

PREDICTORS OF COLLEGE READINESS: AN ANALYSIS OF
THE STUDENT READINESS INVENTORY

James K. Wilson, III, M.Ed.

Dissertation Prepared for the Degree of
DOCTOR OF EDUCATION

UNIVERSITY OF NORTH TEXAS

May 2012

APPROVED:

Jane B. Huffman, Major Professor
James D. Laney, Minor Professor
John C. Brooks, Committee Member
Grant W. Simpson, Committee Member
Nancy J. Nelson, Chair of the Department
of Teacher Education and
Administration
Jerry Thomas, Dean of the College of
Education
James D. Meernik, Acting Dean of the
Toulouse Graduate School

Wilson III, James K. Predictors of College Readiness: An Analysis of the Student Readiness Inventory. Doctor of Education (Education Administration), May 2012, 75 pp., 4 tables, references, 78 titles.

The purpose of this study was to better predict how a first semester college freshman becomes prepared for college. The theoretical framework guiding this study is Vrooms' expectancy theory, motivation plays a a key role in success. This study used a hierarchical multiple regression model. The independent variables of interest included high school percentile class rank, composite ACT scores, composite SAT scores, and the 10 themes as measured by the Student Readiness Inventory (SRI) to address two research questions: What are the psychosocial factors identified by the SRI are most relevant in predicting college success? What conventional academic indicators are most relevant in predicting college success? The sample size for this study was 5279 (n), including a stratified random sample of first semester college freshman enrolled in credit bearing courses; these participants were deemed college ready by the university. Academic Discipline accounted for 4.2% of the variance in first semester college GPA, General Determination accounted for 1.7% of the variance, and the remaining psychosocial factors of the SRI accounted for less than 1% of the variance. High school percentile class rank accounted for 10.7% of the variance, composite ACT accounted for 5.9% of the variance, and composite SAT accounted for 5.6% of the variance. Future analysis could be completed within demographic groups to include a stratified random sample of participants by ethnicity, gender, or economic status. Such analysis would build on this body of research providing additional guidance admission officers and K-12 educators.

Copyright 2012

By

James K. Wilson, III

ACKNOWLEDGMENTS

It is with my deepest gratitude and appreciation that I acknowledge those who have encouraged, supported, and believed in me throughout this journey.

First, I acknowledge my major professor, Dr. Jane Huffman, for her unwavering support, patience and guidance. You provided the perfect balance of praise and pressure that kept me focused on my goal. I would also like to extend my thanks to my doctoral committee for their advice and partnership in this process. To Dr. Jim Laney, Dr. John Brooks and Dr. Grant Simpson, your wisdom and direction were invaluable and inspiring.

Next, this dissertation would not have been possible without the encouragement and support of my friends and colleagues. You have provided resources, advice, participation and proofreading every time I needed help and did so with affirmation and encouragement; A special thank you to Dr. Colleen Eddy for guiding me through the literature review, and Dr. Jimmy Byrd for his assistance with methods.

Finally, I would like to acknowledge the most important people in my life, my family. You have all loved and believed in me even when I was uncertain of my own abilities. I am blessed beyond measure to have each of you in my life. To my mother, Dodie, I feel your presence in my life every day, and I see your heart and kindness in both Macie and Makenzie. To Melanie, Makenzie, and Macie, I love you all more than words could ever express. You have each sacrificed and endured so much so I could achieve this dream. To my Dad, thank you for instilling persistence and a sense of worth in me. You all make every day better and fill my life with greatness.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	iii
LIST OF TABLES.....	vi
CHAPTER 1 INTRODUCTION.....	1
Background of the Study.....	1
Problem Statement.....	1
Purpose of the Study.....	3
Theoretical Framework.....	4
Research Questions.....	4
Significance of the Study.....	5
Delimitations and Limitations.....	7
Assumptions.....	8
Definition of Terms.....	8
Organization of Study.....	9
CHAPTER 2 REVIEW OF THE LITERATURE.....	11
Introduction.....	11
High School Reform.....	12
Development of College and Career Readiness Indicators.....	16
The Predictors of College Success.....	23
SAT and ACT Scores.....	23
College GPA.....	26
Specific Course Grades.....	27
Student Motivation and Engagement.....	31
Student Readiness Inventory.....	34
Chapter Summary.....	36
CHAPTER 3 METHODOLOGY.....	38
Introduction.....	38
Research Design.....	38
Population and Sample.....	40
Variables.....	42
Instrumentation.....	43
Student Readiness Inventory.....	43

Data Collection.....	43
Delimitations and Limitations	44
Assumptions	45
Data Analysis	46
Chapter Summary	47
CHAPTER 4 RESULTS.....	48
Introduction	48
General Model Requirements	48
Multiple Regression	49
Descriptive Statistics.....	50
Relevance level of Psychosocial Factors on First Semester GPA	52
Relevance Level of Academic Factors on First Semester GPA	53
Relevance Level of Academic and Psychosocial Factors on First Semester GPA	53
Conclusion	56
CHAPTER 5 DISCUSSION	57
Introduction	57
Statement of Problem	57
Review of Methodology.....	58
Summary of Results.....	59
Research Question 1	59
Research Question 2	60
Discussion of the Results.....	60
Interpretation of the Findings	60
Relationship to Research.....	62
Suggestions for Further Study	64
Implications of the Study.....	65
Summary.....	66
REFERENCES.....	68

LIST OF TABLES

Table		Page
1.	Descriptive Statistics for Study Participants	48
2.	Correlation among Psychosocial Factors	50
3.	Correlation among Academic Variables	51
4.	Correlation of Academic and Psychosocial Variables	63

CHAPTER 1

INTRODUCTION

Background of the Study

Today's high school graduates must possess the skills and knowledge to adapt rapidly to the ever-changing demands of a knowledge-based economy. According to the Education Commission of States (2005), students now need at least two years of postsecondary education to be successful in a workforce that requires advanced skills. The goal of K-12 education should be to prepare high school graduates for life after high school by teaching them the skills and knowledge that are essential for students to be ready for college level work (Boon, 2008). Greene and Forster (2003) report that 32% of all high school graduates are actually prepared for college level work, and in minority populations, the numbers are even lower with a 20% rate for black students and a 16% rate for Hispanic students. Additionally, only 1 in 4 American College Test (ACT)-tested 2007 high school graduates are prepared for entry-level college courses in the four core areas of English composition, algebra, social science, and biology (ACT, 2008). With such dismal statistical evidence, it is essential for public school educators and higher education to accurately identify specific indicators that reliably predict post secondary success, and once identified, establish specific actions that K-12 educators should take to increase the college readiness of high school students.

Problem Statement

States are heavily invested in the academic programs and success of their residents. The economic future of the nation is connected closely to the success of its

educational institutions. According to The College Board (Lee, 2008), the typical full-time year-round worker with a four-year college degree earns 60% more than high school graduates over their working lives. Those with master's degrees earn almost twice as much, and those with professional degrees earn almost three times as much. The current pressure for improvement in secondary and post secondary education creates an environment where positive results are expected in the education of students, in their matriculation through the educational system, and their progress towards a college degree. In 2010, the Bureau of Labor Statistics reported 70.1 percent of 2009 high school graduates were enrolled in colleges or universities. The numbers of students enrolling in post secondary education continues to increase, and educators cannot continue to facilitate positive student outcomes without first understanding the factors related to college student academic performance. The search for predictors of college success has long been a research theme in the literature (Conley, 2007a; Goodman, 1944; Reid & Moore, 2008; Robbins, Lauver, Le, Davis, Langlely, & Carlstrom 2004).According to the research, success in college is strongly related to precollege academic preparation as well as other factors such as family income and parents' education (Kuh, Kinzie, Cruce, Shoup, & Gonyea, 2008).

To address this situation, educators may be advised to expand the conventional predictors of college readiness (ACT scores, Scholastic Aptitude Test (SAT) scores, high school class rank, high school course work performance) to include specific psychosocial factors contributing to college readiness. These psychosocial factors include academic discipline, general determination, goal striving, commitment to college, study skills, communication, social connection, social activity, academic self-

confidence, and steadiness (Le, Casillas, Robbins, & Langley, 2005). An understanding of these psychosocial factors would assist colleges by targeting key areas for developmental intervention to reduce both the academic and the persistence risk of students entering college. In addition, once these specific psychosocial factors are understood, K-12 educators could develop proactive systems of preparation resulting in a more college ready graduate.

The problem for this study, therefore, was to analyze the predictive relationships between conventional predictors of college readiness and other academic and social factors that may be better predictors of college success. Vroom's Expectancy Theory (1964) suggested the attractiveness of future outcomes may be an explanation as to why some people are motivated to excel, while others are not. Measuring this attractiveness to future outcomes has long been a mystery. This study used American College Testing's (ACT) Student Readiness Inventory (SRI) to predict the academic success of first semester college students at a mid-sized, southwestern public university.

Purpose of the Study

The purpose of this study guided by Vroom's theoretical framework was to better predict how a first semester college freshman becomes prepared for college. In Vroom's theory, motivation to act is defined as a combination of the perceived attractiveness of future outcomes and the likelihood one's actions will lead to those outcomes (Vroom, 1964). This study identified associations of SAT/ACT assessments of college readiness and high school percentile class rank of first semester college student grade point

average (CGPA), and the ten scales of psychological factors as measured by the SRI. This study explored specific academic and psychosocial characteristics of more than 5000 freshman at a mid-sized, southwestern, public university. As a result of this study, colleges and universities can better predict successful matriculation through the higher education system, and public school educators gain a clearer vision of the knowledge, skills, and characteristics of successful college graduates.

Theoretical Framework

The theoretical framework guiding this study was Vroom's theory of expectancy (1964). In Vroom's theory, motivation to act is defined as a combination of the perceived attractiveness of future outcomes and the likelihood one's actions will lead to those outcomes (Vroom, 1964). Vroom's expectancy theory, which has been tested in industrial settings extensively, shows great promise for being applicable to student satisfaction and motivation, and the related issues of student attrition, and student retention (Lincoln, 1983). Using an instrument designed to predict student satisfaction, motivations and expectancy may provide high schools and college's meaningful predictive factors useful in the preparation and support of students. Correlating student performance on the SRI with the first semester college grade point average (CGPA) may provide insight into the expectancy of potential outcomes of obtaining a college degree.

Research Questions

This study explored specific academic and psychosocial characteristics of more

than 5000 freshman at a mid-size regional university in order to answer the following questions:

- What psychosocial factors identified by the Student Readiness Inventory (SRI) are most relevant in predicting college success?
- What conventional academic indicators are most relevant in predicting college success?

Significance of the Study

The implications of this study are twofold. The results are informative from both a national and state perspective. First, the national perspective will encompass this study's contribution to the overall body of research regarding the prediction of college student academic performance and timely matriculation through the college system. Since the early correlation studies of Klugh and Bierley (1959) and Munday (1965), researchers pursued improved prediction models through the use of theoretical models (Goodman, 1944; Hedges & Majer, 1976; Tinto, 1975). More sophisticated statistical procedures have enabled researchers to test previously untested variables (e.g., personality, demographic, attitudinal). The Student Readiness Inventory (SRI), attempts to identify higher order factors associated with college success. These factors may assist public educators and higher education officials by targeting key areas for intervention to reduce both the academic risk and persistence risk of entering students (Leet al., 2005). This study builds upon that body of research by assessing the predictive potential of the Student Readiness Inventory (SRI) on college academic performance.

At the state level, this study adds significance to the education reforms efforts in Texas designed to significantly impact secondary and post secondary education. Recognizing the importance of a world class education, the 79th Texas Legislature passed House Bill 1(2006), inclusive of the advancement of college readiness outlined in a publication from the Curriculum Education Policy Improvement Council (2009). This legislation required the Texas Education Agency (TEA), and the Texas Higher Education Coordinating Board (THECB) to work in collaboration to develop College and Career Readiness Standards (CCRS). The CCRS are designed to represent a full range of knowledge and skills in the four foundation curriculum areas of language arts, mathematics, science, and social studies that students need to succeed in entry-level colleges courses. A 2005 report from the National Bureau of Economic Research suggests the traditional academic predictors of college success may not provide admissions officers enough information on student make-up as may be required (Bettinger, 2005). This study analyzed the predictive potential of the SRI as an additional analysis of the motivational and resiliency factors enabling students to efficiently matriculate through the higher education system.

The literature is lacking in the area of identifying non-academic factors contributing to college success. Institutions of higher learning traditionally use the psychosocial factors identified by the SRI to assist students in successfully matriculating through the college system. However, there is no evidence these institutions are using the SRI to identify perspective students for admission. Such use may yield a tool to provide opportunity for all to attend college, possibly allowing the college doors to open for underrepresented groups of students.

Delimitations and Limitations

The participants in this research study were limited to first semester college freshman beginning their college course work at a mid-sized, southwestern public university. Many colleges use conventional predictors (ACT scores, SAT scores, and percentile class rank) of college readiness to determine the need for remedial course work among incoming students. In order to demonstrate a correlation between the SRI and student success in college, the sample included only students who met the criteria for college readiness as indicated by the placement of all participants in credit bearing course work during their first year of college. The sample size for this study was (n) 5279. Each participant voluntarily completed the SRI at freshman orientation prior to the first day of college course work.

This study was limited in scope as the sample only included students who met the definition of college ready by being placed in credit bearing course work at their university of choice. This study did not consider any additional academic, social, or emotional support students may have received prior to enrolling in college, attempting college admissions exams, or completing college course work. Students desiring to prepare themselves for the admissions process by voluntarily participating in testing preparation programs demonstrate some level of resiliency and are less at-risk of not completing course requirements. These types of support systems clearly influence college admissions exams, and academic performance (Beck & Davidson, 2001). Undoubtedly, academic preparation for post secondary education leads to successful matriculation through the college system. Strong academic performance and prior

achievement in school are clearly predictive of strong academic performance in college (ACT, 2007b; Adelman, 2006; Campbell, 2005; Conley, 2003).

Assumptions

Participants in this study were limited to those students who are permitted to enroll in credit bearing course work during their first semester at the university. The participants completed the SRI at freshmen orientation seminar prior to the first day of enrollment in credit bearing course work. In order to accurately reflect results of the SRI, the study includes the following assumptions:

1. Each SRI is administered following the procedures and guidelines governing the use of the instrument.
2. Responses received from participants provide accurate, reflective answers to each item.
3. Participants are afforded ample time to be reflective and provide meaningful responses to each item.
4. Participants understand the context of each item.

Definition of Terms

This study refers to specific terms the reader may or may not recognize in this context. For clarity to the reader, the following definitions apply to this study:

1. College Readiness - the level of preparation a student needs in order to enroll and succeed, without remediation, in a credit-bearing general education course

at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program. Earning a 2.5 grade point average in the core classes.

2. Succeed - completing entry-level courses at a level of proficiency and understanding that makes it possible for the student to consider taking the next course in the sequence or the next level of course in that subject area.
3. Persistence - a student's continuing enrollment at the college or university with the goal of matriculating through the system culminating with the completion of a degree or program.
4. Valence - strength of an individual's preference for a particular outcome. The outcome must be desirable.
5. Expectancy - probability or strength of belief that a particular action will lead to a particular first level outcome.

Organization of Study

Chapter 1 provided the reader with the significance, purpose and research question for this proposed study. The remainder of this study is divided into five chapters. Chapter 2 presented a review of the literature related to contributing factors of college readiness. The review of literature was divided into four sections: High School Reform, Development of College Readiness Indicators, Predictors of College Success, and Student Motivation and Engagement. The Predictors of College Success was subdivided into three distinct areas: SAT and ACT Scores, College GPA, and Specific Course Grades. Each of these areas was synthesized to guide the reader through an

understanding of reform efforts, identification of college readiness indicators, predictors for college success, and the development of the SRI.

Chapter 3 delineated the research design and methodology of the study. The study employed a regression model to investigate the variance in first semester college student grade point average (CGPA) using conventional academic predictors and a student questionnaire. This questionnaire, the SRI, measures psychosocial and related academic skill factors found to predict two important college outcomes, academic performance and retention (Le, et al., 2005). This data was presented and analyzed in Chapter 4, inclusive of descriptive tables and interpretations of the results. Chapter 5 contained the discussions, summary, and recommendations for policy or future study, references were also provided.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This review of literature initially guided the reader through several topics related to the definition of college readiness. In order to determine the theoretical framework for establishing a definition of college and college readiness, the literature related to recent high school reform in Texas, the development of college and career readiness standards, studies involving the predictors for college success and student motivation and engagement are examined. Included in the review of college and career readiness standards are studies regarding the predictive nature of Scholastic Aptitude Test (SAT) scores, American College Test (ACT) scores, college grade point average, high school course selection, a brief analysis of admission criteria relating to student achievement and aptitude, and the research based suggestions for developing college readiness standards. In addition, student motivation, engagement, and the non-academic predictors of college success identified by ACT's Student Readiness Inventory (SRI) were thoroughly reviewed to provide useful terminology for college admission considerations and successful matriculation through college.

Significant research contributing to college and career readiness purposely omitted from this review includes analysis of student engagement and identification, the impact of dual enrollment, goal achievement theory, and the impact of external factors such as ethnicity, family background, and economic status have on college readiness and success. All of these topics are contributing factors to college readiness, however in an effort to narrow the focus of this review, research focusing on the development of

college readiness standards and predictors of college success will be synthesized in an effort to identify commonalities and deficiencies in the research, and determine directions for future studies. The literature is lacking in the area of non-academic factors contributing to college success.

High School Reform

One of the most interesting characteristics of education reform, in particular high school reform, is reform efforts are fluid and in constant change. During the twentieth century, the United States has seen many education reform efforts come and go. These efforts are usually the result of some perceived national crisis, such as a war, an economic downturn, or a movement of scientific or technological competitiveness serving as a catalyst for often short lived education “alarm” and reform. Nearly 30 years removed from *A Nation at Risk*, the United States is still gripped by concern for the education system, and desire for global competitiveness (National Association of Secondary School Principals, 2004). Recent reports on student progress towards degree attainment of American students are dim. According to a report from the College Board, the United States has fallen from first to twelfth in the share of adults’ ages 25 to 34 with postsecondary degrees (Lee, 2010). The inability of United States students to keep pace with the academic performance of students from other industrialized countries in the world creates reason for alarm and action.

Policy makers, higher education administrators, public school administrators, and the business community at-large are concerned with the college preparedness of high school graduates. Although two-thirds of recent high school graduates enter college

each year, many of these students are academically unprepared for college-level material(Greene & Winters, 2005). As students recognize the importance of obtaining a college degree, the number of students entering two year or four schools after high school is continuing to rise. However, these students are not matriculating through the higher education system at an adequate pace, leading many people to believe students are not academically prepared for college level work.

Preparation for post secondary success, from an academic standpoint, may require students to access rigorous content. Upper level math and science courses, and challenging curriculum have long been preparatory requirements for college success (Conley, 2003). In an effort to provide access to rigorous coursework, many school systems have opened enrollment to Advanced Placement (AP), International Baccalaureate (IB), and dual-credit courses to non-traditional students. Support for these students is often difficult due to the lack of academic preparation at the lower grade levels. Many times, these students are not prepared academically or socially for such rigor. Some school systems have offered additional support at the secondary school level by providing programs such as Advancement Via Individual Determination (AVID) to support students without the academic background to be successful in this rigorous course work (Hoffman, Vargas, & Santos, 2009). However, in trying economic times, such programs are subject to budget casualty.

Access to this rigor has created a positive academic effect as the national average student performance on conventional exams used for college admissions has increased. The national average score on the ACT continues to rise, and the number of students taking these exams has simultaneously risen (ACT, 2008). The increase in

student performance on these exams may demonstrate an increase in academic prowess of American students; however, the number of students requiring remedial courses upon entering college continues to rise exponentially. A report provided by Greene and Forster (2003) found 32% of all high school graduates are actually prepared for college level work. Another report by the ACT found only one in four ACT-tested 2007 high school graduates are prepared for entry-level college courses in the all four core areas of English composition, algebra, social science, and biology (ACT, 2008). The cost for remediation is estimated at \$1 billion or more nationally at public colleges alone (Breneman, 1998). As student performance on these conventional measures increase and these same students are being placed in non-credit bearing classes, the predictive validity of such assessments comes into question.

Policy makers at both the national and state level are looking for other ways to address academic preparation of students. At the national level, the National Governors Association Center for Best Practice (NGA Center) and the Council of Chief State School Officers (CSSO) released a set of state led education standards known as the common core state standards (CCSS) (Pascopella, 2010). Many states have signed on to these standards, however for various reasons; other states have yet to do so. As of August 2010, just over half of the states in the United States had adopted the standards (Pascopella, 2010). These CCSS were developed to provide a consistent, clear understanding of what students are expected to learn, so teachers and parents would have a road map to assist students with their learning.

In Texas, policy makers continue to explore methods to improve the preparation of Texas high school students. The 78th Legislative Session (2003) marked the

beginning of an era that has focused intensively on improving public high school education. Mahoney, Lain, & Clark (2009) reports many initiatives evolving from this legislation, including, the Texas High School Project (2003), P-16 Councils (2003), Early College High Schools (2003, 2006), Vertical Teams (2006), “4X4” (2006), College Placement Exams (2006), establishment of the high school allotment (2006), and the establishment of the Commission for a College Ready Texas (2007).

One early outcome of this legislation is a movement towards accessing college level courses at an earlier age. The establishment of early college high schools and increased student access to dual-credit course offerings are one such indication. The formation of the P-16 councils has created opportunities for K-12 educators and higher education officials to dialogue about college and career readiness standards (CCRS). Accesses to such courses are often not dependent to ACT/SAT performance, or other academic indicators. In fact many students are provided access to these initiatives in spite of past academic performance. Early results indicate students are just as successful as their more academically prepared counterparts for reason other than academic preparation (Mahoney et al., 2009). Since these students are just as successful as their counterparts, further investigation into other non-academic factors contributing to college readiness is necessary.

Students having access to and enrolling in post secondary education is only part of the puzzle. It is also important for students to matriculate through the system in a timely manner. Enrolling in college should not be the climax of a student’s educational career, however successful matriculation to a college degree may very well be the desired outcome. Research has identified three indicators of degree attainment: (a)

entering a postsecondary institution directly from high school, (b) earning twenty or more credits in the first year of enrollment, and (c) performing well enough in that first calendar year to fall in the top 40% of a GPA distribution were found to be statistically significant predictors of college completion (Adelman, 2006). As a result some officials are implementing non-traditional admissions criteria, allowing students earlier access to this course work. Such access provides an effective transition from high school to college, an increase in student confidence, and an increase in student expectancy (Cabrera, Deil-Amen, Prabhu, Terenzinie, Chul & Franklin, 2006). These efforts are validated in another study in which Dougherty, Mellor, Smith, (2006) summarized the importance of an early start at credit attainment. An early start makes it possible to reach high standards in one subject area while maintaining sufficient learning time and a balanced curriculum in other subject areas. Early access to college has proven to be a key component rising from the reform initiatives of the 78th Legislature, as a majority of reform models on high school education focus on the larger curricular and policy issues associated with integrating Grades 9-14 (Conley, 2007a). In summary, student access to rigorous content at an early age has proven to be instrumental in successful matriculation towards a college degree. However, the research also suggests access to rigorous coursework may not be enough. Our schools may need to explore other measures predictive of college success.

Development of College and Career Readiness Indicators

State and federal governments have launched an ambitious, unprecedented attempt to specify and measure student learning in public schools (Conley, 2003). Each

state in the United States is specifying what students should know, how they should be assessed along with the components required to graduate from high school (Guerra, 2009). State education agencies and local education agencies are responsible for curriculum standards, assessment standards, and graduation requirements. These variations in standards and requirements across the United States from a national perspective, and across Texas from a state perspective place institutions of higher education in a dilemma for determining admissions into their institutions. As a result, many researchers (ACT 2006, 2007a; Adelman, 2006; Brown & Conley, 2007; EPIC 2009; Geiser & Studley 2002) are working to determine the predictors and standards for college and career readiness. Although the development of college and career readiness standards is relatively new terminology, institutions of higher education have traditionally held to admissions standards (Horn, 2005). The definition of “readiness for college”, and items to look for when reviewing applicants for admission is the question posed in numerous studies focusing on college and career readiness (Brown & Conley, 2007; Conley, 2005; Geiser, 2009).

Research findings regarding readiness for and success in college are plentiful and stress the importance of rigorous course work. The definition of rigor has been at a minimum elusive. Numerous studies (ACT 2006, 2007a; Adelman, 2006) have focused on defining rigor and the connection rigor has with success in college. Specifically, a report from the American College Testing outlines the recommended courses students should take to be deemed rigorous, and the vertical alignment within each (ACT, 2006, 2007a). Using data from the National Education Longitudinal Study of 1988, Adelman (2006) examines the rigorous factors leading to attainment of a bachelor’s degree.

Adelman found students who complete 3.75 Carnegie units of English and math, with the highest mathematics being calculus, pre-calculus or trigonometry, 2.5 Carnegie units of science including lab science (biology, chemistry, and physics), more than 2 Carnegie units of foreign language, more than 2 Carnegie units of history and social studies, 1 or more Carnegie units of computer science, more than one Advanced Placement course, no remedial English, and no remedial mathematics courses had a 95 percent chance of completing their college degree (Adelman, 2006). Results of Adelman's study are consistent with the 2007 study conducted by the ACT, which found at a minimum rigorous high school graduation requirements should include four years of English, at least three years of math including rigorous courses in algebra I, geometry, and algebra II, three years of science, including rigorous courses in biology, chemistry, and physics, and three years of social studies (ACT, 2007a). Furthermore, a policy brief released by the Pathways to College Network (2007), emphasized the importance of providing students with a rigorous curriculum in preparation for more advanced course work.

According to the Pathways College Network, a well-designed, coherent, and rigorous curriculum allows all students to achieve mastery of core academic skills and opens the doors to both college participation and skilled workforce employment (Network, 2007). However, Rainwater, Mize, and Brooks (2008) assert that a rigorous education is not measured simply by the number of courses taken, or grades earned, but by the extent to which these courses actually prepare students for the world of work and college (Rainwater et al. 2008). Rainwater et al. go on to identify the need to define rigor, develop a rigorous standard for all students, create state policy that specifically

supports rigor along with externally validated assessments, and provide teachers and administrators with the professional development opportunities related to curriculum, standards, and assessments. These studies provide sound research based support for the change in graduation requirements for Texas public school students, especially in the areas of math and science, where Texas students are required to successfully complete four years of math and science to graduate from high school (Mahoney et al. 2009).

The aforementioned studies stress the importance of accessing rigorous course work for college success, In order to determine if access to rigorous coursework is resulting in a more college ready student, student knowledge must be measureable. Over most of the last century, there have been two schools of thought regarding the utilization of achievement tests and aptitude test utilization as a determining factor for college readiness (Atkinson, 2001, Geiser, 2009). The traditional view has emphasized achievement as demonstrated by students' high school grades or grade point average (GPA) in academic subjects. This view reflects a reward and incentive philosophy in which admissions to college is the reward for hard work and achievement in high school (Geiser, 2009). Additionally, this view encourages schools to offer, and students to take a rigorous college preparatory curriculum, an important component to college success. Students choosing to access rigorous curriculum tend to do well in college, providing the curriculum was actually rigorous (Campbell, 2005). The alternate view is that students should be judged not simply on what they have learned, but their ability to learn. Aptitude test such as the SAT and ACT have a historical tie to the concept of innate mental abilities and the belief that such abilities can be defined and meaningfully

measured (Atkinson, 2001). Every year, more than a million high school students stake their future on the nation's most commonly used admission test as the global standard for ensuring student quality (Atkinson, 2001). The idea that students can and should be judged on ability is closely associated with the SAT and ACT has captivated American college admissions since the test was first introduced (Geiser, 2009). The utilization of such an assessment is understandable in providing a selection criterion for institutions of higher education.

However, recent research is questioning the validity of SAT as a predictor to college success. Geiser and Studley (2002) report the SAT is a relatively poor predictor of student performance. Admission criteria that require mastery of curriculum content, such as high school grades, and achievement tests are more valid indicators of how students are likely to perform in college. The researchers' further surmise the SAT as an admission criterion has a more adverse impact on poor and minority applicants than do high-school grades, class rank, and academic achievement. It is more important to consider student achievement indicators of minority students in rigorous coursework rather than the measurement of aptitude or academic potential of disadvantaged students.

The literature focused on achievement tests versus aptitude tests strongly suggests reconsideration of any aptitude test as it relates to college readiness. Student achievement over time has proven to be a primary and successful predictor of college success. In fact, high school grades were the strongest predictor of college success (Atkinson, 2001; Geiser, & Studley, 2002). The shift towards an achievement rather than an aptitude has led to a change to the assessment system in the State of Texas.

Legislators in Texas are striving to anchor assessment of college and career readiness standards (CCRS) into all state assessments by the spring of 2012. In a 2007 study by Brown and Conley, researchers worked to determine the congruence between the content of state high school assessments and a set of standards and objectives keyed to the knowledge and skills necessary for success in select American research universities. The result of the study indicate that state high school assessments and the knowledge and skills necessary for college readiness align in areas that might be characterized as more basic and do not align as well in areas requiring more sophisticated cognitive functioning. The conclusion is that high school exams cover only a portion of what is necessary for college success (Brown & Conley, 2007). This study reaffirms a commonsense conclusion that some reasonable degree of alignment already exists between a high school education and a least a subset of college readiness skills, however the degree of alignment is not enough to predict student success in college. To increase the degree of alignment in Texas public high schools, state assessment exams are transitioning from the current Texas Assessment of Knowledge and Skills (TAKS), to a more specific end of course assessment inclusive of recently adopted college and career readiness indicators (Conley, 2005; Guerra, 2009).

Aligning state assessment systems to rigorous curriculum is fundamental to creating high school graduates who are prepared for post-secondary. It is essential to begin meaningful K-16 vertical alignment in academic course work and curriculum to ensure students who completed grade-level work are prepared to advance and succeed in college (ACT, 2006; Brown & Conley, 2007; Conley, 2005). In order for public high

schools and higher education institutions to collaborate on such a complex issue, vertical alignment discussions are a necessity (Conley, 2003).

Another concern for public school educators and admissions officers is a common vocabulary relating to college and career readiness, and the assessments or indicators determining such readiness (Campbell, 2005). In 2007, Texas established vertical teams as a measure to meet the requirements of House Bill 1, the Advancement of College Readiness in the Curriculum to write and draft College and Career Readiness Standards (CCRS). The vertical teams set out to specify the knowledge and skills necessary to succeed in entry-level community college and university courses (Education Policy Improvement Council, 2009). The goal of the Texas CCRS is to establish what students must know and be able to do to succeed in entry level courses offered at institutions of higher learning, and these levels are organized into four areas: key content, organizing components, performance expectations, and performance indicators (EPIC, 2009).

The development of the CCRS in Texas is a result of House Bill 1 of the 79th Legislature Third Called Special Session. The CCRS are in symmetry with the research recommendations discovered in this review (ACT, 2006; Brown & Conley, 2007; Conley, 2005, 2007). However, the standards for CCRS have yet to be articulated into the high school curriculum, and the results of the implementation of the standards are in need of study. In order to truly measure the impact of the CCRS, a correlation study of college entrance or placement exams to the standards outlined in the Texas CCRS is needed. Results of Conley's correlation study of CCRS to conventional measures used at colleges and universities such as SAT, ACT, Texas Higher Education Assessment

(THEA), TAKS, Compass, Odyssey, or any other measure used by higher education to determine college readiness or placement were unavailable upon submission of this review. However, the results of the correlation study will assist public school educators and higher education officials in determining the validity of the CCRS standards established by the vertical teams, and measured by end of course exams.

The Predictors of College Success

As addressed in the previous sections, the predictors of college success have remained somewhat a mystery. This section of the review will explore research in three conventional predictors of college success, SAT and ACT scores, grade point average, and specific course grades.

SAT and ACT Scores

Researchers debate the appropriateness of college admission requirements for ACT and SAT scores. Crouse and Trusheim (1991) accepted two conclusions supported by numerous SAT validity studies: (a) addition of the SAT to the high school grade performance improves a colleges' best estimate of students' academic performance and (b) prediction equations containing SAT scores and high school grade performance yield high correlations between predicted grades in college and actual grades actual grades in college. These two conclusions alone do not constitute a basis by which a student should be identified as college ready, however many institutions base their admissions on such criteria. Crouse and Trusheim (1991) argued the focal decision point for including SAT scores in admissions should be the SAT's utility.

However, as more and more students are sitting for the exam, performing better and entering institutions of higher learning, other utilities need be explored.

A similar controversy surrounds the use of ACT scores. Gordon (1974) explored the correlation between SAT and ACT scores. The study compared ACT-English to SAT-Verbal and ACT-Mathematics to SAT-Mathematics. This effort, computing correlations between the two most commonly used aptitude measures, contained potential utility for admissions personnel at universities accepting both tests. The high correlation between ACT and SAT scores and the resultant linear regression equations, provided for the continued comparative use of the scores in college admissions. Yet, something was missing. Both assessments are based solely on academic prowess, and many students who meet the criteria for admissions do not successfully matriculate through the system to degree attainment.

Lenning and Maxey (1973) compared the predictive efficiency of the SAT and the ACT on college freshman grades. The research gathered data from the ACT Standard Research Service files for the previous three years and identified 17 postsecondary institutions appropriate for the study's purpose. The institutions varied in main admission test used (SAT, ACT, or either). Correlation comparisons within the 17 schools in the sample indicated the ACT predicted college GPA (CGPA) as well as, and consistently better than, the SAT. In addition to this research on the comparative validity of conventional aptitude scores, a decline in validity was the focus of several subsequent studies.

Dalton (1976), replicating a longitudinal study at the University of Southern California (USC), tested the predictive validity of the SAT and high school achievement

over time on college freshman grades. The USC study reported a decline in the predictive validity. The continuous independent variables used by Dalton were SAT-Total score and high school percentile rank (HSR). The dependent variable was first semester college GPA. Dalton performed a multiple regression model by gender for each year group. The predictive validity of the SAT and HSR declined over time for both males and females. Dalton's (1976) results mirrored those reported in the USC study, providing evidence for a trend in lower predictive validities for SAT scores and high school achievement data.

Investigating a decreasing correlation of SAT scores to first year college grades, Wainer, Saka, and Donoghue (1993) focused their research on the University of Hawaii-Manoa ((UH). Since 1982, the correlation of Hawaiian students' SAT scores to first year grades dropped to nearly zero. The independent variables, measured were SAT-Verbal (SAT-V) score, SAT-Mathematics (SAT-M) score, SAT-Total score, and high school grade point average (HSGPA). The dependent variable was first-year college grades (FYG). The researchers analyzed data using zero-ordered correlations, comparing 1989 data with the 1982 data and national SAT statistics. Data from 1989 students from Hawaiian secondary schools yielded correlations between FYG and SAT-V, SAT-M, and HSGPA, lower than those for their 1982 cohort. The predictive validity of SAT and FYG decreased during a time of increased academic preparation of students. Wainer, Saka, and Donoghue considered a variety of other possible explanations for a loss of SAT validity for Hawaiian educated freshman, such as Hawaii's unique status among the 50 states or unusual freshman course selection, but reached no satisfactory explanation.

In summary, a convergence of two issues has created a controversy surrounding the continued use of SAT and ACT scores for college admissions. The first issue related to an overall drop in predictive validity of conventional aptitude and ability test measures (SAT and ACT) on college GPA. The second focused on the potential bias and differential validity of the SAT and ACT tests in regards to race, gender, and geographic location (Dalton, 1976). If the predictive validity, utility, and fairness of these two tests were suspect then there may be better predictors available for admission decision making. The prediction of academic performance in college is a dynamic endeavor. As students, society and institutions change, the equations and processes admission offices use must change (Stern & Briggs, 2001). K-12 educators are experiencing increasing pressures to better prepare students for college work, just as post secondary institutions experience pressures to respond to changing conditions in their recruitment, selection, and development of students. First semester college GPA is the first indicator of a students' progress in successful matriculation towards degree completion, and it is the first indicator for students to demonstrate college readiness. Grade prediction, whether focused on the first quarter, semester, year, or cumulatively, is of interest and concern to public educators, university admissions officers, and faculty alike.

College GPA

The prediction of college grade point average (GPA) grew in importance when postsecondary education grew in the 1950s and 1960s and institutions received far more applications for admission than available openings (Lavin, 1965). University

administrators needed tools to aid in the selections of their student bodies from the applicant pool. Prediction equations helped satisfy that requirement.

Research on the prediction of college GPA significantly expanded in the post-World War II era with an emphasis on conventional predictor variables such as high school GPA (Hillis, 1964), high school class rank (McDonald & McPherson, 1975), and aptitude test scores (Noble & Sawyer 1989; Nisbet, Ruble, & Schurr, 1982). To some extent, researchers also included nonacademic variables such as personality measures (Himmelstein, 1965), attitudinal factors (Wesley, 1994), and demographic information (Misanchuk, 1977) to account for additional variance in college GPA. The criterion for research studies was either short term GPA (Klugh & Bierley, 1959) or long term cumulative GPA (Wolfe & Johnson, 1995). This section's review of GPA predictors includes subsections addressing the prediction of specific course grades, first semester GPA, first year GPA, cumulative GPA, and the use of high school record as a source of additional predictive power.

Specific Course Grades

Noble and Sawyer (1989) examined the validity of ACT scores and self-reported high school grades to predict performance in 12 types of English and mathematics freshman college courses. The researchers' analyzed data from 233 of the 277 institutions that participated in the American College Testing Program's predictive research service between 1980 and 1984. Data collection included student data from the ACT predictive research service and course descriptions from institution questionnaires and catalogs.

The predictor variables included the four ACT test scores and self-reported high school grades in the four ACT test subject areas (English, mathematics, social studies, and natural science). The criterion variables were specific course grades in one of 12 types of freshman English and mathematics courses. Noble and Sawyer used three combinations of predictor variables (ACT test scores, high school grades, and ACT test scores combined with high school grades) in their multiple regression analysis. Their results indicated the combined model was a significantly ($p < .01$) better predictor of college grades than ACT scores alone. ACT scores were better predictors than self-reported high school grades. ACT scores and high school grades, in addition to their traditional use as college GPA predictors, held predictive validity for specific college course grades.

Responding to the relative unpredictability and unexplained variance associated with college grade point average (CGPA), Goldman and Slaughter (1976) selected a criterion similar to that of Noble and Sawyer (1989): individual course grades. The theoretical basis for this investigation was CGPA's composite nature of averaged grades from a variety of courses in specific disciplines with unique grading systems and heterogeneous student pools. Single course grades contained fewer opportunities for introduced ambiguity and variance. The continuous predictor variables were SAT-Verbal (SAT-V), SAT-mathematics (SAT-M), and high school GPA (HSGPA). The criterion measures were specific grades in one course. The researchers computed correlations and multiple regressions for each class. These results supported the researchers' hypothesis that the validity concerns regarding conventional college success predictors,

such as SAT, should focus on removing variability from the criterion measure, college GPA.

Norton-Welsh and Reding (1992) went beyond this consideration of a single course grade to examine the predictability of college GPA in a grouping of similar courses. Norton-Welsh and Reding studied the relationships between selected variables and successful performance in an accounting program. The researchers defined success more broadly than in past studies, by including all of the grades from all seven required accounting courses taken during the junior and senior years. Five predictor variables included three interval-level predictors and two nominal level predictors: (a) American College Test (ACT) score, (b) College GPA in freshman and sophomore business tool courses, (c) score on the Admission Qualifying Examination (AQE), (d) gender, and (e) accession status (native or transfer). Two dependent variables, both intervals, were examined separately. The first of the dependent variables, criterion was college GPA (AVG-1) in three intermediate accounting courses most frequently completed in the junior year. The second dependent variable was college GPA (AVG-2) in all seven accounting courses most students complete within two years of acceptance into the program.

Norton-Welsh and Reding (1992) provided both criterion measure (AVG-1 and AVG-2) to be paired with each cohort group (1987 and 1988) in four multiple linear regression analyses. Only students with passing grades in all seven classes were entered into the equation. AQE, GPA, and ACT best predicted AVG-1 and AVG-2 for the 1987 group. GPA and AQE best predicted AVG-1 and AVG-2 for the 1988 group. Prediction improved slightly for seven courses from three. College GPA for both year

groups accounted for greater variance when predicting GPA for seven courses. Sex and accession status (native or transfer) did not contribute to the equation. ACT added little to the 1987 year group's regression models for AVG-1 and AVG-2 (Norton-Welsh and Reding, 1992)

Misanchuk (1977) challenged the traditional multiple regression approach to predicting academic achievement by incorporating Atkinson's model of the dynamics of cumulative achievement using discriminate analysis techniques. The researcher developed instruments to collect data on cumulative achievement to differentiate and predict scholastic success in a university course. Participants were students enrolled in one of three courses (freshman geography, freshman chemistry, or introductory economics) at a large mid-western university. This study generated 17 standardized discriminate function coefficients. The survey contained 58 items divided into the following composite subscales: (a) fear of failure; (b) daydreaming relating to achievement motivation; (c) locus of control; (d) academic values, (e) incentives to achieve in the course; (f) level of performance while at work; (g) amount of time spent at work; and (h) motivation for alternatives. The remaining coefficients were gender, SAT score, day dreaming relating to achievement motivation, fear of failure, efficiency ratio (level of performance while at work/SAT), interaction of level of performance and the amount of time spent at work, strength of motivation for the task, and two distracter variables (nature of the Task 1, and nature of the Task 2). The survey contained 15 9-point Likert-type scales, 31 5-point Likert-type scales, and 12 forced choice responses.

Misanchuk (1977) withheld a cross validation group from the original calculation and computed a step-wise discriminate analysis. Two of the three discriminate functions

were significant at the .001 level. The number of correct classifications, those exact or within two standard deviations, in the cross-validation group was 57.3%. If interpreted in the context of minimizing cost and maximizing efficiencies, where under predicting grades and supplying unnecessary remediation is preferable to over predicting grades and overlooking remediation for a poor student, a prediction rate of 77.1% was reported. Misanchuk's application of Atkinson's cumulative achievement model indicated discriminate analysis significantly predicted achievement in one course.

Student Motivation and Engagement

As noted earlier in Chapter 2, attention is being paid to the importance of curriculum alignment in the transition from the ninth grade in high school through the first two years of college, and the however it is equally important to understand the experience of students participating in such curricular restructuring efforts (Nakkula & Foster, 2007). Student motivation has long been considered an important factor in the determination of academic performance. The philosophy of many educators is that all students can learn. When translated into instructional activities and learning strategies, teachers, like managers, must know what motivates people (Oliver, 1995). An understanding of and a relationship between motivation and performance has been explored in many ways, and by numerous researchers. One perspective is the expectancy theory, as developed by Vroom (1964). According to this theory, motivation to act is a combination of the perceived attractiveness of future outcomes and the likelihood one's actions will lead to those outcomes. Vroom's expectancy theory, which has been tested in industrial settings extensively, shows great promise for being

applicable to student satisfaction and motivation, and the related issues of student attrition, and student retention (Lincoln, 1983).

In an educational setting, motivating students to put forth academic effort depends on students' perceptions of the benefit of academic performance and their belief that exerting effort will actually lead to higher performance (Geiger & Cooper, 1995). The advantage of this theory is that it focuses attention on the motivation and behavior of the student. It values a student's time and commitment to learning. The effectiveness of any educational policy or practice is directly related to its capacity of increasing student involvement (Geiger, Cooper, Hussain, O'Connell, Power, & Raghundandan, 1998). The more effort expended by a student, the greater the learning and personal development, thus the greater the student performance and student satisfaction. To assume a student would successfully matriculate through a rigorous, difficult, college preparation program without a self realization of the benefit of the outcome is nonsensical.

A college degree has replaced the high school diploma as a mainstay for economic self-sufficiency and responsible citizenship (Kuh et al. 2008). Earning a bachelor's degree is linked to long term economic benefits to students. These benefits are passed on to future generations, enhancing their quality of life of families of college educated parents and providing the outcome expectancy theorized by Vroom (1964). The difficulty lies not only in communicating that long term benefit to the late adolescent learner, but also developing and using an instrument to predict college success is a benefit to students and postsecondary institutions alike. Early academic planning regarding early college high schools, access to rigorous course work, student relevant

curriculum decisions, and an early transition to a post secondary culture may in fact provide the student satisfaction and motivation necessary for students to graduate from high school ready for college and successfully matriculate through the college system. However, a method to measure such satisfaction and motivation would be invaluable.

Noticing a substantial void in the ability to measure such factors to predict college success, Robbins et al began the work to develop such an instrument. The framework for development was provided by Covington (2000) and Eccles, Wigfield, Neil, & (2001) who provide comprehensive reviews of the motivation theories that relate to students' college success. Within these reviews, theories can be categorized into two groups: achievement-as-drive and achievement-as-goal theories (Covington, 2000). The key construct for the achievement-as-drive or achievement drive theory is summarized in Robbins et al. (2004) meta-analysis. His work surmised that this construct is predictive of college students' academic success above and beyond the academic indicators of SAT, ACT, GPA, etc. Expectancy-values theory (Eccles, Wigfield, Neil, & Paul, 2001) places emphasis on the attainable result. Both of these theoretical constructs were examined in Robin's et al. (2004) meta-analysis as academic self-efficacy and academic goals. Both were found to be predictors for college outcome criteria. Robbins, et al. (2004) included both models in the development the Student Readiness Inventory (SRI), an instrument measuring the psychosocial and academic-related skill factors found to predict two important college outcomes, academic performance and retention.

Student Readiness Inventory

On the basis of 109 studies, Robbins et al. (2004) identified and studied nine broad constructs derived from educational persistence and motivational models of college success: achievement motivation, academic goals, institutional commitment, perceived social support, social involvement, academic self-efficacy, general self-concept, academic related skills and contextual influences. Robbins and his team of researchers controlled for conventional predictors of college success (i.e. high school GPA, ACT, SAT, and socioeconomic status). They then identified three psychosocial constructs that demonstrated incremental validity in predicting academic performance. Additionally, six constructs were found to be predictive of the successful matriculation to timely degree attainment (Le, et al., 2005). Robbins et al. (2004) proposed that the composite of psychosocial and academic related predictors was best understood by three higher order constructs: motivation, academic related skills, and social engagement. Robbins et al.'s meta-analysis of 109 studies provides a unified framework for guiding the development of a comprehensive psychosocial and skills inventory for predicting college success.

The self-regulated model (Schunk, 2000, Schunk & Zimmerman, 2003) combines the motivational constructs (e.g., goals, self-efficacy, and self esteem) with cognitive skills (e.g., self regulated learning strategies, including motivational and behavioral strategies), to explain the process determining students' performance in college. Both of these constructs were included in Robbins et al.'s 2004 meta-analysis, and both were included in the development of the SRI.

A study conducted by Pintrich (2000) also integrated motivational constructs derived from expectancy-value and goal theories. In addition, Pintrich included cognitive constructs to predict students' academic performance. Pintrich identified an affective construct, test anxiety, which was not included in Robbins et al.'s meta-analysis. According to this model, test anxiety is an important predictor of student's academic performance. Although not included in Robbins's et al. meta-analysis, test anxiety is a construct included in the development of the SRI (Le, et al. 2005).

Tinto (1975, 1993) and Bean (1985) proposed two models in the educational literature predicting successful matriculation towards timely completion of a college degree. As shown by Robbins et al. (2004), these models have several common elements: contextual influence, ways an institution may be likely to affect college outcomes; perceived social support, social involvement, and academic engagement, which includes the commitment to obtain a degree (Bean, 1985; Tinto, 1975, 1993). Because of their roles in the educational literature, both models have been well researched. The constructs from these models were also examined in Robbins et al.'s 2004 meta-analysis. Specifically, the area of social support, social involvement, and institutional commitment factors were found to be predictive of the college readiness criterion and were included by Le et al. (2005) in the development of the SRI.

The utilization of the SRI as a predictive instrument of student success in college will identify specific student strengths contributing to college success. In addition, the SRI will assist students in improving weak areas in an effort to increase student GPA and make successful degree attainment a reality. K-12 Educators can address student

weak areas by analyzing groups of students from their perspective districts for special programming, goal setting, or organizational initiatives.

Chapter Summary

In summary, the validities of key constructs under the prevalent motivational theories were appropriately covered in Robbins et al.'s 2004 meta-analysis. Connections of this meta-analysis are made to the motivational theories of Eccles et al 2001 provide the framework to use the SRI as a construct to explore Vroom's (1964) expectancy theory correlating to college readiness.

Just as literature focusing on high school reform is broad, complex, and vast, the same holds true for theoretical constructs to student motivation. Additional work of self-regulated learning models (Schunk, 2000), goal theory (Pintrich, 2000), and the educational persistence models proposed by Bean (1985) and Tinto (1975) provide a vast theoretical framework contributing to the success of students in college. The literature is lacking in studies investigating the predictive nature of the Writhe predictive nature of the SRI may provide admissions officer's additional information to select the most capable students for their institutions and a baseline for support students may need to matriculate through the system. The existing literature is lacking in effective strategies, programs, or initiatives building student capacity in the areas of motivation and expectancy measured by the SRI. More importantly, an analysis of student psychosocial factors gleaned from the SRI and student outcome performance during the first year of college will suggest to public school educators the student psychosocial factors indicative of college success. Once these factors are identified,

recommendations can be made to public school educators regarding methods to increase the psychosocial capacity of their students and graduates.

CHAPTER 3

METHODOLOGY

Introduction

This chapter explained the methods used to carry out the study, giving special attention to the analysis of data. The purpose of this study was to investigate variables for predictive power in regards to college student academic performance as measured by their first semester college grade point average (CGPA). This quantitative study utilized a multiple regression model to investigate the variance in first semester college student grade point average (CGPA) using conventional academic predictors of college readiness and a student questionnaire, the Student Readiness Inventory (SRI). The Student Readiness Inventory (SRI), developed by ACT, measured psychosocial and related academic skill factors found to predict two important college outcomes, academic performance and retention. This study focused on the first of these outcomes, academic performance. This chapter addresses the methodology selected to address the research question listed in chapter and includes a description of the design, population, sample, instruments, and regression analysis to be used to assess the data.

Research Design

This study explored associations of SAT/ACT assessments of college readiness, high school percentile class rank of first semester college student GPA, and the ten scales of psychological factors as measured by the SRI. This study explored specific academic and psychosocial characteristics of more than 5000 freshman at a mid-sized, southwestern, public university over a two year period. Multiple regression techniques

were used to analyze the data in an effort to predict college readiness on factors other than academic performance. An advantage of the multiple regression analysis is it allows specificity to a fixed order of entry for variables in order to control for the effects of covariates or to test the effects of certain predictors independent of the influence of each other. In this study, I determined the relevancy of conventional academic indicators and psychosocial factors in predicting college success. From a practical standpoint, this study sought to identify the predictors of college success allowing for the development of curriculum models designed to enhance psychosocial skills, and provide admissions officers with an additional consideration when identifying perspective students as college ready.

A disadvantage of regression analysis is that researchers may be inclined or tempted to assess all possible variables at once in sort of a “shotgun approach.” According to some authors, this may lead to significant findings that are caused purely by spurious correlations, rather than a logical or theoretical rational (Gall, Borg, & Gall, 1996). Another disadvantage of correlation research is the greater the number of correlations assessed, or in this study, the number of predictor variables used, the more complex the interpretations become. Yet another disadvantage of correlation designed is they cannot establish cause and effect relationships.

The Student Readiness Inventory (SRI), a student questionnaire, was used to gather necessary psychosocial data. Questionnaires allow researchers to cover a large area or population at a minimal cost. In this case, the questionnaire is given to all incoming freshman at university orientation. Specifically responses from this questionnaire were analyzed from two consecutive freshmen classes, the class of 2009

and the class of 2010 at the University of North Texas. The questionnaire was quick and easy to complete, and the data was gathered and analyzed much more efficiently than is the case with interviews. Often, questionnaires provide the respondents with some level of anonymity because the researcher and the respondent may never see each other. In such cases, respondents may be more truthful than they would be in a face-to-face encounter (Leedy & Ormond, 2001).

Using a questionnaire may also have some disadvantages. Answers to the questionnaire are a self analysis, and responses need to be treated as such. Respondents may experience phenomena known as the halo effect; in which respondents attempt to rate themselves to an acceptable or higher level in order to meet what they perceive is the desired outcome (Alfone, 1997). Another disadvantage of questionnaires is the items can be misunderstood or misinterpreted by the respondents.

Population and Sample

The population selected for this study included more than 5000 freshman at a mid-sized, southwestern, public university over a two year period. Data was gathered from the university regarding the historical academic indicators used in the admissions process and student responses to the SRI.

Demographic, academic, admissions and SRI data was collected from all incoming freshman students. The population includes students deemed college ready by the standards established by the university. This is an important point because this study is interested in the psychosocial factors predicting success in college as

measured by the first semester college grade point average. Many students do not successfully matriculate to degree completion even though these students have been accepted to the university based upon the admissions criteria established by the institution. Traditionally, admission criteria are primarily centered on the academic history of prospective students. Limiting the population to students deemed college ready, this study allowed for analysis of the psychosocial factors predicting college success.

The sample size for the study was (n) 5279. This study employed a stratified sampling approach, selecting independent samples from a group within the population. The stratified group will be the students meeting the definition of college ready by the institution. Each participant voluntarily completed the SRI at freshman orientation prior to the first day of college course work. Rather than exclude all subjects not exhibiting all three variables: SAT/ACT scores, high school percentile class rank, and SRI results, this study utilized the concordance table to extrapolate ACT scores from SAT performance. Concordant scores are defined as those having the same percentile rank with respect to the group of students used in the study. The tables are useful for determining the cutoff score on one test that results in approximately the same proportions of students selected by the other test, although not necessarily the same students. The table shows, for example, that an ACT Composite score of 20 has a concordant SAT CR+M score of 950; these scores would typically result in selecting approximately the same proportion of students. Use of the concordant score is a valid technique since the purposes of this study area to analyze the predictive variable of a

college ready student and the sample included only students determined to be college ready by the university.

In correlation studies, tradition suggests a minimum sample size of 30 subjects be used to approximate normal distribution (Gall et al.1996). Statistical methods outlined in Hinkle, Wiersma, and Jurs (1998) can be used to approximate a more precise sample size. At alpha of .05, a 4:1 ratio of alpha to beta (beta=.20) results in a statistical power of .80. By varying the standardized effect size between small, medium, and large, more specific sample sizes can be determined.

Hair, Anderson, Tatham and Black (1998) provide a general rule for the minimum number of observations per predictor variable, which is 1:5. However, Pedhazer(1997), Gall et al. (1996), and Stevens (2002) suggested ratios of predictor variables to sample size from 1:15 to 1:30. Because this study will use 13 predictor variables, a sample size greater than 260 is suggested for a traditional multiple regression. The minimum sample size for the discriminate analysis is 260. This study targets a sample of more than 5000.

Variables

The independent variables of interest include high school percentile class rank, composite ACT, composite SAT, and the 10 themes measured by the Student Readiness Inventory (SRI). The ten themes of the SRI are academic discipline, general determination, goal striving, commitment to college, study skills, communication, social connection, social activity, academic self-confidence, and steadiness. The dependent variable of interest will be the first semester college GPA of each participant.

Instrumentation

Student Readiness Inventory

The Student Readiness Inventory (SRI) is a measure of psychosocial and academic related factors (PSF), found in a meta-analysis to be predictive of academic performance (Robbins et al., 2004). The SRI is composed of 10 scales that measure a range of academic related constructs. Research found that SRI constructs were relatively independent of standardized test scores (Robbins, Allen, Casillas, Peterson, & Le, 2006), and may offer a viable alternative to forecasting academic performance.

The SRI is a 108 item inventory comparing 10 scales measuring students' academic-related personality facets and skills. The inventory was designed to assist post-secondary institutions in identifying and intervening with students at risk for drop out or poor performance. Items are scored using a 6-point, Likert scale that ranges from *strongly agree* to *strongly disagree*. Scales range from 10 to 12 items and have demonstrated moderate to high internal consistency reliabilities (alpha range = .81 to .87; median = .84), as well as incremental validity over demographic, instructional, and standardized achievement variables (Le et al., 2005; Robbins et al., 2006)

Data Collection

Archival data from office of Institutional Research and Effectiveness at the University of North Texas was collected for this study. Data collection involved queries from their perspective databases and records. The institution assigned student identification numbers used to collect all data and maintain the confidentiality of all subjects.

The data analysis for the present study included descriptive statistics and inferential. SPSS 17.0 is the statistical package to be used for all procedures. All variables (gender, race, ACT score, SAT score, high school percentile class rank, Student Readiness Inventory results, and first semester college GPA) produced descriptive statistics.

Delimitations and Limitations

The participants in this research study were limited to first semester college freshman beginning their college course work at a mid-sized, southwestern public university. Many colleges use conventional predictors of college readiness to determine the need for remedial course work among incoming students. In order to demonstrate a correlation between the SRI and student success in college, the sample included only students who met the criteria for college readiness as indicated by the placement of all participants in credit bearing course work during their first year of college. The sample size for the study is (n) 5279. Each participant voluntarily completed the SRI at freshman orientation prior to the first day of college course work.

An additional limitation was the use of secondary data. Secondary data are information not specifically gathered for the research question at hand (Stewart, 1984). The use of secondary information has both advantages and disadvantages. The advantage of using secondary data is savings in time and in money. It is much less expensive and more efficient than collecting data with research instruments. When sources of data are already archived and stored, additional data collection by surveys or other research instruments may introduce unnecessary error into the study.

There are also disadvantages to using secondary data. The disadvantages of secondary include deliberate or unintentional bias and errors related to aggregation, category definition, measures, and timeliness (Stewart, 1984). Unintentional bias can occur when data are gathered for a purpose other than that intended for the study. Intentional bias can occur when data sets are purposefully altered or corrupted to achieve a desired objective. Information is lost when data sets are combined, summarized, or otherwise aggregated. Categories and levels of measurement may not work within the framework of the investigation. Finally, secondary data are older data sets. Access to the original data and an understanding of its generation and collection, as in this study, minimizes the disadvantages of using secondary data (Church, 2002).

Assumptions

Participants in this study were limited to those students who are permitted to enroll in credit bearing course work during their first semester at the university. The participants completed the Student Readiness Inventory (SRI) at freshmen orientation seminar prior to the first day of enrollment in credit bearing course work. In order to accurately reflect results of the SRI, the study includes the following assumptions:

1. Each SRI is administered following the procedures and guidelines governing the use of the instrument.
2. Responses received from participants provide accurate, reflective answers to each item.
3. Participants are afforded ample time to be reflective and provide meaningful responses to each item.

4. Participants understand the context of each item.

Data Analysis

This study used archival data from the university's office of Institutional Research and Effectiveness; the data was queried by analyzing all data by specific race, ethnicity, and gender. The independent variables of interest to be evaluated by the aforementioned demographics include high school percentile class rank, composite ACT score or composite SAT score, and the 10 themes measured by SRI. The dependent variable of interest in this study was first semester college grade point average. Results from the analysis are displayed in appropriate tables designed to demonstrate the relevancy of each independent variable in predicting college success.

The data analysis for the study includes differential statistics and inferential statistics. SPSS 17.0 was the statistical package for all procedures. All variables (race, ethnicity, gender, high school percentile class rank, composite ACT score, composite SAT score, 10 themes measured by the SRI, and first semester college grade point average) produced descriptive statistics regarding the prediction of college grade point average. The inferential statistics included the results from the multiple regression model. The multiple regression model addressed the research question discussed in Chapter 1 regarding the relevancy of predicting college success.

Multiple regression presents numerous models for selecting a set of predictors, such as hierarchical, forward, and backward selection procedures (Stevens, 2002). Multiple regression, with the covariates first entering the equation at the beginning of the data set, was best suited for this study's requirements based upon the substantial

evidence derived from the review of literature. The benefits of this approach becomes more clear by selecting predictors identified through the review of literature and the substantive knowledge to be gained by their use in the regression.

Chapter Summary

In summary, the purpose of this study was to investigate variables for predictive power in regards to college student academic performance as measured by first semester college grade point average. This study focused on the academic performance of first semester college students, who were enrolled in credit bearing classes, and utilized a multiple regression model to investigate the variance in first semester college student grade point average using these conventional academic predictors of college readiness, high school percentile class rank, composite ACT score, composite SAT score, and the 10 themes measured by the SRI. The results of this study may guide K-12 educators in developing a more college ready student by identifying specific areas, both academic and non-academic, in need of improvement.

CHAPTER 4

RESULTS

Introduction

This study explored the predictive potential of traditional academic indicators of composite SAT scores, composite ACT Scores, high school percentile class rank, and the ten themes of the Student Readiness Inventory (SRI) on college academic performance as measured by first semester college grade point average. The sample included high school graduates enrolled in credit bearing classes at the University of North Texas for two successive fall semesters. These students were determined to be college ready by the standards at the University of North Texas. All students in the study were enrolled in credit bearing coursework. The two research questions focused on the predictive power of these variables' to determine the readiness of these students for college level academic work. This chapter reports the findings related to this investigation in sections: (a) descriptive statistics, (b) results of the psychosocial factor multiple regression on first semester GPA, (c) results of the academic factor multiple regression on first semester GPA, and (d) results of the hierarchical multiple regression on first semester GPA.

General Model Requirements

Different types of multiple regressions are distinguished by the method for entering the independent variables into the analysis. In a standard multiple regression, all of the independent variables are entered into the analysis at the same time. In a hierarchical multiple regression, the independent variables are entered in an order as

prescribed by the analyst. This order is determined by a guiding theory or hypothesis as to which variables are included in the model. In this study both methods were used to address each of the research questions.

Multiple Regression

To test the hypotheses that first semester college grade point average is a function of both academic and psychosocial factors. The academic predictors entered into a multiple regression were composite ACT, composite SAT, percentile class rank and the psychosocial factors entered were the ten themes of the Student Readiness Inventory.

Assumptions for completing the multiple regression include the level of measurement, determinations of sample size, assumption of normality, assumption of linearity, assumption of homogeneity of variance, detecting outliers, assumption of independence of errors. The variables included in the analysis satisfy the level of measurement requirements, and the number of variables and cases satisfy sample size requirements. Each metric variable satisfies the assumption of normality, meaning each variable satisfies criteria for normal distribution. The relationship between the dependent variable and the metric independent variable satisfies the assumption of linearity. The variance in dependent variable is uniform across the independent variables satisfying the assumption of homogeneity of variance. No outliers were detected in the regression analysis.

In a multiple regression analysis, the preferred sample size requirement is larger; 20 times the number of independent variables (Stevens, 1996). The current sample size of (n) 5279 exceeds the preferred sample size of 260. The primary purpose of

regression is to identify the best subset of predictors and the order in which variables were included in the equation.

Descriptive Statistics

The procedures outlined in Chapter 3 were followed for this investigation. The University of North Texas provided data for all first time freshman students entering the university in the fall of 2009 and the fall of 2010. Data provided by the university included only students enrolled in credit bearing classes. These students were not enrolled in remedial course work, and were considered college ready by university admissions and placement standards. A total of 5279 (*n*) participants met all requirements for inclusion in this study.

Table 1 shows the descriptive statistics for the participants. Number (*N*) percentage (%) describes the categorical variables. The range, mean, and standard deviation (*SD*) describes interval-level variables. An overview of the control variables revealed the participants were mostly female (53.9%) and White (59.2%). The average composite ACT score for the participants in the study was 23.96, compared to an average composite score nationally of 21.1 in 2009, and 21.0 in 2010. Participants also fared well when compared to the average composite ACT scores in Texas of 20.8 in both 2009 and 2010 (ACT, 2011). The average composite SAT score of participants is 1119.15, compared to 2009 scores in Texas and nationally of 1016, and 1017 in 2010 (College Board, 2011). The average percentile high school class rank for the participants was 72.63. Meaning most students deemed college ready by the university were near the top 25% of their graduating class.

The ten-themes of the Student Readiness Inventory were the second set of variables of study. The average for all themes of the SRI on a scale range of 1-99 for Commitment to College was 65.47, Goal Striving was 60.23, Academic Discipline was 57.28, General Determination was 62.44, Study Skills was 59.22, Communication Skills was 62.17, Social Activity was 54.72, Social Connectedness was 60.41, Academic Self-Confidence was 63.09, and Steadiness was 62.12.

Table 1

Descriptive Statistics for Study Participants

Variable	N	%	Range	Mean	SD
Gender					
Female	2844	53.9			
Male	2435	46.1			
Ethnicity					
African American	659	12.5			
American Indian	63	1.2			
Asian	448	8.5			
Hispanic	923	17.5			
White	3076	58.2			
Other	37	.7			
No Response	73	1.4			
Composite ACT Score	5870		12-36	23.96	3.43
Composite SAT Score	5870		570-1600	1119.15	132.48
Percentile Class Rank	5870		2-100	72.63	16.44
Commitment to College	5279		1-99	65.47	27.29
Goal Striving	5279		1-99	60.23	27.53
Academic Discipline	5279		1-99	57.28	28.67
General Determination	5279		1-99	62.44	26.90
Study Skills	5279		1-99	59.22	27.44
Communication Skills	5279		1-99	62.17	26.57
Social Activity	5279		1-99	54.72	29.75
Social Connectedness	5279		1-99	60.41	26.30
Academic Self-Confidence	5279		1-99	63.09	25.28
Steadiness	5279		1-99	62.12	27.93

Relevance level of Psychosocial Factors on First Semester GPA

Table 2 shows the correlation among psychosocial factors. The themes of the SRI with highest correlations with first semester GPA were Academic Discipline ($r=.273$) and General Determination ($r=.132$). The weakest correlations of themes were Steadiness ($r=.008$) and Goal Striving ($r=.058$). Two of the themes of the SRI were negative relationships between the theme and first semester GPA; Social Connection ($r=-.029$) and Social Activity ($r=-.090$).

When converted to r^2 , the Academic Discipline, the theme with the highest correlation with first semester grade accounted for 7.5% of the variance in first semester GPA, General Determination accounts for 1.7% of the variance. When acting independently of one another, all other factors accounted for less than 1% each.

Table 2

Correlation among Psychosocial Factors

	1	2	3	4	5	6	7	8	9	10	11
1. Fall GPA	1.00										
2. Commitment to College	.082	1.00									
3. Goal Striving	.058	.510	1.00								
4. Academic Discipline	.273	.442	.578	1.00							
5. General Determination	.132	.488	.764	.708	1.00						
6. Study Skills	.097	.322	.572	.475	.580	1.00					
7. Communication Skills	.060	.342	.494	.357	.529	.491	1.00				
8. Social Activity	-.090	.253	.429	.139	.268	.195	.331	1.00			
9. Social Connection	-.029	.341	.472	.281	.380	.313	.535	.608	1.00		
10. Academic Self Confidence	.069	.271	.455	.323	.321	.264	.162	.235	.173	1.00	
11. Steadiness	.008	.247	.413	.323	.363	.301	.398	.284	.213	.300	1.00

Relevance Level of Academic Factors on First Semester GPA

Table 3 shows the correlation among academic factors. The academic factor with highest correlations with first semester GPA was Percentile Class Rank ($r=.328$). The weakest correlations factors was composite SAT ($r=.236$). All three academic factors had a positive relationship with first semester grade point average.

When converted to r^2 , Percentile Class Rank, the highest correlating academic factor accounted for 10.8% of the variance in first semester college GPA. The weakest correlation, composite SAT score, accounted for 5.5% of the variance in first semester grade point average.

Table 3

Correlation among Academic Variables

	1	2	3	4
1. GPA	1.00			
2. ACT	.243	1.00		
3. SAT	.236	.981	1.00	
4. Percentile	.328	.112	.110	1.00

Relevance Level of Academic and Psychosocial Factors on First Semester GPA

Table 4 shows the correlation among both psychosocial and academic factors. When psychosocial and academic factors are regressed together as 13 independent variables, the variable with the highest correlations to first semester grade point average is percentile class rank ($r=.327$), Academic Discipline ($r=.276$), composite ACT score ($r=.247$), and composite SAT ($r=.238$).

When grouped together as academic factors the group accounted for 15.1% of the variance in first semester GPA. Adding the psychosocial factors to the regression accounted for an additional 7.4% in variance. In combination, the psychosocial factors and academic factors accounted for 22.5% of the variance in first semester college GPA, leaving 77.5% of the variance unexplained.

Table 4

Correlations of Academic and Psychosocial Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Fall GPA	1.00													
2. ACT	.247	1.00												
3. SAT	.238	.981	1.00											
4. Percentile	.327	.121	.119	1.00										
5. Commitment to College	.084	-.082	-.075	.113	1.00									
6. Goal Striving	.061	-.113	-.108	.092	.507	1.00								
7. Academic Discipline	.276	-.089	-.080	.340	.442	.577	1.00							
8. General Determination	.136	-.146	-.139	.154	.487	.763	.708	1.00						
9. Study Skills	.091	-.075	-.073	.062	.323	.574	.477	.591	1.00					
10. Communication Skills	.065	-.047	-.046	.004	.340	.492	.356	.528	.492	1.00				
11. Social Activity	-.087	-.107	-.103	-.086	.253	.430	.139	.267	.196	.329	1.00			
12. Social Connectedness	-.026	-.096	-.088	-.026	.342	.473	.279	.380	.314	.533	.608	1.00		
13. Academic Self Confidence	.073	.361	.352	.243	.268	.454	.325	.320	.267	.159	.231	.172	1.00	
14. Steadiness	.012	-.003	-.002	.014	.246	.413	.324	.363	.302	.397	.281	.211	.299	1.00

Conclusion

This chapter provided an overview of the study findings as they related to participant demographics and data to address both of the research questions. Tables were provided to show output of the multiple regression for academic factors relevant to GPA, and psychosocial factors and a hierarchical multiple regression inclusive of both groups of factors. The next chapter provides an overall review of the study's purpose, methods, and results. The findings are interpreted and discussed to link results with research and provide recommendation for future study.

CHAPTER 5

DISCUSSION

Introduction

This dissertation concludes with a summarization of the initial chapters to provide a comprehensive overview of the study. In this chapter, the research problem is restated followed by a review of the methodology and summary of results. The results are discussed regarding the relevancy of psychosocial factors identified by the Student Readiness Inventory (SRI) in predicting college success, and the relevancy of conventional academic indicators in predicting college success. This discussion includes an interpretation of the findings, the relationship to research, and suggestions for further study.

Statement of Problem

The purpose of this study, as stated in Chapter 1, was to better predict how a first semester college freshman becomes prepared for college. In Vroom's' expectancy theory, motivation plays a key role in success (Vroom, 1964). Traditionally colleges and universities have relied mainly on academic factors to determine admissions and course placement. Since, today's high school graduates must possess the skills and knowledge to adapt rapidly to the ever-changing demands of a knowledge-based economy, perhaps the factors determining college readiness of perspective students should be expanded to include other metrics. According to the Education Commission of States (2005), students now need at least two years of postsecondary education to be successful in a workforce that requires advanced skills. In response to such need,

the goal of K-12 education should be to prepare high school graduates for life after high school by teaching them the skills and knowledge that are essential for students to be ready for college level work (Boon, 2008). The problem for this study, therefore, was to analyze the predictive relationships between conventional predictors of college readiness and other academic and social factors that may be better predictors of college success.

Review of Methodology

The methodology of this study, as outlined in Chapter 3, was developed using a quantitative research design. This study answered research questions regarding the relevancy psychosocial factors identified by the Student Readiness Inventory in predicting college success, and the relevancy of conventional academic indicators in predicting college success. This quantitative study utilizes a multiple regression model to investigate the variance in first semester college student grade point average (CGPA) using conventional academic predictors of college readiness and student responses on a student questionnaire, the SRI. A hierarchical regression was conducted to analyze the correlations of the academic predictors followed by the psychosocial factor regression. The SRI is designed to measure psychosocial factors and related academic skill factors found to predict two important college outcomes; academic performance and retention.

The independent variables of interest include high school percentile class rank, composite ACT scores, composite SAT scores, and the 10 themes as measured by the SRI. The 10 themes of the SRI are academic discipline, general determination, goal

striving, commitment to college, study skills, communication, social connection, social activity, academic self-confidence, and steadiness. The dependent variable of interest was first semester college GPA.

This study used a multiple regression model to determine the best predictors of college success from the independent variables, and a hierarchical multiple regression inclusive of first academic predictors, then the psychosocial factors as identified by the SRI. College success was measured by first semester college GPA.

Summary of Results

Study findings were outlined in Chapter 4 in alignment with the 2 research questions guiding the study. This section restates each of the research questions and summarizes the results.

Research Question 1

The initial research question stated the following: What psychosocial factors identified by the Student Readiness Inventory (SRI) are most relevant in predicting college success? The data supporting Research Question 1 was analyzed using a multiple regression. Academic Discipline ($r=.273$) accounted for 4.2% of variance in first semester college GPA, General Determination accounted for 1.7% of the variance in first semester college GPA, and the remaining psychosocial factors accounted for less than 1% of the variance in first semester college GPA. Although only one theme, Academic Discipline had a correlation of $>.20$, when the correlation of all factors are

included in the variance, the SRI accounted for 7.4% of the variance in first semester college GPA.

Research Question 2

Research Question 2 stated: What conventional academic indicators are most relevant in predicting college success? The data supporting Research Question 2 was analyzed using a multiple regression. Percentile class rank ($r=.328$) accounted for 10.7% of the variance in first semester college GPA, Composite ACT score ($r=.243$) accounted for 5.9% of the variance in first semester college GPA, and composite SAT ($r=.236$) accounted for 5.6% of the variance in first semester college GPA.

Discussion of the Results

This study provided results that are statistically significant. This section provides an interpretation of these findings, the relationship to research in Chapter 2 and further recommendations for practitioners and researchers.

Interpretation of the Findings

This study was designed to identify the relevancy of conventional academic predictors of college readiness and the psychosocial factors identified by the SRI. The dependent variable was first semester college GPA.

The results of the regression on first semester college GPA (see Table 2) identified relevant psychosocial factors to first semester college GPA. Academic Discipline was the psychosocial factor identified by the regression as the predictor

explains the most variance in first semester college GPA. The ability of a student to maintain the discipline necessary to be successful at college level work been studied previously. Campbell (2005) identified learning and study strategies that are indicative of college preparedness as early as the tenth grade. Eccles et. al. (2001), stressed the importance of intrinsic motivation, academic discipline, and concrete study skills as essentials in academic achievement. Although Academic Discipline accounts for only 4.2% of the variance in first semester college GPA, this SRI theme is best predictor of the ten themes.

Academic Discipline and General Determination are the best two individual themes in explaining the variance in college GPA; however, the entire SRI in its entirety does provide value to admissions offices and k-12 educators. The combination of all themes accounts for 7.4% of the variance in first semester GPA. Studies by Kuh, et al (2008), and Le et al (2005) attempted to associate these factors with college outcomes. This study attempted to analyze psychosocial factors on their value of acting as predictors to college success. Analysis of the results indicate using the SRI alone is not enough, but neither is the use of solely academic factors

The results of the second regression on first semester college GPA (see Table 3) identified the conventional academic factors on first semester college GPA. The validity of composite SAT and composite ACT scores have long been questioned in determining college success (Lenning & Maxey, 1973), (Klugh & Bierly, 1959), (Horn, 2005) .Analysis of the data in this study support such question. Composite ACT scores account for 5.9% of the variance in college GPA and composite SAT scores account for

5.6% of the variance in first semester college GPA. These two academic indicators are no better at explaining college GPA than the themes of the SRI.

The third independent academic variable, percentile class rank was the best predictor of college success among the variables analyzed. Percentile class rank accounted for 10.8% of the variance in first semester college GPA. This finding is consistent with the research reviewed in Chapter 2. Specifically, the post-World War II era research with an emphasis on conventional predictor variables such as high school GPA (Hillis, 1964), high school class rank (McDonald & McPherson, 1975), and the long term cumulative GPA (Wolfe & Johnson, 1995). These studies identified various predictors of college success, and the data from this analysis supports those findings.

Relationship to Research

As stated in Chapter 2, research reading college readiness, and the predictors of college success is limited mostly to academic factors (ACT 2006, 2007a; Adelman, 2006; Brown & Conley 2007; EPIC 2009; Geiser & Studley 2002). This study adds to the ever growing body of research focusing on college readiness. This section looked at the relationship between the outcome of this study and the findings of previous research.

In response to Research Question 1, the psychosocial factors identified by the Student Readiness Inventory that are most relevant in determining college success are Academic Discipline and General Determination. This evidence of other non-academic factors contributing to college success directly aligns with the study of Geiger and Cooper (1995). In an educational setting, motivating students to put forth academic

effort depends on students' perceptions of the benefit of academic performance and their belief that exerting effort will actually lead to higher performance (Geiger & Cooper, 1995). Such findings align with those in this study of Academic Discipline and General Determination.

The value of such factors is also included in the development of motivational and expectancy constructs. Robbins et al 2004 meta-analysis paid particular attention to the development of the psychosocial themes of the SRI that led to successful matriculation to a college degree. As stated in Chapter 4, while there was not one factor with a high correlation to first semester GPA, the entire instrument was just as effective at predicting college success as the composite ACT or composite SAT.

In response to Research Question 2, the academic factor that is most relevant in determining college success is percentile class rank. The importance of access to rigorous course work and success in that course work is well documented. Adelman (2006) examined the rigorous factors leading to attainment of a bachelor's degree, and established the recommended Carnegie units of study. In this study, Adelman identified the Carnegie units by content area that were necessary for students to be successful in college. Success in these courses while in high school results in a higher percentile class rank, which in turn impacts college success.

Results of Adelman's study are consistent with the 2007 study conducted by the ACT, which found that a minimum rigorous high school graduation requirements should include four years of English, at least three years of math including rigorous courses in algebra I, geometry, and algebra II, three years of science, including rigorous courses in biology, chemistry, and physics, and three years of social studies (ACT, 2007a).

Success in such course work results in a higher percentile class rank, which results in college success.

The aforementioned studies stressed the importance of access to rigorous coursework, and the success in those courses, according to this study resulted in college success. The other academic indicators for this study were composite SAT and composite ACT scores. The result of this study is in line with Geiser and Studley (2002) which reports the SAT is a relatively poor predictor of student performance. Admission criteria that require mastery of curriculum content, such as high school grades, and achievement tests are more valid indicators of how students are likely to perform in college. The study further surmised the SAT as an admission criterion has a more adverse impact on poor and minority applicants than do high-school grades, class rank, and academic achievement. It is more important to consider student achievement indicators of minority students in rigorous coursework rather than the measurement of aptitude or academic potential of disadvantaged students.

Suggestions for Further Study

Although this study added to the research on the identification of college readiness, the depth of research remains shallow, providing a widespread opportunity for research in this area (Conley 2003). In order to build on this body of research, there are topics worthy of future study. First the stratified random sample used in this study included only students deemed college ready by the standards at The University of North Texas. Future research could stratify the sample to include students who were not determined to be college ready by university standards. Such a study might provide

additional insight into the usefulness of the SRI in admission selection. Inclusion of the SRI in admissions criteria may be one way to lessen the opportunity gap among student groups and students who for whatever reason struggled in high school.

In addition, future study could consider additional variables of study. For example, the same analysis could be completed within demographic groups to include a stratified random sample of participants by ethnicity, gender, or economic status. Such analysis would build on this body of research providing additional guidance admission officers and K-12 educators. Further inquiry into the school type such as rural, urban, suburban, or small city might provide additional insight into predictors of college success. Future research could also consider levels of education within the core family or first generation college students.

Implications of the Study

In Texas, high school graduates beginning with the graduating class of 2016 will be deemed college ready by the newly developed College and Career Readiness Standards (Conley 2007b). As a result, there will be many students graduating from Texas schools deemed not ready for college level work. K-12 administrators and higher education officials will be faced with the daunting task of how to address the needs of this student group.

As stated in the aforementioned studies, access to rigorous coursework is a key factor in college success. However, other than the curriculum audit required by the College Board for the AP program, there is not a standardization of rigor within specific courses. At the college level, there is no standardization of rigor with dual-credit

courses. A system of standardization in all courses, both high school and college, will be essential in the development of a more college ready student, and the establishment of true college readiness standards.

Summary

This chapter provided a comprehensive overview of this study on the relevancy of both the academic indicators and psychosocial factors on first semester college grade point average. This study was based on the understanding that K-12 educators are committed to graduating students who are prepared for post secondary success. Therefore, it is imperative that higher education officials and K-12 educators continue to recognize the importance of access rigorous coursework, and development of other psychosocial factors such as Academic Discipline, Academic Self Confidence, and Steadiness. Accessing rigorous course work is a primary consideration, and curriculum designed upon the enhancement of other non-academic factors.

This quantitative study supported prior research in finding the best predictor of college success was percentile class rank. In addition, this study also questioned the accuracy with which SAT and ACT predicts college readiness. Colleges and universities will most likely continue to use such measures to determine admission criteria, as well as placement in credit bearing courses. However, by including an instrument such as the Student Readiness Inventory (SRI), other factors to determine the readiness of students for college would be identified. This finding identifies the need to include other factors to determine college readiness and college admissions

What can also be derived from the study is being developmentally ready for college life is just as important as being academically ready. The social factors identified by the SRI had a negative effect on first semester student GPA, so colleges and universities will need to continue efforts to ensure successful matriculation through the university culminating with a college degree. These efforts may include academic seminars or social connections seminars. Academic seminars may include areas such as academic discipline, time management, or study skills. Social connection seminars may include methods to getting involved in campus life, intramural participation, or the establishment of specific hobby groups.

School systems that take the time to develop the whole child, as well as the academic child will see their students experience post secondary success. We can no longer afford to educate just the students who show academic prowess. By addressing the social and emotional needs as well as the academic needs of our students, we will expand our post secondary educational opportunities to additional groups of traditionally excluded students.

REFERENCES

- ACT. (2006). *Aligning postsecondary expectations and high school practice: The gap defined policy implications of the ACT National Curriculum Survey results*. Iowa City, IA: ACT.
- ACT. (2007a). *Rigor at risk: Reaffirming quality in the high school core curriculum*. Iowa City, IA: ACT.
- ACT. (2007b). *Setting students' sights on college: Chicago Public Schools*. Iowa City IA: ACT.
- ACT. (2008). *Meeting the challenge of a changing world. ACT's College Readiness System*. Iowa City, IA: ACT.
- Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington D.C.: Department of Education
- Alfone, J. R. (1997). Teachers' pursuit of professional development beyond requirements (Doctoral dissertation, University of Hartford, 1997). *Dissertation Abstracts International*, 58(04), 1202.
- Atkinson, R. C. (2001). *Standardized tests and access to American universities*. Paper presented at the 2001 Robert H. Atwell Distinguished Lecture, American Council on Education, Washington, DC.
- Bean, J. P. (1985). Interaction effects based on class level in an explanatory model of college student dropout syndrome. *American Educational Research Journal*, (22), 35-64.
- Bean, A.G., & Covert, R.W. (1973). Prediction of college persistence, withdrawal, and academic dismissal: A discriminant analysis. *Educational and Psychological Measurement*, 33, 407-411.
- Beck, H. P., & Davidson, W. D. (2001). Establishing an early warning system: Predicting low grades in college students from survey of academic orientations scores, *Research in Higher Education*, 42(6), 709-723,

- Bettinger, E., Long, B. (2005). *Addressing the needs of under prepared students in higher education: Does college remediation work?* Cambridge, MA.: National Bureau of Economic Research.
- Boon, H. J. (2008). Risk or resilience? What makes a difference? *Australian Educational Researcher*, 35(1), 81-102.
- Breneman, D. W., & Haarlow, W.N. (1998). Remediation in higher education: A symposium featuring remedial education: Costs and consequences. *Fordham Report*, 2(9).
- Brown, R. S., & Conley, D. T. (2007). Comparing state high school assessments to standards for success in entry-level university courses. *Educational Assessment*, 12(2), 137-160.
- Cabrera, A. F., Deil-Amen, R., Prabhu, R., Terenzini, P. T., Chul, L., & Franklin Jr, R. E. (2006). Increasing the college preparedness of at-risk students. *Journal of Latinos & Education*, 5, 79-97.
- Campbell, C. L. (2005). *Preparing for college: Identifying the learning and study strategies associated with varying levels of college preparedness in tenth graders*. Ph.D., The University of Texas at Austin, United States -- Texas.
- Conley, D. T. (2003). Connecting the dots: Linking high schools and postsecondary education to increase student success. *Peer Review*, 5(2), 9-12.
- Conley, D. T. (2005). What we must do to create a system that prepares students for college success. *Policy perspectives*. San Francisco: WestEd.
- Conley, D. T. (2007a). *Challenges in transition from high school to college*. Cambridge: Harvard Education Press.
- Conley, D. T. (2007b). Rethinking college readiness. Eugene OR: Educational Policy Improvement Center. (Commissioned by the Bill and Melinda Gates Foundation).
- Covington, M. (2000). Goal theory, motivation, and school achievement: An integrative review. *Annual Review of Psychology* (51), 171-200.

- Crouse, J., & Trusheim, D. (1991). How colleges can correctly determine selection benefits from the SAT. *Harvard Education Review*, 61, 125-147.
- Dalton, S. (1974). Predictive validity of high school rank and SAT scores for minority students. *Educational and Psychological Measurement*, 34, 367-370.h
- Dalton, S. (1976). A decline in the predictive validity of the SAT and high school achievement. *Educational Psychological Measurement*, 35, 455-448.
- Dougherty, C., Mellor, L., & Smith, N. (2006). Identifying appropriate college-readiness standards for all students. Austin, TX: National Center for Educational Accountability.
- Eccles, J. S., Wigfield, A., Neil, J. S., & Paul, B. B. (2001). Academic achievement motivation, development of. *International encyclopedia of the social & behavioral sciences* (pp. 14-20). Oxford, UK: Pergamon.
- Education Policy Improvement Council. (2009). Texas college and career readiness standards. Austin, TX: University Printing Services.
- Gall, M. G., Borg, W. R., and Gall, J. P (1996). *Educational research: An introduction* (6th ed.). White Plains, NY: Longman Publishers.
- Geiger, M. A., & Cooper, E. A. (1995). Predicting academic performance: The impact of expectancy and needs theory. *Journal of Experimental Education*, 63(3), 251-262.
- Geiger, M. A., Cooper, E. A., Hussain, I., O'Connell, B. T., Power, J., Raghundandan, K., et al. (1998). Using expectancy theory to assess student motivation: An international replication. *Issues in Accounting Education*, 13(1), 139-156.
- Geiser, S. (2009). Back to the basics: In defense of achievement (and achievement tests) in college admissions. *Change: The Magazine of Higher Learning*, 41(1), 16-23.
- Geiser, S., & Studley, R. . (2002). UC and the SAT; Predictive validity and differential impact of the SAT I, SAT II, and the University of California. *Educational Assessment*, 8(1), 1-26.

- Goodman, C. H. (1944). Prediction of college success by means of Thurstone's primary abilities tests1. *Educational and Psychological Measurement*, 4(1), 124-140.
- Gordon, M. A. (1974). Correlation and regression for ACT and SAT test scores. *Colleges and University*, 50, 82-84.
- Greene, J.P & Greg Forster (2003). Public high school graduation and college readiness rates in the United States. New York: *Manhattan Institute for PolicyResearch*, No. 3.
- Greene, J. P., Winters, M.A., . (2005). Public high school graduation and college-readiness rates: 1991–2002 *Manhattan Institute for Policy Research*, No. 8.
- Guerra, G. (2009). *A study of first-time-in-college students' college readiness: Using standards from the Texas Assessment of Knowledge and Skills and the Elementary Algebra ACCUPLACER*. The University of Texas at San Antonio, United States -- Texas.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Hedges, L. V., & Majer, K. (1976). An attempt to improve prediction of college success of minority students by adjusting for high school characteristics. *Educational and Psychological Measurement*, 36(4), 953-957.
- Hillis, J.R. (1964). Prediction of college grades for all public colleges of a state. *Journal of Educational Measurement*, 1, 155-159.
- Himmelstein, P. (1965). Validates and inter-correlations of MMPI sub-scales predictive of college achievement. *Educational and Psychological Measurement*, 4, 1125-1128.
- Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1998). *Applied statistics for the behavioral sciences* (4th ed.). Boston: Houghton Mifflin.
- Hoffman, N., Vargas, J., & Santos, J. (2009). New directions for dual enrollment: Creating stronger pathways from high school through college, *New Directions for Community Colleges*, 145, 43-58. San Francisco: Josey-Bass
- Horn, C. (2005). Standardized Assessments and the Flow of Students Into the College Admission Pool. *Educational Policy*, 19(2), 331-348.

- Klugh, H.E., & Bierly, R. (1959). The school and college ability tests and high school grades as predictors of college achievement. *Educational and Psychological Measurement*, 36, 439-443.
- Kuh, G. D., J. Kinzie, T. Cruce, R. Shoup, & R.M. Gonyea. (2006). Connecting the dots: multifaceted analyses of the relationships between student engagement results from the NSSE and the institutional policies and conditions that foster student success. Bloomington, IN: Indiana University Center for Postsecondary Research.
- Lavin, D.E. (1965). *The prediction of academic performance: A theoretical analysis and review of research*. New York: Russell Sage Foundation.
- Le, H., Casillas, A., Robbins, S. B., & Langley, R. (2005). Motivational and skills, social, and self-management predictors of college outcomes: Constructing the student readiness inventory. *Educational and Psychological Measurement*, 65(3), 482-508.
- Lee, J. W. R., A. (2008). Report of the commission on access, admissions, and success in higher education *Coming to Our Senses: Education and the American Future*. New York.
- Lee, J. W. R., A. (2010). The college completion agenda 2010 Progress Report. In J. W. R. Lee, A. (Ed.): The College Board.
- Leedy, P. D., & Ormrod, J. E. (2001). *Practical research: Planning and design* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Lenning, O.T., & Maxey, E.J. (1973). Act versus Sat prediction for present-day college and students. *Educational and Psychological Measurement*, 33, 397-406
- Lincoln, Y. S. (1983). Expectancy theory as a predictor of grade-point averages, satisfaction, and participation in the college environment. ASHE 1983 Annual Meeting Paper.
- Mahoney, C., Lain, J., & Clark, C.,. (2009). Barriers to implementing college and workforce readiness initiatives in Texas. Austin: Texas Association of School Boards.

- McDonald, J.F., & McPherson, M.S. (1975). High school type, sex, and socioeconomic factors as predictors of the academic achievement of university students. *Educational and Psychological Measurement, 35*, 929-933.
- Misanchuk, E.L. (1977). A model-based prediction of scholastic achievement. *Journal of Educational Research, 71*, 30-35.
- Munday, L. (1965). Predicting college grades in predominantly negro colleges. *Journal of Educational Measurement, 2*, 157-160.
- Nakkula, M. J., & Foster, K.C. (2007). Academic Identity development: Student experiences in two early college high schools. In N. Hoffman, Vargas, J., Venezia, A., and Miller, M. (Ed.), *Minding the gap, Why integrating high school with college makes sense and how to do it*. Cambridge, MA: Harvard Education Press.
- Nisbet, J., Ruble, V., & Scchurr, K. (1982). Predictors of academic success with high risk college students. *Journal of College Student Personnel, 23*, 227-235.
- Noble, J.P., & Sawyer, R.L. (1989). Predicting grades in college freshman English and mathematics courses. *Journal of College Student Development, 30*, 345-353.
- Norton-Welsh, C., & Reding, K. (1992). Predicting success in collegiate accounting courses. *Journal of Education for Business, 67*, 314-316.
- Oliver, H. (1995). Influence of motivational factors on performance. *Journal of Instructional Psychology, 22*(1), 45-49.
- Pascopella, A. (2010). Common core standards are welcome-- with some reservations. *District Administration, 46*(4), 21-22.
- Pedhazer, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). Orlando, FL: Harcourt.Brace
- Pintrich, P. R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology, 25*(1), 92-104.

- Rainwater, T., Mize, D.A., & Brooks, N.S. (2008). *Education beyond the rhetoric: making "rigor" something real*, Paper presented at the State Scholars Initiative National Summit on Academic Rigor and Relevance.
- Reid, M. J., & Moore, J. L., III. (2008). College readiness and academic preparation for postsecondary education: Oral histories of first-generation urban college students. *Urban Education, 43*(2), 240-261.
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis, *Psychological Bulletin, 130*(2), 261-288.
- Schunk, D. H. (2000). Coming to terms with motivation constructs. *Contemporary Educational Psychology, 25*(1), 116-119.
- Schunk, D. H., & Zimmerman, B. J. (2003). Self regulation and learning., In W.M. Reynolds & G.E. Miller (Eds.), *Handbook of psychology*, (Vol. 7, pp. 59-78). New York: John Wiley.
- Stern, D., & Briggs, D. (2001m January-February). Changing admissions policies: Mounting pressures, new developments, key questions. *Change, 33*, 34-41.
- Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Nahwah, NJ: Erlbaum.
- Tatham, C.B., & Tatham, E.L. (1974). Academic predictors for black students. *Educational and Psychological Measurement, 34*, 371-374.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research 45*, 89-125.
- Tinto, V. (1993). *Leaving College: Re-thinking the cause and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.
- Wainer, H., Saka, T., & Donoghue, J. (1993). The validity of the SAT at the University of Hawaii: A riddle wrapped in an enigma. *Educational Psychological Measurement, 54*, 404-408.

Wolfe, R. N., & Johnson, S. D. (1995). Personality as a predictor of college performance. *Educational and Psychological Measurement, 55*, 177-185.

Vroom, V. (1964). *Work and Motivation*. New York: John Wiley.