latino undergraduate experience nationwide, including potential issues and challenges. Further, how institutions of higher education address Latino student needs and assist in paving their pathway through college helps establish best practices for the entire nation. As institutions of higher education remain one of the primary vehicles for overcoming social and economic inequalities in the United States (Carey, 2004; Vega & Martinez, 2012), high quality experiences and educational accessibility (as well as affordability) at public universities is essential for Latinos to achieve economic growth and social mobility.

The purpose of this study is to advance the understanding of undergraduate Latino student persistence by analyzing a variety of pre-college variables, as well as college attendance behaviors and academic achievement from a research university located in Southeast Texas, which will be known as Central South University. This study will follow the Latino population of the entering class of first-time in college freshmen to Central South University for fall 2003 and track them until summer 2009. Academic entry characteristics, along with remediation requirements, and semester credit hour load

will be utilized to ascertain effect on institutional first-year grade point average (GPA) as well as likelihood of persistence to graduation for Latino students. The following research questions will be addressed:

1.   Among Latino students, how do academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and semester credit hour load impact institutional first-year GPA?

2.   Among Latino students, how do academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and semester credit hour load predict the likelihood of persistence to graduation?

Two regression analyses were conducted in order to identify how the relative contributions of predictor variables (gender, SAT score, high school GPA, high school class rank, college remediation requirements, and semester credit hour load) contribute to academic performance in the first year and student persistence to graduation within 6 years. Specifically, a multiple hierarchical linear regression was utilized to answer the first research question (academic performance measured by institutional grade point average at the conclusion of the first year) and a hierarchical logistic regression was utilized to answer the second research question (persistence measured by graduation from Central South University by summer 2009).

The multiple hierarchical linear regression analysis confirmed that the demographic of gender had no predictive value on academic achievement at the conclusion of the first year, while both high school characteristics (SAT score, high

school rank, and high school GPA) and semester course hour load had moderate predictive value (16.5% and 31.8%, respectively) at a statistically significant level [F (7) = 42.95, p<.001]. The hierarchical logistic regression analysis confirmed that a full model with semester course hour load had a moderate predictive value (16.4-22.5%) with percentage accuracy in classification of 69.2% at a statistically significant level [F (5) = 65.18, p < .001]. This study showed little predictive power for the remediation required variable in either analysis; however, this is understandable since less than 12% of the Latino population was designated for required remediation coursework. Further studies could explore impact of scholarships on persistence to graduation and semester course hour load (enrollment intensity) as well as major choice and federal financial aid eligibility.

KEYWORDS: Latino students, Persistence, Retention, Student success.

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Chapter I

Introduction

The first year of college is often a period of transition, adjustment, and new experiences for first-time college students, sometimes resulting in poor retention rates for freshmen (Levine & Cureton, 1998; Schreiner, Noel, Anderson, & Cantwell, 2011; Upcraft & Garder, 1989). While overall enrollment and retention rates are consistently on the lists of concerns for college and university administrators in higher education (Bean, 1990), the largest proportion of students leaving college at four-year public institutions do so during their freshman year and 40 percent of all students who begin college in the United States will ultimately not earn a degree (Adelman, 2006; Tinto, 1993, 1997). Further, approximately half of the first-year students who depart from their initial institution of choice decide to do so in the first ten weeks of their first semester on campus (Blanc, DeBuhr, & Martin, 1983; Tinto, 1997). Among college students, a collection of stressors is frequently experienced during the first year, including academic issues (Pascarella & Terenzini, 2005), financial burdens (Skowron, Wester, & Azen, 2004), and social tension (Hossler, Schmit, & Vesper, 1999).

A key issue is that the number of students graduating from Texas high schools has increased by 50 percent from 1994 to 2004, yet the number of college-age students enrolling in Texas public postsecondary institutions has not mirrored this growth and has only risen 27 percent (Harris & Tienda, 2010; Tienda, 2006; Zurita, 2005). Even so, by 2015, the number of college students in Texas is projected to reach 1.65 million. It is

estimated that the number of Latino[1] students (676,100; 40.9%) enrolled in Texas

colleges will surpass the number of White[2] students (671,300; 40.7%) for the first time in

history (Closing the Gaps, 2008; College Board, 2010). Though the percentage of Latino

students at institutions of higher education has steadily increased over the past two

decades, the proportion of Latino students graduating from college has not. Latino high

school graduates are matriculating into college at higher rates than other minority

populations but are graduating at lower rates than their peers (Arbona & Nora, 2007). In

2000, the percentage of 25-to-29-year-old Latinos with at least a bachelor's degree was

only 10 percent, whereas African Americans was 18 percent and Whites was 34 percent

(Llagas & Snyder, 2003). The continuous growth of the Latino college-attending

population challenges higher education personnel to be increasingly aware of the issues

that affect persistence of this diverse student group (Hernandez & Lopez, 2005).

Persisting and graduating in a timely manner are not only important benchmarks

to university administrators, students, and their families (Joo, Durband, & Grable, 2008),

but also to stakeholders such as state and federal policymakers as well as taxpayers who

help underwrite public higher education across the United States (Berger & Lyon, 2005).

Unfortunately, college tuition and fees have risen at rates faster than both inflation and

the median family income since 1978 (College Board, 2009), creating a larger financial

gap for many students and their families as well as impacting persistence decisions

(DesJardins, Ahlburg, & McCall, 2002; Herzog, 2005; St. John, Paulsen, & Carter,

2005). Higher education researchers report growing concern for the future of higher

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[1] Hispanic and Latino status is mutually exclusive of racial categories (Castellanos & Jones, 2003; Trevino, 1986). The terms *Hispanic* and *Latino/a* will be used interchangeably throughout this dissertation.
[2] The term *White* refers to non-Hispanic Whites (Fry, 2002).

education as access to postsecondary institutions, especially for minorities and disadvantaged populations, has become increasingly difficult due to relevant pre-college factors (such as high school experiences, encouragement/support from family/friends, high school academic performance, institutional commitment, and psychosocial factors), rising tuition, limited knowledge about post-high school opportunities, and lack of academic preparedness (Nora, 2001; Otero, Rivas, & Rivera, 2007; Pascarella & Terenzini, 1998).

In 2003, approximately 2.7 million students graduated from high school in the United States and nearly 64 percent (1.7 million) proceeded into an institution of higher education that fall (U.S. Department of Labor, 2004). However, with only about one-third of the college-enrolling population considered academically prepared for college-level material (Green & Foster, 2003), many students placed into pre-college level coursework generally labeled as remedial or developmental (Adelman, 2004; Merisotis & Phipps, 2000). Remediation is the one of the more common courses of action for first-year college students who have been accepted at their institution of choice but are deemed academically weaker than their peers; remediation typically includes specified coursework (most notably in mathematics, reading, and/or writing) as well as tutoring and learning services that are designed to compensate for skills not acquired in high school (Martorell & McFarlin, 2011). The actual percentage of traditional first-year undergraduates undertaking at least one remedial course ranges from 20 percent to 40 percent (Adelman, 2004; Attewell, Lavin, Domina, & Levey, 2006); Bettinger and Long (2009) found that colleges required nearly one-third of first-year students to take at least one remedial course in mathematics, reading, or writing due to scores on pre-college

testing. Though academic preparedness and remediation at first appear to be on opposite sides of the educational spectrum, the prevalence of developmental courses at four-year institutions (over 75 percent) indicates that remedial education can be key to student persistence and graduation (Attewell et al., 2006; Bettinger & Long, 2009; Merisotis & Phipps, 2000).

As early as the mid-1990s, policymakers in Texas and throughout the nation sharpened the focus on student retention and persistence in both K-12 and higher education as well as the pipeline between (Wright, 1996). During this time period, Texas legislators encouraged Texas institutions of higher education to increase the number of graduates, shorten the time-to-degree, and provide additional funding and incentives for students who persisted to graduation in a timely manner (Wright, 1996). In response, the 78th and 79th Texas Legislatures passed legislation that created the Texas Success Initiative (Texas Education Code, §51.3062), the Texas B-On-Time Loan Program (Texas Higher Education Coordinating Board, 2007; Texas Legislative Budget Board, 2007), the Enrollment Cap and Tuition Premiums (Texas Education Code, §54.014) in addition to developing the Advancement of College Readiness in Curriculum (Texas Education Code, §28.008). Though explicit mandates are not yet in place limiting the time for a student to graduate from college, the message is clear from Texas policymakers that high school graduates should be prepared for college and that they should proceed to graduation within four to six years (Kever, 2010).

The National Center for Education Statistics (NCES) reports that the number of students graduating with a baccalaureate degree in four years has fluctuated from 45.4 percent in 1977 to 31.1 percent in 1990 to 36.4 percent in 2006 (NCES, 1995, 2011).

Though the average undergraduate degree program in Texas is 120 semester credit hours (Texas Education Code, §61.0515; Texas Higher Education Coordinating Board, 2008), data indicate that only 23 percent of students complete their degree in four years with a median of 130 attempted hours (Texas Higher Education Coordinating Board, 2005). An additional 23 percent (46 percent total) complete their undergraduate degree in five years with a median of 147 attempted hours and 6.6 percent (52.6 percent total) complete their degree in six years with a median of 166 attempted hours (Texas Higher Education Coordinating Board, 2005). In order for students to graduate from an institution of higher education in a timely manner, it is imperative that students enroll in and complete at least a full-time credit hour load each semester, with full-time status defined as 12 semester credit hours (Creusere, Fletcher, Neal, & Shook, 2011).

The U.S. Department of Education determined that part-time enrollment in college is a significant risk factor for undergraduate persistence to graduation (Fry, 2002). Though the U.S. Department of Labor reported that 90 percent of 2003 high school graduates enrolled full-time in college that same year, only 74 percent of Latino students enrolled full-time (2004), with many at community colleges instead of four-year institutions (Fry, 2002, 2004); Fry (2002) found that traditional, first-time in college Latino students as a group are the least likely to be enrolled as full-time college students. However, studies have found that students who begin college enrolled full-time and maintain continuous enrollment from fall to spring semesters are significantly more successful in persisting to graduation, even if they sometimes fall to part-time enrollment, as compared to full-time students who stop-out or drop-out in the course of their academic career (Chan, 2002; Stratton, O'Toole, & Wetzel, 2007, 2008).

Purpose of the Study

The purpose of this study is to advance the understanding of student persistence and academic achievement for first time in college (FTIC) Latino students at a four-year institution by examining student enrollment behaviors and outcomes through regression modeling on both the grade point average (GPA) and persistence to graduation of the 2003 incoming cohort at a large urban, public institution in the South region of the United States, which will be known as Central South University (CSU). The study will focus on determining which variables affect individual Latino student persistence. Based on information that has been collected for this cohort, the study will help examine how variables such as gender, ethnicity, high school rank, high school grade point average (GPA), SAT, mathematics remediation required, reading remediation required, writing remediation required, college semester GPA, college cumulative GPA, semester credit hours, and academic major might affect a student's persistence to graduation. Specifically, this study seeks to answer the following questions:

Research Questions

1. Among Latino students, how do academic entry characteristics such as SAT/ACT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and semester credit hour load impact institutional first-year GPA?

2. Among Latino students, how do academic entry characteristics such as SAT/ACT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and first-year semester credit hour load predict the likelihood of persistence to graduation?

Theoretical Framework

The theoretical framework of this study will be based on seminal student retention and persistence research, including Spady's model of student departure (1970), Tinto's student integration theory (1975, 1987, 1993, 1997), Bean's model of student attrition (1980, 1985, 1990), and Cabrera, Nora, and Castaneda's Integrated Model of Student Retention (1992). Utilizing this framework, regression models will be developed to determine if there are differences in institutional first-year grade point average and the likelihood to persist to graduation for Latino students.

Limitations of Study

There are several limitations to this study that may affect the results. First, the reliance on secondary data limit the number of questions that can be answered as well as the particular population studied. Second, restricted access to the dataset limits the type of analysis that can be employed. Third, the results of this study are only applicable to the public institution where the data were collected. However, despite these limitations, valuable data will be gathered to help the institution determine where there might be systemic pipeline leaks and which variables encourage persistence at the institution. These findings were discussed in chapter four.

Definition of Key Terms

Defining the relevant terminology used in this study is essential for reader clarity. The following terms will be defined in this section: drop-out, first-time in college, grade point average (GPA), persister, persistence rate, remediation, and stop-out.

Drop-out. Drop-out refers to a student whose initial educational goal is to complete a bachelor's degree but who ceases academic enrollment from the institution

during the six-year period of study and does not re-enroll in courses during the period of the study (Berger & Lyon, 2005; Stratton, O'Toole, & Wetzel, 2008; Tinto, 1993, 1997).

First-time in college. First-time in college (FTIC) refers to students who are entering college for the first time in the fall semester immediately following graduation from high school (Pascarella & Terenzini, 2005; Tinto, 1993). For the purposes of this study, FTICs will be students who graduated from high school in 2003 and started college in fall 2003.

Grade point average. Grade point average (GPA) refers to a student's academic achievement in college on a 4.0 grade point scale. GPA is calculated each semester by multiplying the grade received in each course by the number of credit hours and then dividing that number by the total number of semester credit hours. See Table 1 for the grade point scale that is utilized by Central South University.

Table 1

Grade Point Scale

Letter Grade	Grade Points
A	4.00
A-	3.67
B+	3.33
B	3.00
B-	2.67
C+	2.33
C	2.00
C-	1.67
D+	1.33
D	1.00
D-	0.67
F	0.00

Grades of S, U, and W are not assigned grade point values and are not utilized in the

calculation of GPA. The cumulative GPA is determined by using the same calculation

for all semesters enrolled, including repeated courses (Central South University,

Academic Catalog). For the purposes of this study, the first-year GPA will be the

cumulative GPA at the end of the spring 2004 semester.

Persister. Persister refers to a student who sustains enrollment at the institution

of higher education during the six-year period of study (Berger & Lyon, 2005; Porter,

1989). For the purposes of this study, persisters will be defined as students who maintain

continuous enrollment in fall and spring semesters.

Persistence rate. Persistence rate refers to the percentage of students that

continue enrollment at the institution divided by the number of students that matriculated

together as first time in college (FTIC) students (Pascarella & Terenzini, 2005; Tinto,

1997). For the purposes of this study, the incoming 2003 cohort will provide the base number of matriculated students.

Remediation. Remediation refers to whether it was mandatory for a student to complete remedial coursework during their first academic year (fall 2003 and spring 2004) prior to proceeding to degree plan coursework based on pre-college testing (Adelman, 2004; Bettinger & Long, 2009; Cohen & Brawer, 2008; Merisotis & Phipps, 2000). Remediation for the purposes of this study includes three subjects: mathematics, reading, and writing.

Stop-out. Stop-out refers to a student that temporarily ceases academic enrollment for a specified period of time. For the purposes of this study, long-term stop-out refers to a student that is not enrolled for more than one academic year, but returns to school within the study period (fall 2003 through summer 2009); short-term stop-out refers to a student that temporarily ceases enrollment and returns within one academic year (Pascarella and Terenzini, 2005; Stratton, O'Toole, & Wetzel, 2008; Tinto, 1997).

Significance of Study

The design and analysis of this study has the potential for the gathering valuable data that can assist the institution of higher education in uncovering significant and consistent retention issues within the Latino undergraduate student life cycle. Determination of persistence predictors at an individual institution can be generalized to similar institutions with like undergraduate populations. In analyzing individual student data that includes pre-college and college information, this study has the opportunity to further add to the robust literature about the Latino undergraduate student at four-year institutions and diversity within the university community, helping illuminate how

specific variables might be significant predictors for undergraduate Latino student success. Finally, this study will assist in providing both breadth and depth to the individual institution that is being studied, providing campus-level understanding and context concerning how the Latino undergraduate student persists and succeeds.

Organization of Study

Chapter I includes the introduction, purpose of the study, research questions, theoretical framework, limitations of the study, definition of key terms, significance of the study, and organization of the study. Chapter II includes the review of literature related to student persistence both during the first year and to graduation for Latino undergraduates in the state of Texas. Chapter III describes the methodology to be used in the study, including the null hypotheses, setting, participants, data, variables, and data analysis procedures.

Chapter II

Review of Literature and Theoretical Framework

Introduction

Throughout the 20th century, researchers have been interested in college student retention and have studied numerous constituencies in attempts to track variables that affected students and impacted institutions (Astin, 1975, 1977, 1985; Astin & Oseguera, 2005; Bean, 1980, 1983, 1990; Berger, 2000; Berger, Blanco Ramirez, & Lyon, 2012; Braxton, 2000; Braxton, Hirschy, & McClendon, 2004; Cabrera, Nora, & Castaneda, 1992; Feldman & Newcomb, 1969; Seidman, 2005, 2012; Tinto, 1975, 1993, 1997, 1998, 2005, 2012; Spady, 1970). One of the influential researchers in student retention, Vincent Tinto, built upon the early research and published his interactionalist theory of college student departure in 1975. Soon after, in 1980, John Bean began publishing his research and developing his student attrition model, which initially focused on traditional student cohorts but eventually expanded to nontraditional and part-time cohorts (1990). Though more contemporary than both Tinto's and Bean's models, Cabrera, Nora, and Castaneda's (1992) student adjustment model is based in part on both previous models, positing that persistence is based on interactions between the student and variables such as pre-college factors, personal experiences, academic integration, financial aid, institutional fit, peer integration, and family support, as well as interactions with university faculty and staff. The emergence of the theory base of retention in the 1970s, 1980s, and 1990s resulted not only in numerous studies that explored retention at singular institutions, but retention across different types and sizes of institutions as well as with a variety of student types (Berger & Lyon, 2005).

The individualized nature of student departure inherently creates a dearth of answers about causality due to the inability to follow-up with each and every student that leaves an institution (Astin, 1984; Bean, 1990; Iffert, 1956; Pascarella & Terenzini, 2005; Raimst, 1981; Spady 1970; Summerskill, 1962; Tinto, 1975). More frustrating, many times it is unknown whether the departure is a temporary (stop-out) or permanent (drop-out) departure from higher education (Pascarella & Terenzini, 2005). Students leave college for a variety of reasons, including individual and institutional specific-reasons, such as poor grades, change of major, lack of money, pressing family demands and commitments, poor institutional fit, dissatisfaction with the institution, lack of support and/or poor preparation for college, among others (Astin, 1975; Bean, 1980; Berger & Braxton, 1998; Braxton, 2000; Jensen, 1981; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Pascarella & Terenzini, 2006; Tinto, 1975; Titus, 2006). In 1995, 82% of institutions of higher education reported attempts to address student retention programmatically (Gardner, 2001). Many institutions across the United States have chosen to adopt the philosophy of the "First-Year Experience," which seeks to address some of the structural problems inherent in the organization of the first year of college, including a negative impact on student learning, success, satisfaction, and retention (Gardner, 2001). In order to combat departure during the first year, many institutions invest resources in both faculty and academic advisors to work directly with incoming students to encourage a smooth transition to college (Upgraft & Gardner, 1989). This chapter will review pertinent models of student persistence and retention, student access and success, and demographic trends as well as both the Texas legislative and college financing context.

Models of Student Persistence and Retention

The field of student persistence and retention has expanded dramatically over the past sixty years (Seidman, 2005). Though there were some initial studies done between the 1920s and 1940s, it was not until the post-World War II boom of higher education in America that student retention was truly researched and documented. Even so, it was a gradual transition from the 1940s until the 1970s of widening the focus from student attrition to student retention that helped in establishing retention as an important field in higher education studies (Beal & Noel, 1980). Not until the 1990s did the spotlight shift from student retention (how colleges could retain students) to student persistence (what motivated students to persist to graduation) (Seidman, 2005).

Whereas research initially began on why students leave college (Tinto, 1993), the field is currently most concerned with what colleges and institutions of higher education can do to encourage persistence even if graduation does not occur at their institution (Pascarella & Terenzini, 2005). Rather than merely studying fixed variables, such as socio-economic status, family size, high school grade point average, intelligence quotient, ethnicity, and gender, researchers began to expand their attention to variables that colleges can affect, such as orientation programs, summer bridge programs, counseling, admissions, and financial aid (Beal & Noel, 1980). This change in focus has allowed researchers to uncover a variety of reasons why students may or may not persist to graduation, such as the importance of social integration and support systems, financial aid and the ability to pay for higher education, and the effects of student and faculty interactions (Seidman, 2005).

Student persistence in the first year. Student persistence can be defined as "the desire and action of a student to stay within the system of higher education from beginning year through degree completion" (Berger & Lyon, 2005, p. 7). Many colleges and universities are faced with the difficulties not only retaining students to graduation, but from their freshman to sophomore year (Thompson, Orr, Thompson, & Grover, 2007). Tinto found that nearly 57% of all college dropouts from four-year institutions leave prior to the start of their second year and that nearly 40% of students who begin college in the United States will not earn their undergraduate degree (1997). Despite increases in enrollment since the 1970s (Thompson et al., 2007), research has shown that the freshman to sophomore dropout rates have remained relatively constant with approximately 30% of full-time freshmen not returning to the same institution their sophomore year (Upcraft & Gardner, 1989).

Many institutions across the United States have chosen to adopt the philosophy of the "First-Year Experience," which seeks to address some of the structural problems inherent in the organization of the first year of college, including a negative impact on student learning, success, satisfaction, and retention (Gardner, 2001). In order to combat departure during the first year, many institutions have invested increased resources in faculty and academic advisors to work directly with incoming students to assist in the college transition process (Upcraft & Gardner, 1989). Further, research has found that students' institutional commitment, combined with their financial aid package, can encourage persistence to the goal of completing an undergraduate degree (Gross, Hossler, & Ziskin, 2007).

Spady's model of student departure. Spady's (1970) study of Emile

Durkheim's (1897/1951) theory of suicide was a catalyst in his development of the model

of the student dropout process as Durkheim proposed that suicide is the result of an

individual dropping out of their social network due to lack of integration in society.

Durkheim argued that the likelihood of suicide increases when individual values are not

aligned with that of their peers (or social group) or that they otherwise lack support from

this structure (Bean & Eaton, 2002); Spady likened dropping out of college to suicide, as

the student/individual was withdrawing from their social system due to the lack of value

congruence or social support (Andres & Carpenter, 1997). Spady (1975) indicated that

integration was key in determining whether a student persisted or withdrew and that a

person's family background often provided the main sphere of influence in how and to

what level a student was able to integrate; full integration indicates that a student is able

to meet the demands of both the social and academic systems within higher education

(see Figure 1).
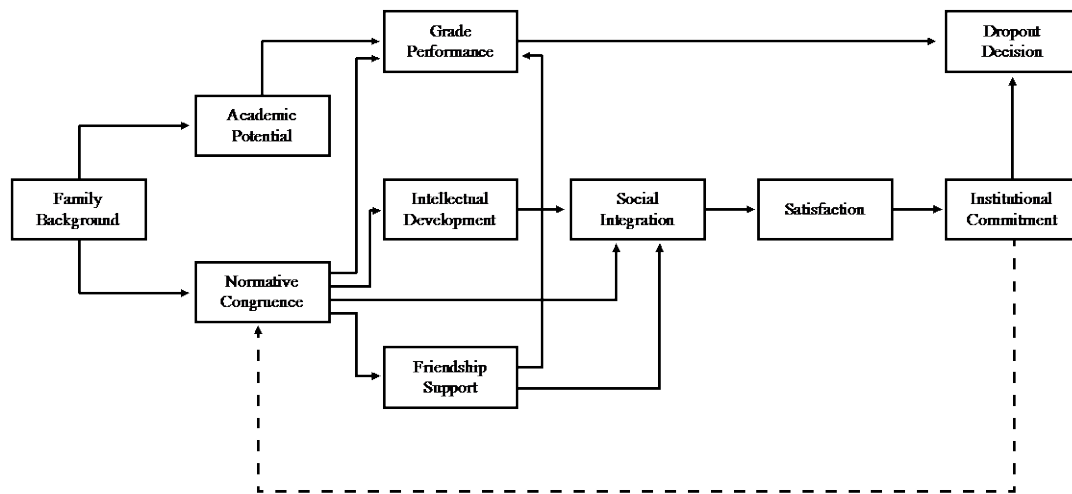
Figure 1. Spady's Model of Student Departure. Adapted from Spady (1970).

Tinto's model of student integration. Vincent Tinto's student integration theory

(1975, 1987, 1993, 1997) is the most consistently tested model of student persistence

(Cabrera, Nora, & Castaneda, 1992). Tinto's model expanded on Spady's research by

reinterpreting value congruence for academic integration and social support for social

integration, while applying social exchange theory (Blau, 1964) to Durkheim's theory of

suicide. Social exchange theory is based on the premise that individuals make decisions

by weighing social costs and rewards, ultimately avoiding more costly behaviors in favor

of seeking rewards via relationships, interactions, and emotional states (Nye, 1979).

Within the framework of higher education, Tinto (1975, 1987) proposed that students

individually applied social exchange theory in order to determine whether the perceived

benefits (rewards) of college are higher than the costs—if so, then the student remains in school; if other activities/commitments (family, work, social group) are perceived as more important (rewarding) than the costs of attending college, then a student will choose to drop out.

Tinto's model of student retention is based on the belief that students enter college with numerous individual characteristics that impact the decision to leave college, including socioeconomic status, parental education level, family expectations, academic ability, race, gender, and high school achievement (1975). Tinto's theory asserts that persistence is a longitudinal set of interactions between the student and the academic and social components of the institution. These components affect the student's commitment to the institution and commitment to the goal of college completion. Tinto's model indicates that the likelihood that a student will persist to graduation is directly and positively related to the commitment to the institution and/or the goal commitment. Tinto (1987) continued to develop and test his model, integrating Arnold van Gennep's (1909) concept of successful rites of passage as an explanation for student retention in higher education (Bean & Eaton, 2002). Students who choose to leave college often do so because they fail to separate from a previous social group (that does not support their academic goals), poorly transition to college, or fail to incorporate new values and integrate new experiences into their goals of successfully completing college (see Figure 2). In 1993, when Tinto revisited his student integration model, he highlighted the importance of student/faculty relationships as measured by interactions with faculty members and faculty concern for student development as well as the importance of

student finances and the ability to pay as key factors in whether a student is able to successfully transition to college.

| Pre-entry Attributes | Goals/ Commitments | Institutional Experiences | Integration | Goals/ Commitments | Outcome |

Academic System

Formal

Academic Performance

Family Background

Intentions

Faculty/Staff Interactions

Academic Integration

Intentions

Informal

Skills and Abilities

Goal and Institutional Commitments

Goal and Institutional Commitment

Departure Decision

Formal

Prior Schooling

External Commitments

Extracurricular Activities

Social Integration

External Commitments

Peer Group Interactions

Informal

Social System

External Community

Time (T)

Figure 2. Tinto's Student Integration Model. Adapted from Tinto (1994).

Bean's model of student attrition. Bean's student attrition model (1980, 1985, 1990) has provided a complementary response to Tinto's student integration theory (1975). Though consistent with Tinto's theory in many ways (Kelly, Kendrick, Newgent, & Lucas, 2007), Bean's theory highlights the importance of socialization in helping prevent dropouts and found that social engagement in college had a significant effect on institutional fit (1980). Also notable is that Bean's theory is based in organizational behavior models and likens college student departure to employee turnover in companies (Bean, 1980, 1985, 1990). Similar to Tinto (1975), Bean (1985) believes that a student's

individual characteristics influence the transition to college and that the decision to withdraw from an institution is based on a complex set of interactions over time as well as commitment from both the individual and the institution (Cabrera et al., 1992). In Bean's (1985) model, factors affecting dropout include a variety of academic variables (including study hours, study skills, academic advising, absenteeism, major/job certainty, and course availability), social integration variables (including school friends, faculty contact, and student organization memberships), and environmental variables (including finances, work/family responsibilities, opportunity to transfer, and outside encouragement) that are shown to influence a student's decision concerning persisting or dropping out (see Figure 3).
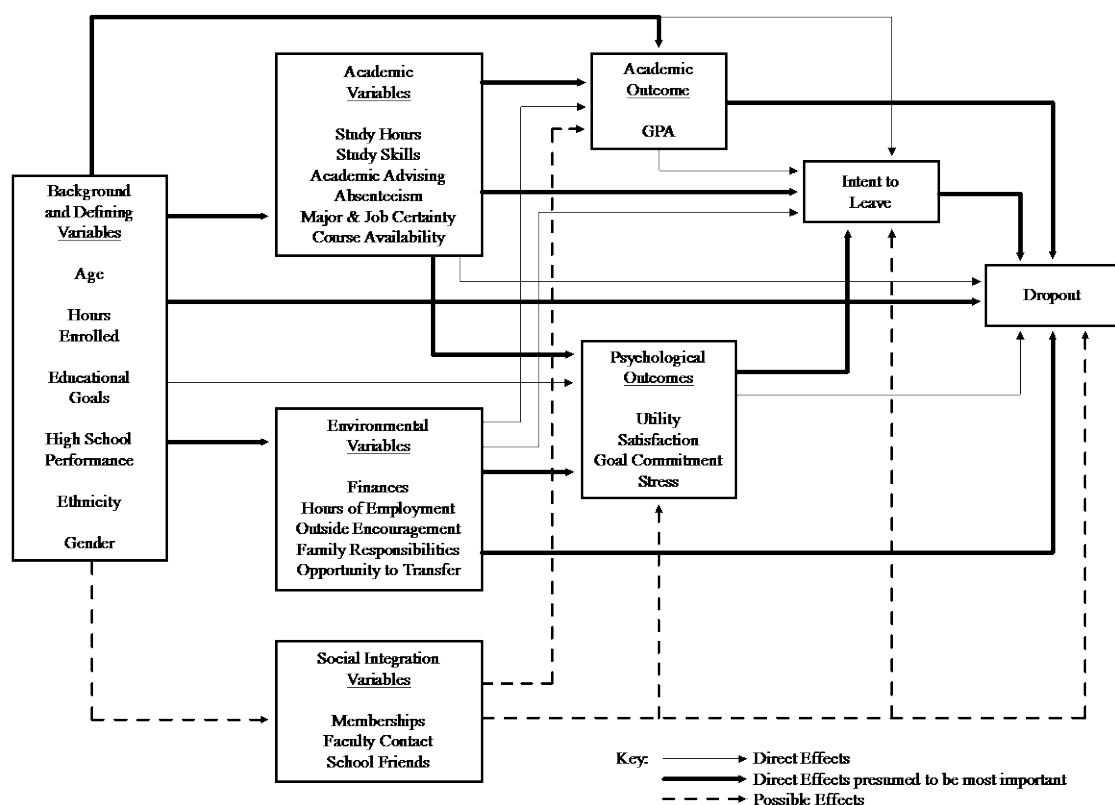

Figure 3. Bean's Model of Student Attrition. Adapted from Bean (1980).

Cabrera, Nora, & Castaneda's integrated model of student retention. In 1992, Cabrera, Nora, and Castaneda developed the integrated model of student persistence consisting of persistence theory, economic theory, and research on financial aid, student influencers (friends, parents, family), and urban institutions of higher education. This integrated model of student retention (Cabrera, et al., 1992) was built upon Tinto's (1975, 1987) student integration model, Bean's (1980, 1982, 1985) student attrition model, the ability to pay model (Cabrera, Stampen, & Hansen, 1990) as well as models concerning the role of friends and familial influence on persistence (Nora, 1987) and financial aid research (Nora, 1990; Voorhees, 1985). Cabrera et al. (1992) theorized that finances impacted students in two ways for persistence purposes, both as a method in increasing persistence to graduation due to their role in lessening financial hardship of the physical costs of college and as a way of facilitating the social and academic integration of the student on campus. The receipt of financial aid was found to be a more reliable indicator of the ability to pay for college rather than a student's socioeconomic status; Cabrera et al. (1992) found a complex set of linkages between financial aid and the following variables that ultimately led to a persistence decision: pre-college academic performance, social integration, GPA, academic and intellectual development, institutional commitment, goal commitment, and intent to persist (see Figure 4).
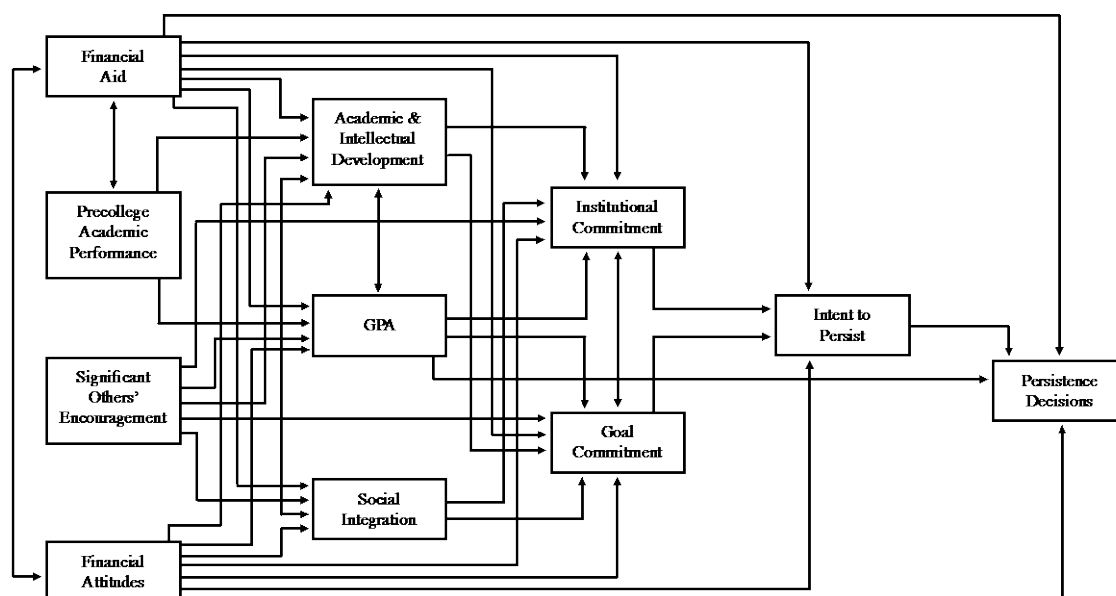
Figure 4. Cabrera, Nora, & Castaneda's Integrated Model of Student Retention.
Adapted from Cabrera, Nora, and Castaneda (1992).

Latino student persistence. Consistently in each of these four models, pre-college factors and academic performance either directly or indirectly impact collegiate student success (measured as GPA), which then leads to individual student persistence decisions; however, none of these models were designed specifically for the Latino student. This study seeks to analyze the data through the lens of the Latino student by critically assessing the following variables as they relate to academic achievement and persistence to graduation:

SAT/ACT score. Perry (2003) reports that minority students score lower on every test from the SAT to the ACT to the Stanford Nine, yet colleges and universities consistently continue to use both the SAT and ACT as admissions criteria.

High school performance (grade point average and class rank). Researchers consistently find that student high school performance, as measured by grade point average and class rank, is one of the best predictors of collegiate success (Astin & Oseguera, 2005; Tinto, 2003). Ruban and Nora (2002) found that the higher the student's class rank, the more likely that they would academically achieve in college; however, the National Task Force on Minority High Achievement (1999) found that Latinos were disproportionately underrepresented when GPA and class rank were used to determine to academic achievers in high school.

College remediation. Braxton et al (2014) found that very few remedial students are able to complete educational objectives; Adelman (1999, 2006) determined that students who enroll in remedial courses are much less likely to persist to graduation that their counterparts who did not enroll in remedial courses. However, Bettinger and Long (2009) found that remediation actually improves persistence and graduation, especially among marginal students.

Semester credit hour load. In order for students to persist to a timely graduation in the state of Texas, students must be full-time (a minimum of 12 credit hours per semester) in each of the long semesters (fall/spring). However, since a bachelor degree is 120, students taking 12 semester credit hours per long semester will not be on target to graduate within four years. Radford and Horn (2012) found that students who average 29.8 semester credit hours per year (an average of 15 semester credit hours per semester) are more likely to persist to graduation within 6 years and that students who earned between 24 and 29.9 semester credit hours in their first year were more than twice as

likely to persist to graduation than students who earned less than 24 semester credit hours during their first year.

  First-year grade point average. Nora and Cabrera (1996) found that first-year grade point average was three times as critical to college persistence for Latino students as compared to their White counterparts..

  Persistence to graduation. According to the U.S. Census (2009) only 12.6% of Latinos attained a bachelor's degree or higher, compared to 29.3% for Whites, 17.6% for African Americans, and 48.8% for Asian Americans; Latinos are now the largest and least educated ethnic minority in the United States (U.S. Census Bureau, 2009). As the current population ages, the United States is increasingly dependent on both Latinos and other minorities to fill in the ranks of both the workplace and economy (Vega & Martinez, 2012). Latinos only had 3.7% participation rate in higher education relative to their population in 2000; in Texas, the *Closing the Gaps by 2015* goal is increase Latino student enrollments from 212,123 in 2000 to 553,723 in 2015 (THECB, 2008).

Demographic Trends

  Demographic trends in the United States project that by 2050, the United States will be a majority minority nation, with no single race/ethnicity accounting for 50 percent or more of the population (U.S. Census Bureau, 2011). Currently, Whites account for 63 percent of the population, with Latinos at 17 percent, African Americans at 12 percent, and Asians at 5 percent; by 2050, the Latino proportion of the population is estimated to account for more than half of the population growth, increasing to 29 percent, with Whites down to 47 percent, African Americans at a slight increase to 13 percent, and the Asian percentage almost doubling to 9 percent (Census Bureau, 2011; Cerna, Perez, &

Saenz, 2009). Behind the changing demographic for the United States is a combination

of immigration, births, and deaths; however, unlike previous demographic changes in the

United States, which were largely dominated by the influx of European immigrants, the

changes in the 21st century are due to the arrival of Asian and Latino immigrants with

higher percentages of women of childbearing age (Taylor & Cohn, 2012). The majority

of the Latino and Asian population growth is due to births rather than immigration with

higher birth rates than the U.S.-born White population, combined with the aging White

population and lower individual birth rates for White women (U.S. Census Bureau,

2011).

   Latino student education trends. Educational achievement among Latino

students is the poorest of the three major race/ethic groups in the United States,

regardless of grade level (Fry, 2004; Oseguera, Locks, & Vega, 2009; Verdugo, 2006).

In 2004, approximately 120,000 students did not graduate from high school with only 60

percent of African American and Latino students graduating from high school, compared

to over 75 percent of White and Asian students (Swanson, 2006). National data indicate

that when comparing similarly prepared White and Latino students, 81 percent White

students complete a bachelor's degree compared to 57 percent Latino students (Fry,

2004). Nationally, 93 percent of Whites in the 25-to-29-age range complete high school,

compared to only 63 percent of Latinos (NCES, 2002).

   As shown in Figure 5, for every 100 Latino students in elementary school, only 55

graduated from high school (as compared to 46 in 2000), with 36 enrolling in higher

education (as compared to 26 in 2000), and ultimately only 13 graduating with a

baccalaureate degree (compared to 8 in 2000); comparatively, for every 100 White

students in elementary school, 77 graduated from high school (as compared to 84 in 2000), and 27 graduated with a baccalaureate degree (as compared to 26 in 2000) (Bailey & Dynarski, 2011; Bell & Bautsch, 2011; NCES, 2000; Padilla, 2007; U.S. Census Bureau, 2010; Yosso & Solorzano, 2006). This inequality in academic outcomes is alarmingly wide; despite K-12 retention efforts for Latino students, the educational pipeline continues to leak for young Latino students (Oseguera, Locks, & Vega, 2009; Yasso & Solorzano, 2006).
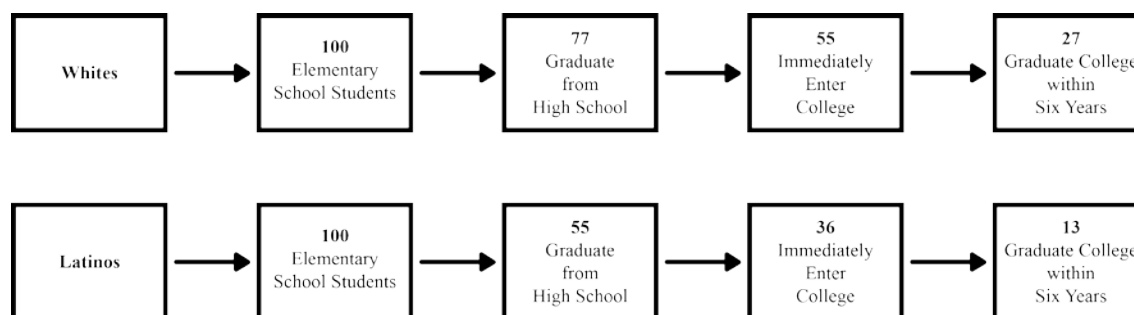
Figure 5. White versus Latino College Completion. Adapted from Bell & Bautsch (2011) and U.S. Census Bureau (2010).

Between 1972 and 2004, the total enrollment rate at degree-granting institutions of higher education for 18-to-24 year olds increased from 25.5 percent to 38.0 percent; however, the rate for Latino students was 13.4 percent in 1972 with an increase to 24.7 percent in 2004 (NCES, 2006; Verdugo, 2006). Furthermore, more than half of the college-attending Latino students were enrolled at two-year institutions, many never to transfer to a four-year institution, much less graduate with a baccalaureate degree (Fry, 2004; Swail, Cabrera, & Lee, 2004).

As the number of Latinos and African Americans continues to increase, the need to ensure that this population is well-educated becomes even more important because of

the economic and social impact on the state of Texas. Generating an educated workforce will result in an incremental gross domestic product of almost $200 billion per year by 2030, an increase in Texas' capacity to develop and draw in new industries, and will enhance the lives for all those who reside in the state (Closing the Gaps, 2000). Moreover, the Latino students that have access to higher education are over-represented in community colleges and are not completing bachelor's degrees at similar rates of African Americans or Whites (O'Connor, Hammack, & Scott, 2010).

Latino Scorecard for Public Institutions in Texas by Vega and Martinez (2012) ranks the Central South University in the bottom 50% out of 30 state institutions in successfully addressing Latino educational needs. Measurements included resources (instructional costs per FTE versus state average instructional cost per FTE), effectiveness (Latino graduation rates as compared to White students), diversity (including Latino faculty versus White faculty and Lation enrollment versus White enrollment), equity (Latino student to Latino faculty versus White student to White faculty), affordability (ratio average tuition to Lation median family income), and access (Latino enrollment at institution versus Latinos aged 18-24 in the service area). The scorecard indicates that the majority of Latino enrollment at institutions of higher education in the state of Texas occur at nine universities in South Texas (which has a higher Latino population relative to the rest of the state) and unfortunately, of the 30 instutions analyzed, only the top 10 (33%) are average or above average in addressing the Latino student criteria used for the scorecard.

Texas Legislative Context

Texas is home to one of the nation's fastest growing and rapidly diversifying populations in the United States (Harris & Tienda, 2010). In the period from 1994-2004 the number of high school diplomas rose by 50 percent, increasing from 163,000 to 244,000 (Tienda, 2006; Tienda & Sullivan, 2009). High school graduation rates, which were 56 percent in 1994, rose almost 11 percentage points to 66.8 percent in 2003 (Swanson, 2006). The number of Latino high school graduates rose 78 percent during this same time period, due to high levels of immigration into Texas and high Latino birthrates in the early 1990s, increasing their share from 29 percent in 1994 to 35 percent in 2004 (Tienda & Sullivan, 2009).

As early as the mid-1990s, policymakers in Texas and throughout the nation began sharpening their focus on student retention and persistence in both higher education and K-12 education as well as the pipeline between (Wright, 1996). Texas legislators began encouraging Texas institutions of higher education to increase the number of graduates, shorten the time-to-completion, and provide funding and incentives for students (Wright, 1996). In response, the 78th and 79th Texas Legislatures passed legislation that created the Texas Success Initiative, the Texas B-On-Time Loan Program, the Enrollment Cap and Tuition Premiums, in addition to developing the Advancement of College Readiness in Curriculum. Though explicit mandates are not yet in place concerning the time it should take for a student to graduate from college, the message is clear from Texas policymakers that not only should high school graduates be prepared for college but that they should also proceed to graduation in a timely manner.

Closing the gaps. In October 2000, the Texas Higher Education Coordinating Board adopted *Closing the Gaps by 2015* as the master plan for higher education in Texas. The goal of the plan is to target and close educational gaps within Texas and between Texas and other states with similar populations. The 2000 U.S. Census Bureau found that a smaller percentage of the Texas population enters higher education than in other large states (and the United States as a whole) with only 9.5% of the Texas population enrolled in higher education in 2010 versus 9.9% for the United States, 11.2% for California, and 10.0% for New York. As part of this plan, there are multiple benchmarks for higher education enrollment numbers and outcome goals to increase the percentage of students who earn a baccalaureate degree within six years at a Texas public institution of higher education, in addition to increasing national competitiveness and research funding (Closing the Gaps by 2015). The four overarching goals of Closing the Gaps by 2015 include the following:

- Goal 1: Close the Gaps in Participation by adding 500,000 additional students (goal was revised to 630,000 in 2006);

- Goal 2: Close the Gaps in Success by increasing number of degrees and certificates by 50% to 163,000 (goal was revised to 210,000 in 2006);

- Goal 3: Close the Gaps in Excellence by increasing the number of nationally recognized programs or services at colleges and universities in Texas;

- Goal 4: Close the Gaps in Research by increasing the level of federal science and engineering research funding to Texas institutions by 50% to $1.3 billion.

In the *Closing the Gaps Progress Report 2012*, the measured progress relative to the target trend line showed that statewide participation (goal 1) was above target, statewide

success (goal 2) was above target, statewide excellence (goal 3) for national rankings was

below target while program recognition was on target, and statewide research (goal 4)

was on target.

      Texas success initiative. The Texas Success Initiative (TSI) is a legislated

program that began in 2003, replacing the Texas Academic Skills Program (TASP) as a

means to improve student achievement and student learning outcomes in college. The

Texas Success Initiative program is required at all public institutions of higher education.

Similar to the TASP, there are a number of exemptions established by the Texas Higher

Education Coordinating Board (THECB) including ACT score (composite score of 23,

with minimum of 19 on the English or mathematics sections for exemption) and SAT

score (combined critical reading and mathematics score of 1070, with at least 500 in the

critical reading and mathematics sections for exemption), in addition to minimum scores

on the Texas Assessment of Academic Skills (TAAS), Texas Assessment of Knowledge

and Skills (TAKS), or State of Texas Assessments of Academic Readiness (STAAR). If

students to not meet these thresholds, they will be required to take the TSI Assessment,

which will determine whether they will be relegated to developmental coursework in

English or mathematics as an undergraduate student (Texas Administrative Code §4.54).

      The Texas Success Initiative (TSI) was passed via a series of legislative

proceedings in April 2003. Senator Eliot Shapleigh (D-El Paso) authored Senate Bill 286

during the 78th Texas Legislature. This piece of legislation, commonly referred to as the

Texas Higher Education Coordinating Board (THECB) Sunset Bill, established that the

THECB would continue for an additional twelve years (until 2015), while also tightening

measures and strategies for higher education in the state of Texas. The Sunset Advisory

Commission, which was created by the Texas Legislature over thirty years ago, provides open communication about the legislative process in addition to providing a community forum for political matters of the state. Through the Sunset Advisory Commission a series of recommendations were developed during the 78th Legislative year for improvements within Texas public higher education.

Through Texas SB 286, two of the recommendations to the 78th Texas Legislature were to "focus the Coordinating Board on assessing the most effective actions and strategies to achieve the goals of Closing the Gaps" while also forming a P-16 Council for Texas. These two initiatives helped in the reorganization of the Texas Academic Skills Program into the Texas Success Initiative program. The formal development of the P-16 council created a network between top administration of the State Board for Educator Certification (SBEC), Texas Department of Assistive and Rehabilitative Services (TDARS), Texas Education Agency (TEA), and Texas Higher Education Coordinating Board (THECB). This council, established in 2003, began meeting to discuss all levels of education but was also increasingly concerned about students' preparation between high school and college.

Once SB 286 was passed, both the Texas Education Code and the Texas Higher Education Coordinating Board enacted policies for the TSI program. The Texas Education Code created Section 21.3062 (Success Initiative) that became effective at all institutions of higher education on September 1, 2003. On December 2, 2003, the Texas Higher Education Coordinating Board adopted Chapter 4 (Rules Applying to All Public Institutions of Higher Education in Texas), Subchapter C (Texas Success Initiative).

Students are initially accepted to Texas public colleges without regard to the TSI program, but then are required to provide either exemption documentation or passing scores on the approved instruments prior to enrolling in freshman-level coursework. Through the Texas Top 10% admissions policy (Texas House Bill 588), many students who are accepted to public institutions will not be TSI complete through SAT/ACT score exemptions. Therefore, institutions must provide developmental education programs for those students who are not exempt and who do not pass an assessment instrument prior to matriculation. At the same time, by providing this developmental education, institutions are increasing the students' chance of college success.

Texas college financing. Political, business, and educational leaders in Texas are acutely aware of the growing need to recruit, educate, train, retain, and graduate a talented workforce that will remain in the state long past graduation, driving Texas' capacity to develop and attract new industry. As educational stakeholders in the state of Texas assessed the landscape and economic outcomes concerning a growing population in the mid-to-late 1990s, many came to realize that the goals to be attained in Closing the Gaps would not be possible, much less successful, unless the Texas Legislature assisted with affordability polices to ensure that students would be able to enroll at institutions of higher education. Further, institutions of higher education had become increasingly aware of the lengthening time that it takes for students to graduate with an undergraduate degree; according to Texas Higher Education Facts (2006), only 52.6% of students completed their undergraduate degree within six years in 2005. The Texas Legislature became instrumental starting in the 76th legislative session in assisting with higher education affordability and encouraging an efficient path to degree. The state of Texas

developed both loan and grant programs to supplement the shrinking federal financial aid along with determining structured policy concerning time to degree for students in higher education.

Enrollment caps. For many undergraduate advisors at Texas public institutions of higher education, spring 2006 brought unexpected news for their students from the Texas legislature: enrollment caps and tuition premiums for excessive and/or repeated semester credit hours. Though much of the debate concerning policy and standards to help promote timely undergraduate graduation in Texas occurred in spring 2005, individual college and university policies were not unveiled until the next year. At the Central South University, for example, a notice on the Provost's website went live under a page entitled "Student Interest" on April 25, 2006, with information about enrollment caps and how students would be affected.

In order to assist undergraduate students in timely graduation, the Texas legislature determined that students would be charged a premium tuition rate once they reached the enrollment cap. This enrollment cap is also known as the 45/30 hour rule to most undergraduates; this cap is defined as the maximum number of hours a student can take in excess of their degree requirement. Thus, if a student's degree required 120 hours and they entered fall 2001, their enrollment cap would be 165 hours; if a student entered fall 2006 with the same degree, their enrollment cap would be 150 hours. Students who enrolled at a Texas public institution of higher education for the first time between fall 1999 and summer 2006 would have a 45-hour cap and students who enrolled fall 2006 and after would have 30 hour cap. Students whose first semester in a Texas public

institution of higher education was prior to fall 1999 are exempt from the enrollment cap

and premium tuition charges.

During the 78th Legislature, Representative Fred Brown (R-College Station),

Higher Education Committee Chair, authored House Bill 1172. The main points of

Texas House Bill 1172 include the following:

- Institutional reporting on efforts concerning timely graduation

- Tuition premiums for repeated or excessive undergraduate hours

- Defining of semester credit hours required for a baccalaureate degree

With the approval of HB 1172, institutions would no longer be eligible for formula

funding once students have reached their individual enrollment cap (either 45 or 30

hours, depending on their first semester of enrollment). Additionally, once students reach

their enrollment cap, they would be required to pay premium tuition (at non-resident

rates). Most recently and in further support of timely degree completion, Representative

Dan Branch (R-Dallas) authored House Bill 3025 during the 82nd Legislature that

mandates all students to file a degree plan after 45 semester credit hours of coursework.

Further, HB 3025 established the creation of statewide transfer agreements in

coordination with the Texas Higher Education Coordinating Board along with institutions

of higher education in order to facilitate student transfers and timely graduation.

As state-mandated policy, there are a number of implications for both

undergraduate students and Texas public institutions of higher education for the

enrollment cap and associated tuition premiums. The overarching strength of this policy

is that it seeks to graduate more Texas students with a baccalaureate degree in six years

or less by providing a structure both for the institution through reporting measures and

academic advising/degree plan monitoring, and for the student by providing incentives
not to exceed the enrollment cap. The policy does not take into account many of the
exceptions that may occur such as Advanced Placement (AP) credits, dual-credit
coursework while still in high school, and college preparatory programs that award
college credit from the time a student is a sophomore in high school. However, the
policy both recognizes and exempts remedial/developmental coursework from the
enrollment cap and tuition premiums at Texas public institutions of higher education.

Gaps in Literature

As the literature suggests, there are a number of individual and systemic factors
that affect Latino student persistence at four-year institutions. Based on information that
has been collected for this cohort, the study will help examine how variables such as
gender, ethnicity, high school rank, high school grade point average (GPA), SAT, ACT,
remediation requirements, first-year GPA, semester credit hour load, and academic
program/major might affect a student's persistence to graduation. There is a gap in the
literature concerning how remediation requirements specifically affect persistence rates
of Latino students as well as gaps concerning financial aid. Unfortunately, the data
provided for this study do not include student financial aid information.

Previous research related to financial need and student persistence has largely
been in two major fields: the effects of student aid on persistence in college (Astin, 1975;
Cabrera et al., 1992; St. John, 1989) and on determinants of educational attainment
(Stampen & Cabrera, 1986; Jensen, 1981; St. John, 1989). Astin examined the effects of
financial aid on student persistence by using self-reported data and specifically
researching how different types of aid (merit, loan, gift, work study, etc.) affect

persistence rates (1975). Astin's research showed that college work-study had the most positive impact on student persistence while financial aid loans were associated with decreased persistence (1975). Jensen's research on student financial aid and persistence in college (1981) showed that aid has small positive effects on persistence but that increased amounts of aid has insignificant negative effects, likely due to loan increases in larger student financial aid packages. In Tinto's model, though finances are recognized as important in the selection of educational goals and where students enroll (both pre-college decisions), they are not necessarily indicative of student persistence (1975).

Conclusion

This study will allow for the development of regression analyses to help determine how remediation requirements in addition to how semester credit hour enrollment impacts persistence rates of Latino students. Based on the results of this study, a formative evaluation of university remediation requirements could be assessed to determine efficacy for the Latino student. Further, if it is determined that the time to degree and semester credit hour enrollment is statistically significant between Latino and White undergraduate students, an intervention program could be developed in order to support Latino students' trajectory to graduation.

Chapter III

Methodology

The purpose of this chapter is to describe data sources used and methods that will be undertaken in order to conduct this study based on the following research questions:

1. Among Latino students, how do academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing and first-semester credit hour load impact institutional first-year GPA?

2. Among Latino students, how do academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and first-semester credit hour load predict the likelihood of persistence to graduation?

Null Hypotheses

1. There will be no statistically significant difference between Latino students' institutional first-year GPA based on academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and first-semester credit hour load.

2. There will be no statistically significant difference among Latino students for predicting persistence and graduation based on academic entry characteristics such as SAT/ACT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and semester credit hour load.

Setting

The study will be conducted at a public, doctoral-degree granting public institution in the southern region of the United States, which will be known as Central South University. Central South University (CSU) is a Carnegie Foundation-designated Research University (very high research activity), which in fall 2003 had a population of 35,066 students (26,283 undergraduates). Student distribution by ethnicity includes 13% African-American, 19% Asian/Pacific Islander, 18% Latino, 8% International, 0.5% Native American, 39.5% White/Other, and 2% Unknown. In fall 2003, the Central South University matriculated 3325 first-time in college (FTIC) students, and the average cost for an in-state student was $13,068 for the academic year (Office of Institutional Research at Central South University, 2003-04).

Participants

The participants for the study will include the entering class who were accepted and enrolled in at least 1 semester credit hour as first-time in college freshmen to the Central South University for fall 2003. Student distribution by ethnicity includes 17.93% African-American, 25.20% Asian/Pacific Islander, 21.71% Latino, 3.36% International, 0.18% Native American, 30.95% White/Other, and 0.67% Unknown. Student distribution by gender includes 50.58% female and 49.42% male (see Table 2).

Table 2

Descriptive Statistics by Race/Ethnicity and Gender

Race/Ethnicity	Gender	Headcount	Percentage
African-American	Female	349	10.57%
	Male	243	7.36%
	Subtotal	592	17.93%
Asian/Pacific Islander	Female	404	12.24%
	Male	428	12.96%
	Subtotal	832	25.20%
Latino	Female	373	11.30%
	Male	344	10.42%
	Subtotal	717	21.71%
International	Female	55	1.67%
	Male	56	1.70%
	Subtotal	111	3.36%
Native American	Female	2	0.06%
	Male	4	0.12%
	Subtotal	6	0.18%
White/Other	Female	474	14.35%
	Male	548	16.60%
	Subtotal	1022	30.95%
Unknown	Female	13	0.39%
	Male	9	0.27%
	Subtotal	22	0.67%
All Students	Female	1670	50.58%
	Male	1632	49.42%
	Total	3302	100.00%

Data

This study utilizes historical data that were collected at the time of application and subsequent admission as well as enrollment from fall 2003 through summer 2009. After approval from the Central South University Committee for the Protection of Human Subjects was granted, the Office of Institutional Research produced a dataset from archival records maintained through the university's student information system. This student information system collects and integrates all applicable data concerning a student's application, admission, enrollment, and graduation.

Profile data. The study includes the entire dataset of the entering fall 2003 class of 3302 first-time in college students and was provided by the Central South University's Office of Institutional Research in two files: student information and course information. The student information file for the fall 2003 cohort includes individual student code, gender, ethnicity, high school name, SAT critical reading score, SAT mathematics score, SAT total, ACT English score, ACT mathematics score, ACT composite, high school grade point average (GPA), high school rank, high school class size, major for each semester enrolled, semester GPA for each semester enrolled, cumulative GPA for each semester enrolled, academic year graduated, degree earned, time to degree (TTD), years to complete, and indicators for required remediation in mathematics, reading, and writing. The course information file for the fall 2003 cohort includes individual student code, subject, catalog number, section number, course grade, semester of course registration, and semester credit hours (SCH) awarded for course. Prior to receiving the dataset from the Office of Institutional Research, each student was given a unique individual student code that prohibited identification while allowing for appropriate semester-to-semester student tracking.

Variables in the Study

The academic entry (pre-college) variables that will be utilized in this study are based on both traditional admissions standards as well as persistence literature (Adelman, 2004; Braxton, 2000; Herzog, 2005; Pascarella & Terenzini, 2005). The pre-college variables that will be analyzed include SAT/ACT scores, high school class rank, and high school GPA. In concert with academic entry variables, the following current college data will be included for analysis: a flag indicating remediation requirements (mathematics,

reading, and or writing); semester credit load (as measured by semester credit hours), academic performance during the first year (as measured by the first-year cumulative grade point average), and retention to graduation (as measured by successful completion of college by summer 2009).

Data Analysis Procedures

Hierarchical multiple linear and logistic regression analyses will be used to test the models in order to determine the contribution of academic entry and current college variables on academic achievement (grade point average) and persistence to graduation. Multiple linear regression techniques will be utilized to determine the contribution of the independent variables on academic achievement during the first-year; logistic regression analysis will be utilized to identify the variables that are relevant to the outcome measure of persistence to graduation as measured by graduation by summer 2009 (1 = persist to graduation and 0 = non-persist to graduation).

In the following chapters, the results and ensuing discussion will be presented.

Chapter IV

Results

The purpose of this chapter is to describe the results for this study; the results for this study will be discussed in three sections. The first section will present descriptive statistics for all ethnicities/races as well as the target population of the study, Latino students, in addition frequencies of pertinent predictor variables. The second section will present the results of the hierarchical multiple regression to determine how academic entry characteristics, remediation requirements, and semester credit hour load impact institutional first-year GPA. The third section will present the results of the hierarchical logistic regression to understand the extent to which academic entry characteristics, remediation requirements, and semester credit hour load in the first year predict the likelihood of persistence to graduation within 6 years.

Descriptive Statistics and Frequencies

The means and standard deviations for the total population of students in all race/ethnicity categories are reported in Table 3 and for the study sample of all Latino students in Table 4. For the total population, means among potential variables that influence academic achievement and persistence to graduation was as follows: the cumulative spring 2004 grade point average was 2.48, with 0.40 mean for graduating within 6 years, 1058 SAT, 3.18 high school grade point average, and top 29.88% class rank in high school. Four categories were created to determine frequency and means for the remediation requirement: 0 for no remediation required, 1 for 1 remediation course required, 2 for 2 remediation courses required, and 3 for all remediation courses required in mathematics, reading, and writing. For the total population, the mean for remediation

required was 0.18 which is further explained through the following frequencies: 2908

students did not require any remediation coursework, 262 students required one

remediation course, 78 students required two remediation courses, and 54 students

required all three remediation courses, for a total percentage of 11.93% requiring some

remediation coursework. In reviewing first year semester credit hour loads, four

categories were utilized: 0 for no semester enrollment, 1 for less than 12 semester credit

hours (less than full-time enrollment), 2 for 12 to 14 semester credit hours, and 3 for

more than 15 semester credit hours (which is both an university scholarship requirement

and the standard degree requirement for a four-year graduation with a total of 120 credit

hours over 8 semesters). For the total population, the fall 2003 semester credit hour mean

was 2.10 and the spring 2004 semester credit hour was 1.99.

Table 3

*Means and Standards Deviations among Potential Variables that Influence Academic
Achievement and Persistence to Graduation for all Ethnicities/Races*

	Mean	Standard Deviation	N
Cumulative Spring 2004 GPA	2.4758	0.95694	3302
Graduated in 6 Years or Not	0.40	0.489	3302
SAT	1057.80	147.222	3252
High School GPA	3.175879	0.4417689	3149
High School Rank (Percentile)	70.2210	21.34906	2957
Remediation Required	0.18	0.539	3302
Fall 2003 SCHs	2.10	0.510	3302
Spring 2004 SCHs	1.99	0.834	3302

Overall, the Latino student population metrics were lower than the general population

means among potential variables that influence academic achievement and persistence to

graduation with the following: the cumulative spring 2004 grade point average was 2.38,

with 0.35 mean for graduating within 6 years, 1021 SAT, 3.17 high school grade point

average, and top 27.11% class rank in high school. For the study sample, the mean for

remediation required was 0.15 which is further explained through the following

frequencies: 637 students did not require any remediation coursework, 59 students

required one remediation course, 16 students required two remediation courses, and 5

students required all three remediation courses, for a total percentage of 11.16% requiring

some remediation coursework. For Latino students, the fall 2003 semester credit hour

mean was 2.05 and the spring 2004 semester credit hour mean was 1.90.

Table 4

Means and Standards Deviations among Potential Variables that Influence Academic Achievement and Persistence to Graduation for Latino Students

	Mean	Standard Deviation	N
Spring 2004 Cumulative GPA	2.3776	0.93504	717
Graduated within 6 Years or Not	0.35	0.478	717
SAT	1021.40	132.234	709
High School GPA	3.16658	0.431015	690
High School Rank (Percentile)	72.8894	20.73917	649
Remediation Required	0.15	0.461	717
Fall 2003 SCHs	2.05	0.486	717
Spring 2004 SCHs	1.90	0.819	717

The cumulative grade point averages and attempted credit hours by race/ethnicity

for the total population are reported in Table 5. For the total population, the first-year

cumulative GPA (for both fall 2003 and spring 2004) was 2.48 with a mean of 24.52

attempted semester credit hours (which equates to full-time status over the course of the

academic year). For Latino students, the first-year cumulative GPA was 2.38 with a

mean of 23.86 attempted semester credit hours (which equates to less than full-time status

over the course of the academic year).

Table 5

First Year Cumulative GPAs and Attempted Semester Credit Hours (SCHs) by Race/Ethnicity

Race/Ethnicity	1st Year Cumulative GPA [Mean]	Standard Deviation	1st Year SCHs Attempted [Mean]	Standard Deviation	N
African-American	2.1652	.951	24.52	4.951	592
Asian/Pacific Islander	2.6897	.892	25.06	4.410	832
Latino	2.3768	.937	23.86	4.952	717
International	2.8223	.860	24.30	5.513	111
Native American	2.2295	.582	26.67	2.160	6
White/Other	2.5151	.982	24.60	6.102	1022
Unknown	2.4637	.813	22.73	6.599	22
Total	2.4758	.957	24.52	5.255	3302

Persistence to graduation within 6 years for the total population is reported in Table 6. For all races/ethnicities, 39.73% of the student population graduated within 6 years, with a total of 1312 students graduating with 712 females (42.63% of total female population) and 600 males (36.76% of total male population). For Latino students, 35.29% of the students persisted to graduation within the same timeframe, with a total of 253 graduates with 142 females (38.07% of Latina population) and 111 males (32.27% of Latino population).

Table 6

Persistence to Graduation within 6 Years by Race/Ethnicity

Race/Ethnicity	Did not Graduate within 6 years	Graduated within 6 years	Total	Percent Graduated within 6 years
African-American	417	175	592	29.56%
Asian/Pacific Islander	432	400	832	48.08%
Latino	464	253	717	35.29%
International	52	59	111	53.15%
Native American	4	2	6	33.33%
White/Other	608	414	1022	40.51%
Unknown	13	9	22	40.91%
Total	1990	1312	3302	39.73%

Hierarchical Multiple Linear Regression Analysis

A hierarchical multiple linear regression was conducted to determine how academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and semester credit hour load impact institutional first-year grade point average. Hierarchical multiple regression requires that the minimum ratio of valid cases to independent variables be at least five to one. The ratio of valid cases (649) to number of independent variables (7) was 92.7 to 1, which is greater than or equal to the minimum ratio. The requirement for a minimum ratio of cases to independent variables is satisfied. Additionally, the ratio of 92.7 to 1 satisfies the preferred ratio of 15 cases per independent variable.

Table 7 displays the correlations among the dependent and predictor variables (spring 2004 cumulative grade point average, gender, SAT, high school GPA, high

school class rank, remediation required, fall 2003 semester credit hours, and spring 2004 semester credit hours). There were several significant correlations found; all variables except for gender were found to have significant correlations of various strengths. All three academic entry characteristics are positively correlated to spring 2004 academic achievement, with SAT at 0.212, high school GPA at 0.379, and high school class rank at 0.245. The remediation requirement variable was found to have a significant negative relationship at -0.187, while fall 2003 semester credit hours and spring 2004 semester credit hours are positively correlated at 0.252 and 0.453 respectively. The strongest relationships for spring 2004 cumulative GPA were with high school GPA (0.379) and spring 2004 semester credit hours (0.453).

Table 7

Pearson Correlations of Dependent and Predictor Variables

	1	2	3	4	5	6	7	8
1	1.000							
2	-.070	1.000						
3	.212**	.167**	1.000					
4	.379**	-.157**	.152**	1.000				
5	.245**	-.165**	.019	.661**	1.000			
6	-.187**	.025	-.284**	-.212**	-.147**	1.000		
7	.252**	.013	.210**	.166**	.108*	-.051	1.000	
8	.453**	-.010	.132**	.156**	.090	-.099*	.275**	1.000

Note. ** = $p \le .001$ and * = $p \le .05$; 1. Spring 2004 Cumulative GPA; 2. Gender; 3. SAT; 4. High School GPA; 5. High School Class Rank; 6. Remediation Required; 7. Fall 2003 Semester Credit Hours; 8. Spring 2004 Semester Credit Hours.

Results of the hierarchical multiple linear regression can be found in Table 8. In the first block of the regression, gender was entered. Gender accounted for 0.3% of the variance in academic achievement as measured by spring 2004 cumulative GPA (Adjusted R^2 = .003). Even though it appeared that Latino males were graduating at

lower rates than their Latina counterparts (32.27% to 38.07%), this was not a significant contributing factor to academic achievement.

In the second step of the regression, the academic entry characteristics (SAT, high school rank, and high school GPA) were entered. The block of variables, when entered together, accounted for 16.5% of the variance in academic achievement as measured by spring 2004 GPA (Adjusted $R^2 = 0.165$, $p < .001$). As shown in Table 8, the block of academic entry characteristic variables was a significant predictor of academic achievement.

In the third step of the regression, remediation requirements were entered. This variable was not found to be significant and only accounted for .3% of the variance in academic achievement, moving from 16.5% in the second step to 16.8% in the third step (Adjusted $R^2 = 0.168$). Based on these results, academic achievement for students with remediation requirements was not significant; however, only 11.16% of the Latino population required remediation coursework so this result could be skewed by the small sample size.

In the fourth step of the regression, fall 2003 and spring 2004 semester credit hours were entered. This block of variables, in conjunction with blocks 1-3, accounted for 31.8% of the variance in academic achievement as measured by spring 2004 GPA (Adjusted $R^2 = 0.318$, $p < .001$). As shown in Table 8, this final block of semester credit hours for the fall 2003 and spring 2004 was a significant predictor of academic achievement.

Table 8

Prediction of Academic Achievement (Spring 2004 cumulative GPA) from Gender, High School Characteristics, Remediation Requirements, and Semester Course Hours in the First Year

	R	R^2	Adj. R^2	Std. Error of the Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
						Change Statistics			
1	.070[a]	.005	.003	.93349	.005	3.084	1	628	.080
2	.412[b]	.170	.165	.85459	.165	41.438	3	625	.000
3	.418[c]	.175	.168	.85282	.005	3.608	1	624	.058
4	.571[d]	.326	.318	.77204	.151	69.701	2	622	.000

Note. a. Predictors: Spring 2004 Cumulative GPA, Gender; b. Predictors: Spring 2004 Cumulative GPA, Gender, SAT, HS Rank, HS GPA; c. Predictors: Spring 2004 Cumulative GPA, Gender, SAT, HS Rank, HS GPA, Remediation Required; d. Predictors: Spring 2004 Cumulative GPA, Gender, SAT, HS Rank, HS GPA, Remediation Required, Fall 2003 Semester Course Hours, Spring 2004 Semester Course Hours

Table 9 presents the effects of the predictor variables on academic achievement. The following variables contributed most significantly to academic achievement: spring 2004 semester credit hours (B = .420, p ≤ .001), high school GPA (B = 584, p ≤ .001), SAT (B = .001, p ≤ .05) and fall 2003 semester credit hours (B = .160, p ≤ .05). Finally, the ANOVA indicates that the model as a whole is significant [F (7, 622) = 42.95, p < .001]. Further, in reviewing the P-P plot of regression, there were no major deviations from normality and the scatterplot was roughly rectangularly distributed, with most of the scores concentrated in the center, along the 0 point; both of these measures are indicative of a good fit to the model and the assumption of homoscedasticity between the predicted dependent variable scores and the errors of prediction.

Table 9

Effects of the Predictor Variables on Academic Achievement

Criteria	Step One (Beta)	Step Two (Beta)	Step Three (Beta)	Step Four (Beta)
Gender	-.131	-.080	-.074	-.071
SAT		.001**	.001**	.001*
High School GPA		.738**	.717**	.584**
High School Rank		.000	.000	.000
Remediation Required			-.149	-.123
Fall 2003 SCHs				.160*
Spring 2004 SCHs				.420**

Note. ** = $p \leq .001$ and * = $p \leq .05$

Hierarchical Logistic Regression Analysis

A hierarchical logistic regression was performed to assess the impact of a number

of variables on the likelihood for Latino students to graduate within 6 years. These

variables included gender, academic entry characteristics (SAT, high school GPA, and

high school class rank), and remediation requirements, as well as fall 2003 and spring

2004 semester credit hours. Of the total Latino population of 717 students, 624 were

included in analysis due to 93 missing cases. The hierarchical logistic regression was

entered in four steps: step one included gender, step two included academic entry

characteristics, step three included remediation requirements (0 = no remediation, 1 = one

course, 2 = two courses, and 3 = three courses of mathematics, reading, and/or writing),

and step four included fall 2003 and spring 2004 semester credit hours (0 = no

enrollment, 1 = less than 12 SCHs, 2 = 12-14 SCHs, and 3 = 15 SCHs or more). The

summary of the hierarchical logistic regression predicting persistence to graduation

within 6 years is presented in Table 10.

Table 10

Effects of Gender, Academic Entry Characteristics, Remediation Requirements, and Semester Credit Hour Load in the First Year on Persistence to Graduation Within 6 Years

	B	S.E.	ß
Step 1			
Gender	.293	.168	1.341
Step 2			
Gender	.177	.180	1.193
SAT	.001	.001	1.001
HS GPA	1.233	.288	3.432**
HS Rank	.001	.006	1.001
Step 3			
Gender	.164	.181	1.178
SAT	.000	.001	1.000
HS GPA	1.213	.292	3.363**
HS Rank	.000	.006	1.000
Rem. Req.			
Rem. Req. (1)	20.255	22901.112	626239360.892
Rem. Req. (2)	19.862	22901.112	422549215.827
Rem. Req. (3)	20.359	22901.112	694879877.809
Step 4			
Gender	.182	.190	1.199
SAT	.000	.001	1.000
HS GPA	1.062	.307	2.892**
HS Rank	.000	.006	1.00
Rem. Req.			
Rem. Req. (1)	20.556	22854.552	845828193.050
Rem. Req. (2)	20.338	22854.552	679934394.957
Rem. Req. (3)	20.838	22854.552	1122065462.925
Fall 2003 SCH			
Fall 2003 SCH (1)	-.885	.437	.413*
Fall 2003 SCH (2)	-.464	.271	.629
Spring 2004 SCH			
Spring 2004 SCH (1)	-3.265	.753	.038**
Spring 2004 SCH (2)	-1.786	.403	.168**
Spring 2004 SCH (3)	-.752	.228	.472**

Note. ** = $p \leq .001$ and * = $p \leq .05$

For step one, gender was not found to be a significant predictor on persistence to graduation within 6 years for Latino students. The chi-square value was F (1) = 3.059 (p = .080). Only .5% (Cox and Snell R Square) and .7% (Nagelkerke R Square) variability was explained by gender. The Hosmer and Lemeshow test indicated that this step was a poor fit with a significance of p < .05.

For step two, academic entry characteristics were found to be a significant predictor on persistence to graduation within 6 years for Latino students. The chi-square value was F (3) = 40.275 (p = .000). The model summary indicated that 6.7% and 9.2% of the variability was explained by academic entry characteristics (with the Cox and Snell R Square = .067 and Nagelkerke R Square = .092). The Hosmer and Lemeshow test indicated that this step was a good fit with a significance value of .067. In this step, high school GPA was found to be significant with ß = 3.432 (p ≤ .001).

For step three, remediation requirements were not found to be a significant predictor on persistence to graduation within 6 years for Latino students. The chi-square value was F (3) = 3.063 (p = .382). The model summary indicated that 7.2% and 9.8% of the variability was explained by remediation requirements with the Cox and Snell R Square = .072 and Nagelkerke R Square = .098). This was only a change of .005 and .006 from the results in step 2. As a model, the Hosmer and Lemeshow test indicated that this step was a good fit with a significance value of .222. High school GPA remained significant with ß = 3.363 (p ≤ .001).

For the final step, fall 2003 and spring 2004 semester credit hours were found to be a significant predictor on persistence to graduation within 6 years for Latino students. The chi-square value was F (5) = 65.184 (p = .000). The Hosmer and Lemeshow test

indicated that this a good fit with a significance value of .433. In this step, spring 2004

semester credit hours were found to be significant with ß = .038 (p ≤ .001) for category 1

(less than 12 SCHs), ß = .168 (p ≤ .001) for category 2 (12 SCHs or more), and ß = .472

(p ≤ .001) for category 3 (15 SCHs or more) as compared to fall 2003 semester credit

hours, which were only found to be significant at ß = .413 (p ≤ .05) for category 1 (less

than 12 SCHs). The model as a whole explained between 16.4% (Cox and Snell R

Square) and 22.5% (Nagelkerke R Square) of the variance in persistence to graduation

within 6 years and correctly classified 69.2% of cases.

Summary of Results

The multiple hierarchical linear regression analysis confirmed that the

demographic of gender had no predictive value on academic achievement at the

conclusion of the first year, while both high school characteristics (SAT score, high

school rank, and high school GPA) and semester course hour load had moderate

predictive value (16.5% and 31.8%, respectively) at a statistically significant level [F (7)

= 42.95, p < .001]. The hierarchical logistic regression analysis confirmed that a full

model with semester course hour load had a moderate predictive value (16.4-22.5%) with

percentage accuracy in classification of 69.2% at a statistically significant level [F (5) =

65.18, p < .001].

The final chapter discusses these results in the context of previous research and

the current educational landscape. Additionally, it identifies what implications these

results may have on practice at institutions of higher education, future research, and the

limitations of this study.

Chapter V

Conclusion

The purpose of this chapter is to provide an interpretation of the results that were presented in chapter four and discuss how they relate to previous literature as well as the current educational landscape. This chapter will discuss the implication that this study's results have for current leadership at institutions of higher education, as well as limitations of the study and recommendations for future research.

Research Question One

Research question one [among Latino students, how do academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and first-semester credit hour load impact institutional first-year GPA?] was assessed using multiple hierarchical linear regression analysis. This analysis confirmed that the demographic of gender had no predictive value on academic achievement at the conclusion of the first year, while both high school characteristics (SAT score, high school rank, and high school GPA) and semester course hour load had moderate predictive value (16.5% and 31.8%, respectively) at a statistically significant level [$F (7) = 42.95$, $p < .001$].

Whereas each of the four models of student persistence in chapter II (see Figures 1-4) identified that pre-college factors (including high school characteristics described in the study) either directly or indirectly impact student success, the models did not specifically study the impact of semester course hour load (Bean, 1980; Cabrera, Nora, & Castaneda, 1992; Spady, 1970; Tinto, 1994). The results of this study also supported that high school performance (as measured by grade point average and class rank) is a

predictor of academic success in college (Astin & Oseguera, 2005; Ruban & Nora, 2002; Tinto, 2003).

Research Question Two

Research question two [among Latino students, how do academic entry characteristics such as SAT score, high school GPA, and high school class rank, along with remediation requirements (mathematics, reading, and/or writing) and first-semester credit hour load predict the likelihood of persistence to graduation?] was assessed using hierarchical logistic regression analysis. This analysis confirmed that a full model with semester course hour load had a moderate predictive value (16.4-22.5%) with percentage accuracy in classification of 69.2% at a statistically significant level [F (5) = 65.18, p < .001].

Though Adelman (1999, 2006) found that students with remediation requirements are less likely to persist to graduation than their peers who did not have remediation requirements, this study did not find statistically significant results in support of this; however, the sample of students with remediation required was less than 12% of the Latino freshman population at CSU in fall 2003. The study did not find gender to be a statistically significant factor for persistence to graduation despite the fact that 38.07% Latinas graduated within 6 years (142 out of 373 Latinas) as compared to 32.27% Latinos in the same time period (111 out of 344 Latinos); these graduation rates are in support of the shrinking male minority population at institutions of higher education, though the disparity between genders is less stark due to the diverse study body at CSU (Astin & Oseguera, 2005; College Board, 2010). Similar to Radford and Horn's (2012) findings, students at full-time status (12 semester credit hours) were more likely to persist to

graduation and students with 15 semester credit hours had an increased likelihood to graduate within 6 years.

Implications for Practice

Even though the Latino population is in the swells of a dramatic population growth that will account for an increase to over 25% of the population of the nation by 2050, Latinos continue to be underrepresented in both K-12 and higher education relative to their representation in the United States population (Bell & Bautsch, 2011; Cerna, Perez, & Saenz, 2009; Llagas & Snyder, 2003). Despite targeted attention at both the federal and state level, Latinos remain both the largest and least educated minority population in the United States (Bailey & Dynarski, 2011; THECB, 2013; U.S. Census Bureau, 2009; U.S. Census Bureau, 2010).

Based on what is currently known about the educational trends of Latino students, this study can provide institutions of higher education additional information about college attendance behaviors as it relates to student success, particularly concerning the number of semester credit hours that students take during their first year. During the course of this study, Central South University increased the number of semester credit hours required for scholarship students from 12 to 15 semester credit hours, aligning with the results that students with full-time enrollment (12 semester credit hours or more) performed better than students with less than full-time enrollment (fewer than 12 semester credit hours), but also that students with 15 semester credit hours or more (category 3 in the regression analyses) were more likely to graduate within 6 years.

Based on more recent studies, states and colleges (including, but not limited to, Hawaii, Minnesota, and Texas) have initiated programs that promote students taking 15

semester credit hours per semester and linking semester credit hour load (enrollment intensity) to scholarships and financial aid (Klempin, 2014; Skomsvold, Radford, & Berkner, 2011). Practitioners at institutions higher education should develop programs promoting enrollment intensity, not only with scholarship and financial aid incentives, with information for students, parents, and advisors connecting how course loads of 15 semester credits hours or more is directly related to persistence to graduation and future success.

Limitations of Study

There are several limitations to this study that may have affected the results. The reliance on secondary data limits the number of questions that can be answered as well as the specific population analyzed. Additionally, the results of the study will only be generalizable to institutions that are similar to Central South University, which has a diverse demographic and academic profile.

Additionally, the lack of student financial information is a significant limitation of the study due to the fact that student persistence research and analysis have focused more on the role that finances play in college attendance (DesJardins, Ahlburg, & McCall, 2002; Herzog, 2005; St. John, Paulsen, & Carter, 2005). Whereas the seminal theories of student departure (Bean, 1980; Tinto, 1975, 1997) were based on academically and financially homogeneous full-time cohorts, new freshmen are more heterogeneous, with an influx of first-generation, low-income, and ethnically diverse backgrounds (Braxton, 2000; Herzog, 2005).

However, Bean (1980) did hypothesize that financial concerns can be a reason to drop out of college. Based on the changing and evolving student entering college, further

research has suggested that institutions are utilizing financial aid to help improve retention efforts by allowing students to work less than they would otherwise (DesJardins et al., 2002; St. John, Andrieu, Oescher, & Starkey, 1994). St. John, Cabrera, Nora, and Asker (2000) found that financial aid has an indirect effect on student engagement; financial aid reduces the need for students to work and allows for social engagement.

Finally, the dataset utilized in this study is from the first-time in college class of fall 2003 and follows the population through summer 2009. The age of this dataset is a limitation, as the demographics at Central South University have changed, with the Latino population increasing and the institution becoming a Hispanic-Serving Institution in 2012 with over 25% of the student population identified as Latino (U.S. Department of Postsecondary Education, 2012). Due to the changing population during a critical campaign for increased participation and success in higher education (Closing the Gaps, 2015), this study cannot appropriately address current federal and state trends for Latino students due to age and scope.

Recommendations for Future Research

While the findings are potentially limited to institutions of higher education that have a similar demographic profile as Central South University, further studies could explore impact of scholarships on persistence to graduation and semester course hour load as well as major choice and federal financial aid eligibility. Though robust research has been conducted on the effects of financial aid on persistence in college (Astin, 1975; Bailey & Dynarski, 2011; Cabrera et al., 1992; St. John, 1989), it has also been shown that the timing of when a student files for financial aid as well as which students file for federal financial aid can be instrumental in persistence to graduation (McKinney &

Novak, 2015). As states and colleges are beginning to develop persistence to graduation

programs that not only link 15 semester credit hour loads to financial aid but timing of

when a student files for financial aid, it will be important for future researchers to study

the outcomes of the programs and develop best practices for institutions and update

financial aid policies to accommodate future student success (Klempin, 2014).

Unfortunately, this data does not connect with student experiences at the

institution and overall student engagement, which literature suggests can be even more

important than academic entry characteristics (Kuh, 2001; Kuh, et. al., 2008). The results

of the study suggest that more needs to be done specific to the Latino population in order

to engage and support throughout the undergraduate career for timely degree attainment

(40.97% of total population graduated within 6 years, as compared to 35.29% of the

Latino population). Additionally, since the subset of remediation required students

within the Latino population was small (80 students of the 717 Latino population), it

cannot be definitively determined whether the remediation requirement influences both

first-year academic success and persistence to graduation; future research should work

with a larger population in order to determine the influence of remediation requirements,

as Braxton et al. (2014), Adelman (1999, 2006), and Bettinger and Long (2009) reported

conflicting results.

Further, the study did not analyze the connection between first-year cumulative

grade point average with persistence to graduation within 6 years; Nora and Cabrera

(1996) found that grade point average was three times as critical to college persistence for

Latino students as compared to their White counterparts. As the study only analyzed

Latino students, this statistic could not be supported or denied, but should be included in

future research in order to better equip practitioners with data points that could be helpful in advising students in and through their first year of college.

Conclusion

The goal of this study was to provide insight into the complex landscape of undergraduate degree acquisition for Latino students; reviewing and analyzing various data points to ascertain college attendance trends and trajectories provided a lens in which to make recommendations for future students in college as well as higher education practitioners and higher education stakeholders nationwide. This study supported persistence and student success research indicators, including the significance of academic entry characteristics (SAT score, high school grade point average, and high school class rank) and semester credit hour load (enrollment intensity) on both first-year GPA and persistence to graduation within 6 years. This study provides research which links Latino enrollment intensity between both student success in the first year and persistence to graduation, which allows for further institutional programming and evaluation.

References

Adelman, C. (1999). *Answers in the tool box: Academy intensity, attendance patterns, and bachelor's degree attainment.* Washington, DC: U.S. Department of Education.

Adelman, C. (2004). *Principal indicators of student academic histories in postsecondary education, 1972-2000*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.

Adelman, C. (2006). *The toolbox revisited: paths to degree completion from high school through college*. Washington, D.C.: U.S. Department of Education.

Andres, L. & Carpenter, S. (1997). *Today's higher education students: Issues of admission, retention, transfer, and attrition in relation to changing student demographics*. Vancouver, BC: British Columbia Council on Admissions and Transfer.

Arbona, C. & Nora, A. (2007). Predicting college attainment of Hispanic students: Individual, institutional, and environmental factors. *The Review of Higher Education, 30*(3), 247-270.

Astin, A.W. (1975). *Preventing students from dropping out.* San Francisco, CA: Jossey-Bass.

Astin, A. W. (1977). *Four critical years*. San Francisco, CA: Jossey-Bass.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, *25*, 297-308.

Astin, A.W. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.

Astin, A.W. (2005). Making sense out of degree completion rates. *Journal of College Student Retention, 7*, 5-17.

Astin, A.W., & Oseguera, L. (2002). *Degree attainment rates at American college and universities.* Los Angeles, CA: University of California, Higher Education Research Institute.

Astin, A.W., and Oseguera, L. (2005). *Degree attainment rates at American colleges and universities: Effects of race, gender, and institutional type*. Los Angeles, CA: Higher Education Research Institute.

Attewell, P., Lavin, D., Domina, T., & Levey, T. (2006). New evidence on college remediation. *Journal of Higher Education, 77,* 886-924.

Baime, D. S., & Mullin, C. M. (2011, July). Promoting educational opportunity: The pell grant program at community colleges (Policy Brief 2011-03PBL). Washington, DC: American Association of Community Colleges.

Bailey, M.J. & Dynarski, S.M. (2011, December). Gains and gaps: Changing inequality in U.S. college entry and completion (Working Paper17633). Boston, MA: National Bureau of Economic Research.

Beal, P. E. & Noel, L. (1980). *What works in student retention*. Iowa City, IA: American College Testing Program and the National Center for Higher Education Management Systems.

Bean, J.P. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education, 12*, 155-187.

Bean, J. P. (1983). The application of a model of turnover in work organizations to the student attrition process. *Review of Higher Education*, 6, 129-148.

Bean, J. P. (1985). Interaction effects based on class level in an exploratory model of college student dropout syndrome. *American Educational Research Journal, 22,* 35-64.

Bean, J.P. (1990). Why students leave: Insights from research. In D. Hossler & J.P. Bean (Eds.), *The strategic management of college enrollments.* (pp. 147-169). San Francisco, CA: Jossey-Bass.

Bean, J.P. & Eaton, S. (2002). The psychology underlying successful retention practices. *Journal of College Student Retention 3*(1), 73-89.

Bean, J., & Metzner, B.S. (1987). The estimation of a conceptual model of nontraditional undergraduate students' attrition. *Research in Higher Education , 27*, 15-38.

Bell, J.D. & Bautsch, B. (2011, February). Improving Latino college completion: What state legislators should know. Washington, DC: National Conference of State Legislators.

Berger, J. B. (2000). Organizational behavior at colleges and student outcomes: A new perspective on college impact. *The Review of Higher Education, 23*(1): 61-83.

Berger, J. B., Blanco Ramirez, G. & Lyon, S. (2012). Past to present: A historical examination of retention, p. 1-31 in A. Seidman (ed.) *College Student Retention: Formula for Student Success* (2nd ed.). Lanham, MD: ACE/Preager.

Berger, J.B. & Braxton, J.M. (1998). Revising Tinto's interactionalist theory of student departure through theory elaboration: Examining the role of organizational attributes in the persistence process. *Research in Higher Education, 39*(2), 103-119.

Berger, J.B. & Lyon, S.C (2005). Past to present: A historical look at retention. In A.

    Seidman (Ed.), *College student retention: Formula for student success* (pp. 1-29).

    Westport, CT: Praeger Publishers.

Bettinger, E. and Long, E.T. (2009). Addressing the needs of under‐ prepared college

    students: Does college remediation work? *Journal of Human Resources 44*(3):

    736–771.

Blanc, R.A., DeBuhr, L.E., & Martin, D.C. (1983). Breaking the attrition cycle: The

    effects of supplemental instruction on undergraduate performance and attrition.

    Journal of Higher Education, 54, 80-90.

Blau, P.M. (1964). *Exchange and power in social life*. New York, NY: Wiley.

Bordes, V., & Arredondo, P. (2005). Mentoring and 1st-year Latina/o college students.

    Journal of Hispanic Higher Education, 4, 114-133.

Braxton, J.M. (Ed.). (2000). *Reworking the student departure puzzle*. Nashville, TN:

    Vanderbilt University Press.

Braxton, J.M., Doyle, W.R., Hartley III, H.V., Hirschy, A.S., Jones, W.A., & McLendon,

    M.K. (2014). *Rethinking college student retention*. San Francisco: Jossey-Bass.

Braxton, J.M., Hirschy, A.S., and McClendon, S.A. *Toward understanding and reducing

    college student departure*. ASHE-ERIC Higher Education Report, vol. 30, no. 3.

    San Francisco, CA: Jossey-Bass, 2004.

Burgdorf, B. D., & K. Kostka. (2006). *Eliminating complexity and inconsistency in

    federal financial aid programs for higher education students: Secretary of

    Education's Commission on the Future of Higher Education*. Washington DC:

    U.S. Department of Education.

Cabrera, A.F., Stampen, J.O., and Hansen, W.L. (1990). Exploring the effects of ability to pay on persistence in college. *Review of Higher Education,* 13(3), 303–336.

Cabrera, A.F., Nora, A., & Castaneda, M.B. (1992). The role of finances in the persistence model: A structural model. *Research in Higher Education, 33*(5), 571-593.

Cabrera, A.F., Nora, A., & Castaneda, M.B. (1993). College persistence: Structural equations modeling text of an integrated model of student retention. *The Journal of Higher Education, 64*(2), 123-139.

Carey, K. (2004, May). *A matter of degrees: Improving graduation rates in four-year colleges and universities.* Washington, DC: Education Trust.

Carnegie Foundation for the Advancement of Teaching (n.d.). The Carnegie classification of institutions of higher education. Retrieved April 8, 2014, from http://classifications.carnegiefoundation.org.

Castillo, L.G., Conoley, C.W., Choi-Pearson, C., Archuleta, D.J., Phoummarath, M.J., & Van Landingham, A. (2006). University environment as a mediator of Latino ethnic identity and persistence attitudes. *Journal of Counseling Psychology, 53,* 267-271.

Cerna, O.S., Perez, P.A, & Saenz, V. (2009). Examining the precollege attributes and values of latina/o bachelor's degree attainers. *Journal of Hispanic Higher Education,* 8(2), 130-157.

Cofer, J., & Somers, P. (2000). Within-year persistence of students at two-year colleges. *Community College Journal of Research and Practice, 24*, 785-807.

Cohen, A., and Brawer, F.B. (2008). *The American Community College* (5th ed.). San
 Francisco: Jossey-Bass.

College Board. (2009). *Trends in college pricing*. Retrieved January 16, 2010 from
 http://www.trends-collegeboard.com/college_pricing/pdf/
 2009_Trends_College_Pricing.pdf.

College Board. (January 2010). The educational crisis facing young men of color.
 Retrieved July 23, 2015 from https://professionals.collegeboard.com/
 profdownload/educational-crisis-facing-young-men-of-color.pdf.

Creusere, M., Fletcher, C., Neal, M., Shook, M. (2011, November). *State of student aid
 and higher education in Texas*. Retrieved May 14, 2013, from
 http://www.tgslc.org/pdf/SOSA.pdf.

DesJardins, S.L., Ahlburg, A.A, & McCall, B.P. (1999). An event history model of
 student departure. *Economic Educational Review, 18*, 375-390.

DesJardins, S.L., Ahlburg, A.A, & McCall, B.P. (2002). A temporal investigation of
 factors related to timely degree completion. *The Journal of Higher Education,
 73*(5), 555-581.

Durkheim, E., & Simpson, G. (1966). *Suicide: A Study in Sociology.* Transl. by John A.
 Spaulding and George Simpson. New York, NY: Routledge & Kegan Paul.

Feldman, K.A. & Newcomb, T.M. (1969). *The impact of college on students*. San
 Francisco, CA: Jossey-Bass.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Los Angeles, CA: SAGE
 Publications.

Fry, R. (2002). *Latinos in higher education: Many enroll, too few graduate*. Washington, DC: Pew Hispanic Center.

Fry, R. (2004). *Latino youth finishing college: The role of selective pathways*. Washington, DC: Pew Hispanic Center.

Gardner, J.N. (2001). Focusing on the first-year student. *Priorities*, *17*(3), 1-18.

Gross, J.P.K., Hossler, D., & Ziskin, M. (2007). Institutional aid and student persistence: An analysis of the effects of institutional financial aid at public four-year institutions. *NASFAA Journal of Student Financial Aid, 37*(1), 28-39.

Harris, A., & Tienda, M. (2010). Minority Higher Education Pipeline: Consequences of Changes in College Admissions Policy in Texas. *Annals of the American Academy of Political and Social Science, 627*(Jan), 60-81.

Harvey, W.B. (2003). *Minorities in higher education: 2002-2003*. Twentieth Annual Status Report. Washington, DC: American Council on Education.

Hawley, T.H., & Harris, T.A. (2005). Student characteristics related to persistence for first-year community college students. *Journal of College Student Retention, 7*, 117-142.

Haynes, R.M. (2008). The impact of financial aid on postsecondary persistence: A review of the literature. *NASFAA Journal of Student Financial Aid, 37*(3), 30-35.

Herman, J. L., Morris, L. L., & Fitz-Gibbon, C. T. (1987). *Evaluator's handbook*. Newbury Park, CA: SAGE Publications.

Hernandez, J.C., & Lopez, M.A. (2004). Leaking pipeline: Issues impacting Latino/a college student retention. *Journal of College Student Retention, 6*, 37-60.

Herzog, S. (2005). Measuring determinants of student return vs. dropout/stopout vs. transfer: A first-to-second year analysis of new freshmen. *Research in Higher Education, 46*(8), 883-928.

Hossler, D., Schmit, J., & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. Baltimore, MD: The Johns Hopkins University Press.

Iffert, R.E. (1956). Study of college student retention and withdrawal. *College and University, 31,* 435-37.

Ishitani, T.T. (2003). A longitudinal approach to assessing attrition behavior among first-generation students: Time varying effects of pre-college characteristics. *Research in Higher Education, 44*, 433-449.

Jensen, E.L. (1981). Student financial aid and persistence in college. *The Journal of Higher Education, 52*(3), 280-294.

Joo, S.H., Durband, D.B. & Grable, J. (2008). The academic impact of financial stress on college students. *Journal of College Student Retention, 10*(3), 287-305.

Kelly, J.T., Kendrick, M.M., Newgent, R.A., & Lucas, C.J. (2007). Strategies for student transition to college: A proactive approach. *College Student Journal, 41*(4), 1021-1035.

Keup, J.R. (2005). The impact of curricular interventions on intended second year re-enrollment. *Journal of College Student Retention, 7,* 61-89.

Kitchen, S. (2004, January 23). Tech's new program to help students graduate in 4 years. Retrieved May 20, 2007, from http://www.amarillo.com/stories/012304/tex_techprogram.shtml

Klempin, S. (September 2014). *Redefining full-time in college: Evidence on 15-credit strategies*. Community College Research Center: Teachers College, Columbia University.

Kuh, G. D. (2001). *The national survey of student engagement: Conceptual framework and overview of psychometric properties*. Bloomington, IN: Indiana University Center for Postsecondary Research.

Kuh, G.D., Cruce, T.M., Shoup, R., Kinzie, J., & Gonyea, R.M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education, 79*(5), 540-563.

Kuh, G.D., Kinzie, J., Schuh, J.H., Whitt, E.J., & Associates (2005). *Student success in college: Creating conditions that matter*. San Francisco, CA: Jossey-Bass.

Lee, W. (1999). Striving toward effective retention: The effect of race on mentoring African American students. *Peabody Journal of Education, 74*, 27-43.

Leon, D.J., Dougherty, K.A., & Maitland, C. (1997). *Mentoring minorities in higher education: Passing the torch*. Washington, DC: National Education Association.

Levin, M. & Levin, J. (1991). A critical examination of academic retention programs for at-risk minority college students. *Journal of College Student Development, 32*, 323-334.

Levine, A. & Cureton, J.S. (1998). *When hope and fear collide: A portrait of today's college student.* San Francisco, CA: Jossey-Bass.

Llagas, C., & Snyder, T.D. (2003). *Status and trends in the education of Hispanics*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Lotkowski, V. A., Robbins, S. B., & Noeth, R. J. (2004). The role of academic and non-academic factors in improving college retention. Retrieved March 22, 2008, from http://www.act.org/research/policymakers/pdf/college_retention.pdf

Lyons, A.C. & Hunt, J.L. (2003). Credit practices and financial education needs of community college students. *College Student Journal, 31*, 323-332.

Maggio, J. C., White, W. G., Molstad, S., & Kher, N. (2005). Prefreshman summer programs' impact on student achievement and retention. *Journal of Developmental Education, 29*(2), 2-8, 32-33.

Martorell, P., & McFarlin Jr, I. (2011). Help or hindrance? The effects of college remediation on academic and labor market outcomes. *The Review of Economics and Statistics*, *93*(2), 436-454.

McKinney, L. & Novak, H. (2015). FAFSA filing among first-year college students: Who files on time, who doesn't, and why does it matter? *Research in Higher Education, 56*(1), 1-28.

Merisotis, J. P., & Phipps, R. A. (2000). Remedial education in colleges and universities: What's really going on? *Review of Higher Education, 24*, 67-85.

Morris, L. L., Fitz-Gibbon, C. T., & Freeman, M. E. (1987). *How to communicate evaluation findings*. Newbury Park, CA: SAGE Publications.

Mortenson, T.G. (2005). Measurements of persistence. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 1-29). Westport, CT: Praeger Publishers.

Murillo, Jr., E.G, Villenas, S.A., Galvan, R.T., Munoz, J.S., Martinez, C., & Machado-Casas, M. (2010). *Handbook of Latinos and education: Theory, research, and practice* (Ed.). New York, NY: Routledge.

National Center for Education Statistics. (1995). *Profile of undergraduates in U.S. post-secondary education institutions: 1992-93.* NCES 96-237. Washington: U.S. Department of Education.

National Center for Education Statistics. (2002). *Profile of undergraduates in U.S. post-secondary institutions: 1999-2000.* NCES 2002-168. Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (2006). Enrollment in postsecondary institutions, fall 2004; graduation rates, 1998 & 2001 cohorts, and financial statistics, fiscal year 2004. NCES 2006-155. Washington, DC: U.S. Department of Education.

Nelsen, R. S. (2003, July/Aug/Sept). B on time: The law of unintended consequences. Texas Association of College Teachers Quarterly eBulletin. Retrieved May 20, 2007 from http://www.tact.org/ebullsep03/epage6.shtml

Nora, A. (1987). Determinants of retention among Chicano students: A structural model. *Research in Higher Education 26*(1): 31–59.

Nora, A. (1990). Campus-based programs as determinants of retention among Hispanic college students. *Journal of Higher Education, 61*(3): 312–331.

Nora, A. (2001). How minority students finance their higher education. ERIC Digest, 171, ERIC Clearinghouse on Urban Education, Office of Educational Research and Improvement, U.S. Department of Education.

Nora, A. & Cabrera, A.F. (1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. *Journal of Higher Education, 67*(2), 119-148.

Nye, F.I. (1979). Choice, Exchange, and the Family. In *Contemporary Theories About the Family,* ed. W. Burr, R. Hill, F. I. Nye, and I. Reiss. New York, NY: The Free Press.

O'Connor, N., Hammack, F. M., & Scott, M. A. (2010). Social capital, financial knowledge, and Hispanic student college choices. *Research in Higher Education*, *51*(3), 195-219.

Oseguera, L., Locks, A.M., & Vega, I.I. (2009). Increasing Latina/o students' baccalaureate attainment: A focus on retention. *Journal of Hispanic Higher Education*, *8*(1), 23-53.

Otero, R., Rivas, O., & Rivera, R. (2007). Predicting persistence of Hispanic students in their 1st year of college. *Journal of Hispanic Higher Education*, *6*(2), 163-173.

Padilla, R. (2007). *Camino a la universidad: The road to college.* Lumina Foundation for Education, Indianapolis, IN.

Pallant, J. (2013). *SPSS survival manual (5th ed.).* New York: McGraw-Hill Education.

Pascarella, E.T., & Terenzini, P.T. (1991). *How college affects students*. San Francisco, CA: Jossey-Bass.

Pascarella, E.T., & Terenzini, P.T. (2006). *How college affects students: Findings and insights from thirty years of research*. San Francisco, CA: Jossey-Bass.

Paulsen, M.B. & St. John, E.P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *Journal of Higher Education, 73*(2), 189-236.

Perna, L.W. (1998). The contribution of financial aid to undergraduate persistence. *Journal of Student Financial Aid*, 28(3), 25-40.

Perry, L.B. (2003) Key concepts in democracy and education. *Education and Society*, *21* (3).

Porter, A.C. (1989). A curriculum out of balance: The case of elementary school mathematics. *Educational Researcher, 18*(5), 9–15.

Radford, A. & Horn, L. (November 2012). *Web tables: An overview of classes taken and credits earned by beginning postsecondary students*. NCES2013-151rev.

Raimst, L. (1981). College student attrition and retention. College Board Report No. 81-1. New York, NY: College Entrance Examination Report.

Rickinson, B., & Rutherford, D. (1995). Increasing undergraduate student retention rates. *British Journal of Guidance and Counseling*, *23*, 161-172.

Roueche, J. (1993). *Between a rock and a hard place: The at-risk student in the open-door college.* San Francisco, CA: Jossey-Bass.

Ruban, L., & Nora, A. (2002, April). *Factors impacting the academic status of undergraduate students at four-year institutions*. Paper presented at the Annual Meeting of the American Educational Research Association: New Orleans, LA.

Salinas A., & Llanes, J. (2003). Student attrition, retention, and persistence: The case of the University of Texas Pan American. *Journal of Hispanic Higher Education*, *2*, 73-97.

Santa Rita, E. & Bacote, J. B. (1997). The benefits of college discovery prefreshman summer program from minority and low-income students. *College Student Journal, 31*, 161-173.

Schreiner, L. A., Noel, P., & Cantwell, L. (2011). The impact of faculty and staff on high-risk college student persistence. *Journal of College Student Development*, *52*(3), 321-338.

Seidman, A. (2005). *College student retention: Formula for student success*. Westport, CT: Praeger Publishers.

Seidman, A. (2012). *College student retention: Formula for student success* (2nd edition). Lanham, MD: ACE/Praeger.

Shrestha, L.B. & Heisler, E.J. (2011, March). The changing demographic profile of the United States (Congressional Research Report RL32701). Washington, DC: Congressional Research Service (CRS) Report for Congress.

Skomsvold, P., Radford, A., & Berkner, L. (July 2011). *Web tables: Six-year attainment, persistence, transfer, retention, and withdrawal rates of students who began postsecondary education in 2003-04*. NCES2011-152.

Skowron, E.A., Wester, S., & Azen, R. (2004). Differentiation of self mediates college stress and adjustment. *Journal of Counseling and Development, 82*, 69-78.

Sloan, C.B. (2006). High school graduation in Texas. Bethesda, MD: Educational Projects in Education Research Center. Retrieved May 15, 2013, from http://www. edweek. org/media/texas_eperc. pdf..

Spady, W.G. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange 1*(April): 64–85.

Spady, W. G. (1975). Competency based education as a framework for analyzing school reform. In *Proceedings of the Third Annual Conference of the Sociology of Education Association*.

Stampen, J.O., and Cabrera, A.F. (1986). Exploring the effects of student aid on attrition.*Journal of Student Financial Aid* 16: 28–40.

St. John, E.P. (1989). The influence of student aid on persistence. *Journal of Student Financial Aid, 19*(3), 52-68.

St. John, E., Andrieu, S., Oescher, J., & Starkey, J. (1994). The influence of student aid on within-year persistence by traditional college-age students at four-year colleges. *Research in Higher Education, 35,* 455-480.

St. John, E.P., Cabrera, A.F., Nora, A., & Asker, E.H. (2000). Economic perspectives on student persistence. In J. Braxton (Ed.), *Rethinking the departure puzzle: New theory and research on college student retention* (pp. 29-47). Nashville, TN: Vanderbilt University Press.

St. John, E.P., Paulsen, M.B., & Carter, D.F. (2005). Diversity, college costs, and postsecondary opportunity: An examination of the financial nexus between college choice and persistence for African Americans and whites. *The Journal of Higher Education, 76*(5), 545-569.

Stratton, L. S., O'Toole, D. M., & Wetzel, J. N. (2007). Are the factors affecting dropout behavior related to initial enrollment intensity for college undergraduates?. *Research in Higher Education*, *48*(4), 453-485.

Stratton, L. S., O'Toole, D. M., & Wetzel, J. N. (2008). A multinomial logit model of

    college stopout and dropout behavior. *Economics of Education Review*, *27*(3),

    319-331.

Summerskill, J. (1962). Dropouts from colleges. In N. Sanford (ed.) *The American*

    college: A psychological and social interpretation of higher learning. New York,

    NY: John Wiley and Sons.

Sunset Advisory Commission. (n.d.). Retrieved May 20, 2007, from

    http://www.sunset.state.tx.us/

Swail, W.S., Cabrera, A.F. & Lee, C. (2004). *Latino youth and the pathway to college*.

    Washington, DC: Pew Hispanic Center.

Swanson, C.B. (2006). Tracking US trends. *Education Week*, *25*(35), 50-55.

Taylor, P. & Cohn, D. (2012). A milestone en route to a majority minority nation. Pew

    Social and Demographic Trends, Pew Research Center. Retrieved May 15, 2013,

    from http://www. pewsocialtrends. org/2012/11/07/a-milestone-en-route-to-a-

    majority-minoritynation.

 Texas Administrative Code (2013). Texas success intiative: Exemptions, exceptions,

    and waivers. Retrieved May 6, 2014, from

    http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_r

    loc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=19&pt=1&ch=4&rl=54

Texas Education Code. (1999). TEXAS grant program: Section 56.301. Retrieved April

    18, 2014, from http://www.senate.state.tx.us/75r/senate/.../0426-THECB-2.pdf

Texas Education Code. (2003). Texas success initiative: Sec 51.3062. Retrieved October

    20, 2007, from http://tlo2.tlc.state.tx.us/statutes/edtoc.html

Texas Education Code. (2003, June 22). Texas B-On-Time loan program: Section 56, subchapter Q. Retrieved May 20, 2007, from http://tlo2.tlc.state.tx.us/statutes/docs/ED/content/htm/ed.003.00.000056.00.htm#56.463.00

Texas Education Code. (2005). Funding for certain excess undergraduate credit hours: Section 61.0595. Retrieved October 20, 2007, from http://tlo2.tlc.state.tx.us/statutes/edtoc.html

Texas Education Code. (2005, June 18). Tuition for repeated or excessive undergraduate hours: Section 54.014. Retrieved April 18, 2014, from http://law.onecle.com/texas/education/54.014.00.html

Texas Education Code. (2005, June 18). Semester credit hours required for baccalaureate degree: Section 61.0515. Retrieved April 18, 2014, from http://law.onecle.com/texas/education/61.0515.00.html

Texas Education Code. (2005, September 1). Tuition for repeated or excessive undergraduate hours: Section 54.068. Retrieved May 20, 2007, from http://tlo2.tlc.state.tx.us/statutes/edtoc.html

Texas Education Code. (2006, May 26). Advancement of college readiness in curriculum: Section 28.008. Retrieved April 18, 2014, from http://law.onecle.com/texas/education/28.008.00.html.

Texas Higher Education Coordinating Board. (n.d.). Closing the gaps by 2015: The Texas higher education plan. Retrieved May 20, 2015, from http://www.thecb.state.tx.us/index.cfm?objectid=858D2E7C-F5C8-97E9-0CDEB3037C1C2CA3

Texas Higher Education Coordinating Board. (n.d.). Texas B-On-Time loan program fact

      sheet. Retrieved October 20, 2007, from

      http://www.hhloans.com/borrowers/BOTFactSheet.cfm

Texas Higher Education Coordinating Board. (n.d.). Texas B-On-Time loan program

      handbook. Retrieved May 12, 2007, from

      http://www.hhloans.com/Insts/BOTHandbook.pdf

Texas Higher Education Coordinating Board. (n.d.). Texas higher education facts—2006.

      Retrieved October 20, 2007, from

      http://www.thecb.state.tx.us/Reports/PDF/1096.PDF

Texas Higher Education Coordinating Board. (2003, December 3). Chapter 4. Rules

      applying to all public institutions of higher education in Texas, Subchapter C.

Texas Higher Education Coordinating Board, Texas Administrative Code. (2003,

      December 7). Chapter 21. Student services, Subchapter E. Texas B-On-Time loan

      program. Retrieved May 20, 2007, from

      http://www.thecb.state.tx.us/rules/tac3.cfm?Chapter_ID=21&Subchapter=E

Texas Higher Education Coordinating Board, Texas Administrative Code. (2005,

      November 22). Chapter 13. Financial planning, Subchapter F. Formula funding

      and tuition charges for repeated and excess credit hours of undergraduate

      students. Retrieved May 20, 2007, from http://www.thecb.state.tx.us/rules/

      tac3.cfm?Chapter_ID=13&Subchapter=F#13.108

Texas Legislature. (2003, April 22). Texas senate bill 286. Retrieved May 20, 2007, from

      http://www.capitol.state.tx.us/BillLookup/History.aspx?

      LegSess=78R&Bill=SB28

Texas Legislature. (2003, June 20). Texas senate bill 4. Retrieved May 20, 2007, from

http://www.capitol.state.tx.us/BillLookup/history.aspx?LegSess=78R&Bill=SB4

Texas Legislature. (2005, June 18). Texas house bill 1172. Retrieved March 20, 2007,

from http://www.capitol.state.tx.us/BillLookup/

history.aspx?LegSess=79R&Bill=HB1172

Texas Legislature. (2005, September 1). Texas senate bill 1528. Retrieved May 20, 2007,

from http://www.capitol.state.tx.us/BillLookup/

history.aspx?LegSess=79R&Bill=HB1172

Texas success initiative. Retrieved October 20, 2007, from

http://www.thecb.state.tx.us/Rules/tac3.cfm?Chapter_ID=4&Subchapter=C

Thompson, D.E., Orr, B., Thompson, C., & Grover, K. (2007). Examining students'

perceptions of their first-semester experience at a major land-grant institution.

College Student Journal, 41(3), 640-648.

Tienda, M. (2006, February). Harnessing diversity in higher education: Lessons from

Texas. In *Ford policy forum* (53-56).

Tienda, M., & Sullivan, T. A. (2009). The promise and peril of the Texas uniform

admission law. *The next twenty five years*, 155-174.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent

research. *Review of Educational Research, 45*(1), 89-125.

Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher

Education* 53: 687–700.

Tinto, V. (1987).*Leaving College: Rethinking the Causes and Cures of Student Attrition*.

Chicago, IL: University of Chicago Press.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cure of student attrition* (2nd ed.). Chicago, IL: University of Chicago Press.

Tinto, V. (1994). Discovering the sources of student success. In D. Floyd (Ed.), from *Vision to reality: Student affairs agenda in the '90s*. Iowa City: American College Testing Program.

Tinto, V. (1997). *Leaving college: Rethinking the causes and cures of student attrition* (3rd edition). Chicago, IL: University of Chicago Press.

Tinto, V. (1998). Colleges as communities: Taking research on student persistence seriously. *The Review of Higher Education*, *21*(2), 167-177.

Tinto, V. (2003). Learning better together: The impact of learning communities on student success. *Higher Education monograph series*, *1*(8).

Tinto, V. (2005). Reflections on student retention and persistence: Moving to a theory of institutional action on behalf of student success. *Studies in Learning, Evaluation, Innovation and Development*, *2* (December 2005)

Tinto, V. (2012). *Completing college: Rethinking institutional action*. Chicago, IL: University of Chicago Press.

Titus, M.A. (2006). Understanding the influence of the financial context of institutions on student persistence at four-year college and universities. *The Journal of Higher Education*, *77*(2), 353-375.

Tobolowsky, B. F. (2005). *The 2003 national survey on first-year seminars: Continuing innovations in the collegiate curriculum* (Monograph N. 41). Columbia, SC: University of South Carolina, National Resources Center for the First-Year Experience and Students in Transition.

Umoh, U. & Eddy, J. (1994). Factors related to student retention in community college developmental education mathematics. *Community College Review, 22*, 37-77.

Upcraft, M.L. & Garder, J.N. (1989). *The freshman year experience: Helping students survive and succeed in college*. San Francisco, CA: Jossey-Bass.

U.S. Department of Labor. (2004). 2005-06 edition of the occupational outlook handbook and the career guide to industries available on the internet. Washington, DC: Bureau of Labor Statistics.

Van Gennep, A. (1961). *The rites of passage*. Chicago, IL: University of Chicago Press.

Vega, A., & Martinez, R. (2012). A Latino scorecard for higher education: A focus on Texas universities. *Journal of Hispanic Higher Education*, *11*(1), 41-54.

Verdugo, R. (2006). A report on the status of Hispanics in education: Overcoming a history of neglect. Washington, DC: National Education Association of the United States. Human and Civil Rights. Retrieved April, 18, 2014.

Voorhees, R.A. (1985). Financial aid and persistence: Do the federal campus-based aid programs make a difference? *Journal of Student Financial Aid*,*15*, 21–30.

Wagner, W.E. (2015). *Using IBM SPSS statistics for research methods and social science statistics*. Los Angeles, CA: SAGE Publications.

Wright, S. W. (Fall, 1996). Community colleges and universities must turn out more graduates, Texas panel says. *Black Issues in Higher Education, 13*, 10-17.

Yosso, T.J. & Solorzano, D.G. (2006, March). *Leaks in the Chicana and Chicano educational pipeline* (Latino Policy & Issues Brief No. 13). Los Angeles, CA: UCLA Chicano Studies Research Center.

Zurita, M. (2005). Stopping out and persisting: Experiences of Latino undergraduates.

Journal of College Student Retention, 6, 301-324.

Appendix A

Committee for the Protection of Human Subjects Approval

UNIVERSITY of **HOUSTON**

DIVISION OF RESEARCH

July 7, 2014

Ms. Brenda Rhoden
c/o Dr. Catherine Horn
Curriculum and Instruction

Dear Ms. Brenda Rhoden,

Based upon your request for exempt status, an administrative review of your research proposal entitled "Understanding Undergraduate Latino Student Persistence and Academic Performance" was conducted on May 14, 2014.

At that time, your request for exemption under **Category 4** was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. * Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Nettie Martinez at 713-743-9211.

Sincerely yours,

Kirstin Rochford, MPH, CIP, CPIA
Director, Research Compliance

*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **July 6, 2019**. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 14405-EX