

PREDICTORS OF ACADEMIC SUCCESS FOR CONDITIONALLY ADMITTED
FIRST-TIME FRESHMEN AT A FOUR-YEAR PUBLIC UNIVERSITY

A Dissertation
presented to
the Faculty of the Graduate School
at the University of Missouri

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
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MAY 2010

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*The undersigned, appointed by the Dean of the Graduate School, have examined a
dissertation entitled:*

PREDICTORS OF ACADEMIC SUCCESS FOR CONDITIONALLY ADMITTED
FIRST-TIME FRESHMEN AT A FOUR-YEAR PUBLIC UNIVERSITY

Presented by Robert S. Hornberger

A candidate for the degree of Doctor of Education

And hereby certify in their opinion it is worthy of acceptance.

Dr. Cynthia MacGregor

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Dr. Diana Garland

Dr. Robert Watson

DEDICATION

This dissertation is dedicated to my beautiful, wise, and loving wife, Kristie Hornberger.

Her support during the process of attaining this degree and life in general, thoughtful advice, and understanding of the need for comedic moments have been sincerely appreciated. Her greatest love language is quality time, and she has selflessly sacrificed it during this season of our life. She is my best friend and companion in life.

And

To my son, Sam Hornberger, who I greatly admire and appreciate. His patience and support, when he would much more prefer my time for playing and chatting, highlights the strong character he possesses while growing up to be a young man of integrity. He is a great companion in life.

And

To my mother, Marty Hornberger, who taught me many of the core principles in my life. Three of those, which applied to the process of writing this dissertation, are: being an active listener, commitment to a goal, and being non-judgmental toward others.

And

To my late father, Kent Hornberger, Sr., who served as an example of displaying a strong will, perseverance, and self-discipline, along with an understanding of the need for grace, love, dignity, and respect.

And

To my brother, Kent Hornberger, Jr., who has been a supportive older brother for many years. A simple, childhood agreement on a playground, to quit bickering and instead be friends, has maintained its soundness to this day. We continue to be great pals.

ACKNOWLEDGEMENTS

*If you can dream - and not make dreams your master;
If you can think - and not make thoughts your aim;*

...

*If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the Will which says to them: "Hold on";*

...

*If you can fill the unforgiving minute
With sixty seconds' worth of distance run -
Yours is the Earth and everything that's in it,
And - which is more - you'll be a Man my son!*

--Rudyard Kipling (1865-1936)

Like the above poem's clips imply, life is full of paradoxes. Finding the balance between competing goals and demands has been a challenge yet impetus for growth during this season in my life. The dissertation journey is not without its own paradoxes.

The road is hard and took me to battles I did not think I could conquer. Yet, the path of both minor and major accomplishments is exhilarating and rewarding.

The journey can effectively be described as a marathon. Yet, it includes some very challenging sprints.

The process is extraordinarily lonely. The mind is taken to deep places of uncertainty. The depth of the journey can only result in periods of isolation. Yet, the achievement would not exist without the collective extended hands and cheering voices of many involved along the way.

Thank you to my wife, Kristie, and son, Sam, for sacrificing many hours of time while I sat in my "cave." This accomplishment is not only mine. They share it. (Dr. Dudey has finally arrived.) And to my mom and brother (and his family), and my extended Watson, Hornberger, and Pomrening families, for cheering me along the way.

Thank you to my committee chair, Dr. Cindy MacGregor, who was very supportive during my “lock and load” approach to finishing my dissertation. She was the essence of an advisor, and an encourager as well. Thank you to another committee member and cohort instructor, Dr. Robert Watson. The balance of wisdom and nurture he brought to our group, and specifically to me, was often a silent, yet significant motivator. Thank you to my other committee members, Dr. Gilbert Brown and Dr. Diana Garland, both who uniquely contributed to the paper, helping to make it even stronger in the end.

Thank you to my supervisor, Mr. Don Simpson, who has been extremely supportive both professionally and personally during my three years of doctoral work and beyond. Many of his thoughts helped inspire the final project and he has been a great example to me in my career. Thank you to the staffs of the Offices of the Registrar and Enrollment Services, both in which I’ve worked during the doctoral process. They have all carried some extra weight while I’ve been physically (or mentally) absent.

Thank you especially to several Missouri State University colleagues who went above and beyond by providing help specific to this project. Dr. Kathy Coy provided great advice regarding data sets, statistical analyses, and dissertation work in general. Ms. Annette Miller Gartin provided invaluable assistance and guidance in both running analyses in SPSS and interpreting them. And Ms. Prabhashi Nanayakkara Sattambige dedicated many hours of tedious work helping to create the data set used in this project.

Thank you to members of the University of Missouri Educational Leadership doctoral program cohort six, including group B-1 from summer 2007 and summer 2008 coursework, the Missouri State University group who uniquely bonded very closely, and

my “employees of Missouri State University” accountability group, Stephanie Hein, Thomas Lane, and Allan Liggett. I couldn’t have done without you.

The greatest paradox in my life is that offered by the Lord and Savior of my life, Jesus Christ. He had to die so that I could live. I acknowledge the glorious mystery of the presence of God in my life and thank Him for the grace and mercy that have made me who I am. My chief end in life is to glorify Him by enjoying Him in everything, including this doctoral process and dissertation journey.

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ABSTRACT

This quantitative study examined a sample of 249 conditionally admitted first-time freshman at a four year public university to answer four research questions pertaining to the potential prediction of academic success and college retention for conditional admits. The single-stage, convenience sample (Creswell, 2003) included variables related to student demographic, academic admission, first year academic success, and college admission factors were included in the study.

The findings of the study revealed that an emphasis on core curriculum classes taken during high school, especially the senior year, and the core curriculum coursework GPA should be emphasized by policymakers as determinants for admission exceptions. The results also highlighted the ACT English sub score for the full sample, and the high school GPA for the male sub group, as significant predictors of academic success and college retention.

Other factors analyzed in the study, including the type of high school, whether a student earned college credit prior to college, whether a student participated in high school athletics, whether a student was an athlete at the college of study, ethnicity and race, whether the student received application for admission fee waiver, and the type of conditional admit, did not qualify as significant predictors in the final statistical model.

CHAPTER ONE

INTRODUCTION TO THE STUDY

Background

Student recruitment and retention have been an ongoing emphasis within higher education (Carey, 2005; Heldman, 2008; Lederman, 2009). In particular, the conditional admittance of students (i.e., accepting students who do not meet the stated admission requirements) is of interest in how it relates to the areas of (a) general policy (Fowler, 2009); (b) admission policies, criteria, and decisions (Hoxby, 2009, Keller & Hoover, 2009); (c) the high school to college transition and learning (Bruffee, 1999; Chickering, 2006; Chickering & Kuh, 2005; Nonaka, 1994) ; and (d) academic success and college retention (Kretchmar, 2006; Upcraft, Gardner, Barefoot, & associates, 2005; Vivo & Franco, 2008). In response to these issues, university administrators have considered various best practices for predicting a potential conditionally admitted student's academic success at the institution. This convention is applicable to educators involved in admission appeal processing and various stakeholders who debate about the decision, especially when evaluating a multitude of factors submitted by the student.

The decision regarding a student's admissibility to a university relates to both policy and practice. Fowler (2009) discussed the disparity and assimilation of formal procedures yet informal practices within the domain of educational policy. Educational policy is often politically influenced (Fowler) and provides the framework (Callan & Finney, 2003; Heck, 2004) for various procedures and practices established in educational arenas. The infrastructure of policy includes politics at a local, state, and

federal level (Spillane, Reiser, & Reimer, 2002), economic considerations (Callan & Finney), and attention to context and stakeholders.

Policy also directly affects procedures and practices. The process of policy is incremental in nature (Hannah, 1997). Fowler described a stage model for policy process that includes issue definition, agenda setting, policy formation, policy adoption, implementation, and evaluation. This model helps to articulate that procedures are challenging to form, often irregular, and tedious to manage. Additionally, they are often circumstantial, based on the current context, and also influenced by internal and external stakeholders. Consequently, evaluation is used to determine the relevance, effectiveness, and significance of the policy and procedures (Rossi, Lipsey, & Freeman, 2004).

One form of educational policy and practice is the utilization of protocols within the admission process. This study focuses on the specific policies and procedures regarding a university's admission of first-time freshmen. Keller and Hoover (2009) noted multifaceted characteristics and challenges regarding the admission process and application review. Admission policies tend to be complex and difficult to understand (Keller & Hoover; Kretchmar, 2006). Additionally, flexibility regarding alternatives for admission and even interpretation of the policy is often characteristic of an admission policy. Considerations regarding socioeconomic and racial diversity philosophically and politically influence how both the policy and procedures are practiced (Beckman, 2006; Brown & Hirschman, 2006; Gilbert, 2008; Fischer, 2007; Keller & Hoover; Ly, 2008; Schmidt, 2007; Selingo, 1999). Review of the full application is most often comprehensive, leading to a high volume of material to analyze and meticulous method for evaluation (Keller & Hoover). Lastly, admission policies are often impelled by state

and regional initiatives, such as enforcement of accreditation requirements and selectivity levels (Hoover, 2008; Illinois State Board of Higher Education, 1995).

Another factor affecting college admission policies and the process of admitting students who do not meet the stated policy is the conflict of institutional goals regarding academic excellence and athletic excellence. On one hand, universities have a strong focus on academic success and student retention (Kretchmar, 2006; Upcraft, Gardner, Barefoot, & associates, 2005; Vivo & Franco, 2008). Therefore, the admittance of students who do not meet the admission requirements is contrary to an institution's academic goals. On the other hand, universities also deal with internal and external pressures to succeed athletically (Hill, Burch-Ragan, & Yates, 2001; Katz, 2001; Zimbalist, 1999). This conflict has several implications. As Suggs and Welch (2001) noted, "athletes in their programs have a huge advantage in the admissions process and graduate at a higher rate but...most of them receive worse grades than the majority of their peers" (p. A39). Gehring's (2001) summary of The Knight Foundation Commission on Intercollegiate Athletics stated that student athletes and non-athletes should be addressed similarly in admission decisions and graduation requirements. Shulman and Bowen (2001) also asserted that college athletes receive preferential treatment in the admission process but also underperform academically when compared to non-athletes. Thus both conflict between institutional goals and within the literature regarding the academic success of athletes and non-athletes exists.

This inconsistency also has implications for the practitioners within higher education. Katz (2001) emphasized the important role registrars and admission officers play when setting expectations and academic policies in regard to student athletes and the

student body in general. Katz urged practitioners to utilize the same agencies for admission to the college, evaluation of academic performance, and certification of academic standing when considering both athletes and non-athletes. Meanwhile, literature also indicates the practice of college coaches tagging high school athletes for recruitment and forwarding their names to the admissions office (Fried, 2007). Thus, while practitioners are urged to display equity in admission and academic evaluation processes, they are also inconsistently pressured to make certain exceptions for athletes. Wolverton (2008) noted that while admission standards for college athletes have decreased in recent years, national requirements for student athletes have increased. This further indicates a conflict regarding the admission of conditional athletes, even expanding the scope beyond the individual universities.

The institution under study in this project contained 249 conditionally admitted students who were admitted by decision of an admission appeals committee over a period of three fall semesters. Of this group, 104 (41.8%) were athletes and the remaining 145 (58.2%) were non-athletes. During this same time period, the university admitted a total of 7,937 students of the same type and class. Of this group, 356 (4.5%) were athletes and 7,581 (95.5%) were non-athletes. Of the conditionally admitted athletes, 28 (26.9%) were female and 76 (73.1%) male; and 26 (25%) were of a racial minority, 74 (71.2%) were non-minorities, and four (3.8%) did not indicate a race. This indicates first that a large proportion of the conditional admits were athletes. Moreover, the group of conditional admits was primarily comprised of male minority students.

Additionally, literature indicates criticism of certain measures of university admission requirements, especially standardized tests (Brown, 1999; Hoover, 2009;

Hoxby, 2009). Hoover's study articulated this concern by reporting colleges that were becoming test-optional and treating college admissions as more of an art than a science. Moreover, Clark, Rothstein, and Schanzenbach's (2009) study of selection bias in college admission test scores observed a high correlation between standardized test scores and average latent scores within the study. Questions exist regarding the validity and reliability of various standardized measures used within the college admission search.

Sedlacek (2004) also challenged the use of standardized tests and discussed other potentially useful measures for admission decisions. His work has highlighted a significant number of measures for assessing campus climate, monitoring behaviors towards other entities, and predicting determiners for student admission. Through his research, an admission measure called the Non-Cognitive Questionnaire was developed. Research regarding the validity of particular measures used for admission decisions continues to be an area of study and topic of debate.

This process is especially important when considering students who are admitted as exceptions to the admission policy. The institution under study in this project, recently researched the attrition rates of three sets of students comparatively. The research included an analysis of three classification groups, Honor's College students, regular admits, and conditional admits, for cohorts ranging from fall 1999 through fall 2007. The results indicated a significantly higher attrition rate for conditional admits than Honor's College students or regular admits (see Figure 1). The unsettled debate regarding the validity and reliability of accurate predictors for college admission, along with the significant rates of attrition for those students conditionally admitted to the university,

Attrition Rate Across Time for First-time, Full-time, First-year (Freshman) Students

Cohort & Fall Classification Group	Passage of Time																	
	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
1999	11.6	27.8	31.4	38.0	39.2	41.5	42.4	43.7	44.3	44.6	45.0	44.9	44.9	44.7	44.8	44.8	44.8	44.9
Honor's College	2.3	8.6	10.9	15.8	18.6	19.5	19.9	21.3	20.4	19.0	20.4	19.9	20.8	20.4	19.9	19.9	19.9	19.5
Regular	12.2	29.5	33.2	40.0	41.2	43.6	44.4	21.4	46.4	46.8	46.9	46.9	46.9	46.8	46.9	47.0	47.0	47.1
Conditional	20.0	33.6	40.0	40.0	40.0	43.1	52.3	50.8	55.4	56.9	60.0	60.0	56.9	55.4	55.4	55.4	56.9	56.9
2000	11.6	25.7	30.3	37.0	38.2	40.1	41.1	42.8	43.6	44.6	44.8	45.0	44.8	44.9	45.0			
Honor's College	3.4	12.1	13.5	17.9	19.3	18.8	19.8	21.3	21.3	21.3	21.3	20.8	21.3	21.3	21.3			
Regular	12.3	26.7	31.5	38.5	39.7	41.8	42.7	44.4	45.3	46.5	46.7	46.8	46.7	46.8	46.8			
Conditional	13.9	36.1	40.3	45.8	45.8	51.4	48.6	54.2	55.6	55.6	56.9	58.3	56.9	55.6	55.6			
2001	11.4	26.2	30.5	34.9	37.1	38.4	39.1	40.3	41.3	42.0	41.8	41.5	41.9					
Honor's College	2.8	11.4	14.2	17.1	18.5	19.0	19.9	21.3	21.8	21.8	20.9	19.4	19.9					
Regular	12.2	27.7	32.1	36.6	38.9	40.1	40.8	41.0	43.0	43.8	43.8	43.5	44.0					
Conditional	11.3	24.2	30.6	33.9	37.1	43.5	58.1	43.5	45.2	46.8	41.9	41.9	43.5					
2002	11.0	25.2	29.3	33.9	36.8	39.1	40.2	41.3	42.3	43.2	42.8							
Honor's College	4.2	7.4	7.4	11.6	14.8	16.7	17.1	19.9	21.3	20.4	20.8							
Regular	11.3	26.4	30.9	35.5	38.2	40.6	41.6	42.7	43.7	44.7	44.2							
Conditional	19.3	35.2	42.0	46.6	53.4	53.4	42.0	37.5	55.7	58.0	59.1							
2003	10.1	25.5	30.6	35.7	37.2	39.2	40.1	41.6	42.1									
Honor's College	3.0	8.7	9.9	12.5	12.5	13.3	14.4	15.6	15.6									
Regular	10.9	27.5	33.0	38.3	39.8	42.1	42.9	44.3	44.9									
Conditional	10.8	21.5	27.7	35.4	44.6	41.5	44.6	50.8	50.8									
2004	12.1	26.4	30.2	36.3	37.3	39.0	39.6											
Honor's College	2.4	7.8	8.6	11.4	12.7	13.9	13.9											
Regular	12.8	28.0	32.1	38.4	39.5	41.1	41.7											
Conditional	16.0	33.6	37.7	45.9	46.7	50.8	51.6											
2005	11.5	25.2	29.8	35.6	36.9													
Honor's College	2.9	10.4	13.7	15.8	17.0													
Regular	11.8	26.4	31.0	37.2	38.7													
Conditional	26.4	35.6	41.4	47.1	46.0													
2006	11.9	25.4	29.2															
Honor's College	1.7	6.3	8.4															
Regular	12.0	26.5	30.5															
Conditional	26.7	38.5	43.7															
2007	11.4																	
Honor's College	2.1																	
Regular	12.0																	
Conditional	24.0																	

Compiled by: Institutional Research, March 2008
Printed: 5/2/2008

Figure 1. Attrition Rate Across Time for First-time, Full-time, First-year Students at CSU. Reprinted by permission of Central State University.

help provide the groundwork for additional study regarding predictors of academic success and student retention for conditionally admitted students.

Hoxby (2009) noted that selectivity in the admission policy is practiced both for the success of the student and university. In regard to the student, a significant culture change takes place in transition from high school to college. Both social well being and academic success are of concern. The two topics are not isolated from one another.

Bruffee's (1999) work on collaborative learning defined parameters for social construction in terms that offer new models for academic curriculum. Nonaka (1994)

noted that individuals contain a growing spiral of knowledge, requiring continual recacculturation into new communities of knowledge (Bruffee). This phenomenon is magnified during a student's transition to college. With experience, and a foundation of knowledge created, students are able to grow and better adapt to various circumstances. Nonaka and Takeuchi (1995) defined this engrained stamp of an individual's experiences, beliefs, and values as tacit knowledge.

In regard to the university, a student is evaluated at the point of admission to determine likelihood of retention and academic success. An emphasis on enrollment, including both recruitment and retention of students, has continued to increase within higher education (Carey 2005; Heldman 2008; Lederman 2009). However, this is not a new accentuation. Many theories have emerged based on universities' emphasis on retention and persistence (Astin, 1993; Bean & Metzner, 1985; Braxton, Milem, & Sullivan, 2000; Pascarella, 2006; Pascarella & Terenzini, 2005; Tinto, 1994). Aitken's study of applying mathematical equations to both the admission decision process and analysis of policy revealed the relevant correlation between the required cultural adjustment and retention of a college student.

Works have been directed to teaching and learning (Chickering, 2006; Chickering & Kuh, 2005) for the purpose of improving academic success. Additionally, research has been applied to determining the influence of conditions and indicators that predict academic success. Vivo and Franco's (2008) research evaluated the use of a common metric for quantifying criteria used for admission purposes. Social conditions (Park & Kerr 1990; Rodgers, 2002), performance in particular academic subjects, high school grade card results (Vivo & Franco), student demographics, and other possible predictors

have been discussed. Kretchmar (2006) also noted the subjectivity between evaluators when rating admission applications, even with strict standards employed. Without an understanding of what factors of admission best predict academic success, it is difficult to know the best practices for setting admission policies and making appropriate exceptions.

Conceptual Underpinnings for the Study

The primary focus of this work was to address the key components that affect admission decisions associated with students who do not meet the standard admission requirements of a four-year, public university. To achieve this goal, the study examined three independent frameworks and synthesized them into a complementary summary of literature. The first theme was policy, in particular regard to its related political influences and context within education. The second was college retention and academic success. Major theories and significant studies related to these subjects were identified. The third component covered theories of learning and knowledge creation related to risk factors and the environment of learning associated with first year students.

The policy framework was based on the six themes of (a) process, (b) politics, (c) power, (d) specifics within education, (e) admission policies, and (f) evaluation. In particular, Fowler's (2009) stage model of a policy process was detailed. It includes six phases of a policy, from issue definition to evaluation. The model describes the policy process as cyclical in nature rather than sequential and predictable.

Additionally, the topics of college retention and academic success were explored, particularly in regard to their affect on admission standards. Astin's (1993) Input-Environment-Output (I-E-O) Model was used as a structure for defining the various elements a student provides when applying for admission to an institution. The study also

evaluated how those input variables affected output, i.e., a student's likelihood to persist beyond the first year.

Transition Theory, studied by Scholssbert, Waters, and Goodman (1995), was examined to provide an enriched understanding of additional characteristics of a student that may affect his or her perception of a college environment. This theory serves as an appropriate bridge between Astin's I-E-O Model and Tinto's Theory of Student Departure by emphasizing both the student's and university's role in creating a particular perception of the environment during the first year. It specifically focused on the psychological and social aspects of first-year students' transitional period from high school to college.

Moreover, Tinto's (1994) Theory of Student Departure, which built on Astin's model of input and environmental variables that affect a student's propensity to succeed, provided a deeper examination regarding explanations for and significance of persistence. Tinto also articulated a mutual obligation between a student and institution in this endeavor. To build upon these theories, several admission and retention models were provided, including (a) Aitken's (1982) structural model for testing multiple variables, (b) Judy's (1975) exploration of high school records and standardized test scores, (c) DeBerard, Spielmans, and Julka's (2004) examination of risk factors in regard to student success, (d) Olani's (2009) denotation of significant achievement measures, and (e) Vivo and Franco's (2007) development of the receiver operator characteristic (ROC) curve.

In regard to the students' interaction with the academic and social systems of the university, many students experience a very different environment in college than they had in high school (Astin 1993). In addition to Tinto's (1994) assertion that attaining an

environment conducive to learning is a shared responsibility of the student and college, it is also incumbent upon both parties to ensure a strong atmosphere of peer support (Astin, 2000). Scholssbert, Waters, and Goodman (1995) suggested that during this transition, students may feel uncomfortable about their capacity to succeed and question their particular role in the new experience. This phenomenon describes the marginalization of a student, particularly relating to a sense of belonging. This can affect a student's self esteem and ultimately his or her ability to succeed. Thus, the support system available to a student in a new college environment is crucial and relates to both the student's and college's ability to adjust to the new culture and progressively learn (Rayle & Chung, 2008).

An examination of both individual and organizational knowledge creation and learning was presented. Nonaka's (1994) theoretical framework of organizational knowledge creation introduced four modes of knowledge conversion: socialization, externalization, internalization, and combination. These factors of knowledge creation were closely related to the aforementioned studies regarding both student input and college environmental inputs in the first year experience.

Bruffee's (1999) explanation of reacculturation, specific to the transition from high school to college, added an additional component to Scholssbert, Waters, and Goodman's (1995) study of a college student's first year transition period. Bruffee expanded on the discussions related to social and psychological elements identified in Transition Theory by introducing the evolving social construct of knowledge and learning. Cook and Yanow's (1993) research provided further study on collective group learning, in response to simultaneous interdependent learning. Additionally, Chickering

and Kuh (2005) discussed the accommodation of a diverse learning environment for students. Chickering's (2006) study expanded on this discussion by identifying the three R's for helping student learn in a higher education environment: (a) recognize, (b) respect, and (c) respond to a broad range differences among diverse learners.

Through an in-depth analysis of the three themes of policy, college retention and academic success, and risk factors and an environment of learning, an interdependence of their application to this project was presented. Policy, while significantly affected by the influence of politics and power, was the thrust of this study. The development and application of an admission policy within higher education directly affects the strategies and practices involved in an institution's effort to influence and measure college retention and academic success. To achieve this goal, colleges and universities are focused on studying the various predictor variables and addressing experiential environment issues related to first year students. The summary of risk factors, organizational and individual learning, and reacculturation, thus, appropriately connected this theme with the models of prediction and retention that were introduced.

Statement of the Problem

Heck (2004) stated, "Policy analysis is an important, but problematic, window on the educational world because it may illuminate or obscure what it views" (p. 318). A student's potential entrance to a four-year university is initially affected by an admission policy. However, often the policy, and resultant process, lacks an integral correlation with significant predictors of academic success and retention. Policy is instead set by political agendas and at decision levels that expand beyond the university. While formal procedures are therefore created at the university level and higher, informal practices

become unclear and inconsistent to the practitioners (Fowler, 2009). Kretchmar (2006) suggested an inconsistency within these informal practices and lack of reliability in the process. Therefore, practitioners do not have dependable and credible processes to follow.

Price and Kim (1976) suggested that reliable criteria are needed to validate certain application for admission indicators of academic success. More recent studies have been employed to determine formal, and even mathematical, methods for analyzing admission data (Vivo & Franco, 2008). While demographic and academic information is collected through the admission application, the process of applicant evaluation lacks clear evidence on what determiners should be used.

Existing research also indicates a need remains for further development of a model that better identifies factors of retention and persistence, including academic success (Aitken, 1982). Much attention has been given to the importance of retention; yet, little empirical evidence exists on the variables that accurately define academic success (Astin, 1997). Thus, while empirical study of admission indicators that predict academic success are needed, additional research is also needed regarding the actual factors that best define academic success.

The transition from high school to college has been noted as a significant time of growth for a student regarding learning and knowledge. This evolution in the social construction of knowledge is defined by Bruffee (1999) as reacculturation. Tinto's (1975, 1994) academic and social integration model builds an appropriate connection between the retention models and learning theories addressed this study (Mannan, 2007). Furthermore, an understanding of how a student's involvement and performance in high

school may predict his or her preparation is lacking. In fact, research explaining admission application demographics and their possible connection to knowledge capacity does not exist. The lack of empirical evidence regarding analysis of admission policies as they pertain to predicting student success justifies the need for this study.

Purpose of the Study

According to Olani (2009), practical implications for further research on predictors of first year academic success exist. In particular, there has been little published from the paradigms of both educational policy (Burke, 2005) and the academic variables related to the transition from high school to college (DeBerard, Spielmans, & Julka, 2004), regarding predictors of academic success. The purpose of this study was to develop a further understanding of both student demographic and academic admission factors of first-time freshmen that predict academic success and retention, within the framework of policy analysis, retention analysis, and a social constructionist epistemology. The researcher chose to focus on predictors most commonly collected during the application for admission process and indicators of academic success most commonly archived at the end of the first year of college.

This study focuses on predictors of first year academic success of conditional admits at a Midwest public university. For the purposes of the project, the university under study was given the pseudonym Central State University (CSU). The four research questions developed comprehensively address four goals within the research: an analysis of (a) academic admission factors and their prediction of academic success, (b) academic admission factors and their affect on first to second year retention, (c) academic

admission factors and their prediction of academic success, categorized by student demographic factors, and (d) first year academic success with first year retention.

Research Questions

Within the framework of this study, the following research questions were proposed:

1. What academic admission factors of conditionally admitted students best predict first year academic success?
2. Are there differences between groups of conditionally admitted students based on demographic factors in their first year academic success and college retention?
3. Based on the student demographic factors that most significantly differentiate first year academic success, what academic admission factors of conditionally admitted students best predict first year academic success?
4. For conditionally admitted students, are there differences in first year academic success between students who are and are not retained from the first to the second year?

Limitations, Assumptions, and Design Controls

Included in this section are some basic assumptions of the research on academic predictors of first year student success and retention from the framework of policy analysis and learning theory. Limitations exist because of the predetermined set of variables within the dataset studied and observation of only one university. The study only informs specific types of universities based a limited characterization of the conditionally admitted student and demographics of the university studied. Additionally, the study only reviews predictors of college retention and student academic success that

are readily available items to the admission appeal committee located at the host university. The design controls of the study are discussed to sustain the findings and validity of the examination.

Limitations and Assumptions

Characteristic of any study, this project was affected by several limitations, which require proper acknowledgement. First, only one university was examined in this study. Consequently, the institutional characteristics were limited to a public, four-year, Midwest university. The represented size was also confined to one category, the Carnegie Foundation size classification of “large,” which is defined as an enrollment of 10,000 or more full-time equivalent, degree-seeking students (The Carnegie Foundation for the Advancement of Teaching, 2004). Therefore, the scope of the study was limited, constraining the ability to generalize the findings (Johnson & Onwuegbuzie, 2004).

Second, the dataset in this study was collected through convenience sampling (Creswell, 2003). Data available to the researcher were obtained, but elements supplemental to the initial collection were not obtained. Therefore, the factors submitted at the time of admission used as demographic and academic admission predictors focused only on basic demographical and academic characteristics. For instance, the dataset included variables specific to math but not other academic subject areas. It also primarily focused on characteristics used within the admission decision process but did not explore those items currently not used in the determination.

The three variables used as indicators of college retention and student academic success limited the scope of the study as well. Much research is available on factors of retention and persistence, but this study was limited to indicators of academic success of

the first year to the two elements of grade point average (GPA) and total earned credit hours after the first year, and limited college retention to the single variable of first to second year retention. Also, some subcategories of student demographic predictors were small, allowing for some question of reliability (Creswell, 2003). Furthermore, comparing the academic admission independent variables with the college retention dependent variable would have allowed for discriminate analysis, allowing for observation of the relationship between the category variable of retention and the interval predictors used to predict association to the group (Stockburger, 2008), but this was not applied.

Moreover, while a quantitative analysis was applied, one independent variable, the indicator of athletic participation in high school, required interpretation by the researcher in some cases. That is, this particular data element was collected from one of four sources: (a) within the “Extra activities and skills” section of the application for admission, (b) listed as a class on the high school transcript, (c) indicated on the letter of appeal, and (d) identified as a student athlete at CSU. Each of these instruments required some interpretation from the researcher. Additionally, it is possible the student did participate in athletics while in high school, but without any indication on any of the four sources. In this case, the student was inaccurately categorized in the dataset.

Third, existing research also provides multiple perspectives on defining retention and indicators of academic success (Astin, 1999; DeBerard, Spielmans, & Julka, 2004; Olani, 2009; Vivo & Franco, 2008). In particular, the issues of diversity and socioeconomic status within college admission decisions were not used within the framework of the study. Thus, certain motivations for setting admission policy and collecting related

application data that may affect the dataset were not discussed. Moreover, social conditions of the entering student were not included in the study, limiting the key predictors to only general demographics and academic elements.

Lastly, both the method and longitude of the study were limited. Several quantitative analyses were applied to compare variables upon entry of the conditionally admitted students with those achieved after the first year of college. However, a mixed methods approach, including qualitative study, would have introduced a richer and more comprehensive analysis (Creswell, 2003; Seidman, 2006). Additionally, the study combined three admission cohorts, fall 2006, fall 2007, and fall 2008. However, it did not take into account any unique circumstance or anomalies that may have been attributed to those cohort years. A longitudinal study of admission cohorts may yield more valid information.

Design Controls

Design controls included a quantitative research design used to determine the significant relationships between student demographics, academic admission elements, college retention, and indicators of first year academic success. This quantitative approach supported a postpositive, objective implementation of the study (Creswell, 2003). Moreover, the researcher maintained a non-partisan status, minimizing the possibility of bias (Johnson & Onwuegbuzie, 2004).

Additionally, this observational study was a cross-sectional analysis, in that it analyzed a subset of a population, all at the same time (Creswell, 2003). The scope of the project was limited, allowing for clarity among the specific elements chosen for the project. It focused on gathering information that would be useful to the university that

provided the sample, using Patton's (1997) utilization focused evaluation perspective. The results of the study were used as proposed recommendations for the formal admission policy and informal appeal committee practices.

The researcher used existing data to obtain the convenience sample. A careful exploration of the reliability and validity of the instruments used to collect the data was applied. Fink (2006) defined reliability as consistency in the yielding of results and validity as assurance that the results are correct. The application process and practices for handling the associated forms, and the student data system, ensured both reliability and validity in the independent and dependent variables of the study.

A quantitative study design, including several variations of statistical analysis, was employed, allowing for correlations between application elements and first year academic success and retention indicators to be identified. The research was submitted to and approved by the University of Missouri's Institutional Review Board (IRB). Endorsement was also obtained by the host institution's Enrollment Management Unit.

Definition of Key Terms

Several key terms were utilized throughout this study. This nomenclature is displayed and described with the intent to supply a working knowledge of their relevance to the context of this study.

ACT. The ACT is a national, standardized test, used by many colleges as a part of the admission policy and decision process (Brown, 1999; Butler, 1994; Hoover, 2009; Keller & Hoover, 2009; Hoxby, 2009; Kretchmar 2006; Nathan, 1995; Sadler, 2007). The results of the test contain a composite score and four additional sub scores, English, math, reading, and science.

Academic admission factors. In the context of this study, the term academic admission factor referred to the interval independent variables used in the analysis. The interval independent variables were a subset of the independent variables collected from the population of first-time freshmen at the time of application to CSU. The set included: GPA of completed credit prior to college, ACT composite, ACT English, ACT reading, ACT math, ACT science, class rank percentile, class size, high school GPA, number of core curriculum courses taken during senior year of high school, high school core curriculum GPA, and number of math units that meet core.

Application fee waiver. For various reasons, a student may have received a discount or waiver for the cost of the application for admission to a university. For the purposes of this study, an application fee waiver indicated that the full application fee of \$35 was removed. This action was delegated by CSU to the individual high schools. Predominant reasons for this decision were based on evidence that the student had significant financial need.

Athletic participation while in high school. This term refers to a student's involvement in sports while in high school. It was populated by reviewing information on the application for admission, high school transcript, letter of appeal, and CSU student data system.

Class rank percentile. This term refers to a student's ranking in his or her student class, divided by the total number of students in the class. For the purposes of this study, this variable refers specifically to a student's high school class.

Class size. This term refers to the total number of students in a student's particular grade level within a specific institution.

College retention. Barefoot (2004) defined retention as the propensity of a student to persist at the same institution of higher education from the first to second year. In this study, the terms retention and persistence were synonymous, although Barefoot also articulated persistence as the retention of a student for more than one year as opposed to addressing only first to second year at only one institution within higher education. For the purposes of this study, the term college retention referred to the category dependent variable used in the analysis. The category dependent variable, first to second year retention, was a subset of the dependent variables.

Conditional admit. In the context of this study, a conditional admit is a first-time freshman who did not meet the admission requirements at CSU and was therefore admitted as exception to the policy.

Core curriculum. Within the context of this study, the high school core curriculum is a set of classes that a first-time freshman applicant to CSU must have taken while in high school. The set of classes includes four units of English, three units of mathematics, three units of social studies, three units of science, one unit of a fine art, three academic electives, and additional electives to bring the total to 24 units. A unit is equivalent to one academic year. This requirement was established by the state coordinating board of CSU's host state and is required of all first-time freshmen except those who graduated from high school prior to 1996.

CSU athlete. This term refers to a CSU student who is a member of one of its authorized National Collegiate Athletic Association teams. If so, the student was coded with a respective letter to indicate the sport. This field was used to populate this category independent variable.

Earned college credit hours prior to college. Literature indicates that high school students increasingly are attaining college credit while still in high school through service programs provided most often by local colleges (Lerner & Brand, 2006). For the purposes of this study, this term refers to college credit received by the student, but specifically only while still enrolled in high school.

Ethnicity. At the point in time the data were collected for this study, a field on the CSU's application for admission was labeled "Ethnic origin." It was an optional field and included the following choices: (a) African American, (b) Asian American/South Pacific Islander, (c) European American (Caucasian), (d) Mexican American/Latin American/Hispanic, (e) Native American/Alaskan Native, and (f) Other. For clarification, the U.S. Department of Education has created a new standard for reporting ethnicity. Beginning the 2009-10 school year, race and ethnicity were separated into two separate categories (U.S. Department of Education, 2008). This standard was not in place at the time the data were collected.

First-time freshman. This term, as defined by CSU, refers to a newly admitted student with fewer than 24 transferable credit hours taken subsequent to high school graduation.

First year academic success. For the purposes of this study, the term first year academic success referred to the interval dependent variables used in the analysis. The interval dependent variables were a subset of the dependent variables, obtained from the CSU student data system after the students' completion of the first year. The set included: CSU GPA after first year of college and hours earned after first year of college.

Formal policy or procedure. The term formal is utilized as a recognition of an official process or protocol that is required in order to meet a specific task (Fowler, 2009). Typically, documentation, a diagram, or a model is associated with the policy or procedure. For the purposes of this study, the terms policy and procedure were interchangeable.

Geographic origin location. In the context of the study, the geographic origin location refers to the official home address of the first-time freshman applicant at the time of application to CSU. It was stored in the CSU application system and was coded with a: (a) three digit county code for those located within the host state, (b) two character state code for those located outside of the host state but within the United States, including territories, or (c) a three character country code for those located outside of the United States. Those codes were interpolated into one of four categories: (a) 24 county service area – those counties within a CSU defined geographical area within close proximity of the institution, (b) other county in state – those counties within the host state but outside of the 24 county service area, (c) out-of-state, or (d) another country.

Grade point average. A grade point average (GPA) is calculated by dividing the total quality points by the total hours attempted. The total quality points is equal to the institution's course grade conversion points multiplied by the hours attempted. GPAs were used for several purposes in this study. First, the high school overall GPA was obtained from the high school transcript. In cases of which the high school's GPA scale was something different than a 4.0, this GPA value was converted to a 4.0 scale to ensure consistency in the dataset. Second, the high school core curriculum GPA was calculated by the researcher and used as an independent variable. This field used the same

calculation as the overall GPA, but only included core high school curriculum classes. Third, the GPA of college credit completed by high school students prior to college was calculated by reviewing the college transcripts. Fourth, the GPA after the first year of college was retrieved from the CSU student data system.

Home school. Within this study, CSU recognizes students who receive their education through an alternative educational delivery other than the accredited high school. Because of this, an accommodation to the admission policy exists for homeschooled students. If a homeschooled student applies for admission to CSU, the high school code in the admission system is marked with a home school indicator.

Hours earned after the first year of college. For the purposes of this study, this term refers to a student's total number of college credit hours acquired after completion of the first year of college.

Informal practices. The series of negotiations which formulate a final end product of a formal policy describes informal practices (Fowler, 2009).

Letter of appeal. If a first-time freshman applicant at CSU did not meet the admission policy requirement, he or she was not from the institution's host state, and he or she also did not meet the admission policy's core curriculum requirement, then he or she could write a letter requesting an exception to the policy for review by the appeals committee. The appeal process included submitting evidence as to why the student should be considered for an appeal, including a letter from the student and reference letter from a high school counselor or another school official.

Number of core curriculum courses taken during senior year of high school. This term refers to a variable used in the study to measure the courses taken by a student

during his or her senior year of high school that met the admission policy's definition of a core curriculum course. For the context of this study, practitioners wanted to evaluate the effectiveness of a high school senior continuing to take core curriculum courses in lieu of less rigorous, non-core curriculum courses.

Number of math units that met core curriculum. For the purposes of this study, this term refers to the variable used to measure math courses, as defined by CSU, that were included in the list of courses used to meet the core curriculum section of the admission policy.

Reacculturation. Within the framework of the social construction of knowledge, reacculturation is the process of entering a new community of knowledge (Bruffee, 1999). For the purposes of this study, this term refers specifically to a first-time freshman's transition to a college.

Selective institution. CSU is categorized by its host state's department of education as a "selective institution." This designation means that admitted first-time, full-time, degree-seeking students and transfer students who have completed fewer than 24 hours must have a combined percentile score (from adding the high school percentile rank and the percentile rank attained on the ACT or SAT) that is greater than or equal to 120 points.

Sex. This term refers to a person being male or female, whereas gender refers to psychological and societal aspects of being a particular sex (American Psychological Association, 2001). For the purposes of this study, only the sex was measured. Gender was not considered.

Student demographic factors. For the purposes of this study, the term student demographic factors referred to the category independent variables used in the analysis. The category independent variables were a subset of the independent variables collected from the population of first-time freshmen at the time of application to CSU. The set included: sex, ethnicity, CSU athlete, type of high school, application fee waiver, athletic participation in high school, type of conditional admit, geographic origin location, and earned college credit hours prior to college.

Type of high school. This term refers to characteristics of the secondary school a student attended. For the purposes of this study, a school was labeled as public or private. Home school was considered as an additional category, but none of the students in the sample attended this type of school.

Type of conditional admit. The focus of this study was the admission, academic success, and retention of students who did not meet the stated admission requirements and were therefore conditionally admitted. For the purposes of this study, two types of conditional admits existed, CSU athletes and non-CSU athletes. Both types were admitted as exceptions by the admissions appeals committee. However, the academic advisement plan was different based on the type.

Summary

Ample literature exists regarding college admission policies and practices (Hoxby, 2009, Keller & Hoover, 2009), the social exchange and learning transition of a high school student to college (Bruffee, 1999; Nonaka, 1994; Upcraft, Gardner, Barefoot, & Associates, 2005), and college retention in terms of academic success (Kretchmar, 2006; Vivo & Franco, 2008). Furthermore, studies have been directed to examine unique

perspectives of indicators of academic success and college retention, within the paradigm of a particular school subject, existing survey instrument, or other topics (Kretchmar). However, little research exists in relation to common application for admission demographics compared with standard indicators of first year college retention and academic success.

This study supplemented the research literature by adding empirical evidence regarding key admission predictors of first year college retention and academic success. This information contributed to opportunities for CSU, and possibly other universities, to amend their admission policy and/or practice of reviewing appeals of potential conditional admits.

Thus, Chapter One presented the background, conceptual framework, purpose, limitations, controls, and explanation of key terms utilized to construct the study. The purpose of this study was to establish an empirical source for both policy development and practice, and interpretation regarding the admittance of first-time freshmen who do not meet the standard admission criteria. The remaining chapters provide additional insight into this study.

Chapter Two is comprised of a comprehensive review of existing literature used to constitute the study. Incorporated in the chapter is a review of policy in general and specifically how it is applied to university admissions, college retention and its relationship with academic success, and social exchange theory regarding the reacculturation of students from high school to college. Chapter Three presents the research design, data collection methodology, and explanation of analyses used to evaluate the dataset. Chapter Four encompasses a description of the quantitative findings

obtained from the data collection and analysis. Chapter Five discusses the conclusions drawn from the findings and also lists implications for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

Every year thousands of students apply for admission to public, four-year colleges and universities across the United States. The transition from high school to college is an anticipated period in life for many people. Inherent in this event are several interrelated issues. Students apply to universities and become familiar with various admission standards. Institutions of higher education develop these policies based on competing internal and external pressures. Strategies to increase, or at least maintain, enrollment are developed by universities. College retention and issues related to student academic success are significant factors in an institution's decisions regarding admission policies. In response, colleges seek to better understand both individual and organizational learning patterns, including potential risk factors of students, that take place during this transition.

Various arenas understand policy and its related concepts differently. Fowler (2009) recognized at least seven different interpretations of the term policy. Within the context of policy are several key themes, including process (Hannah, 1997), politics (Morgan, 2006), power (Bryson & Crosby, 1992), and evaluation (Cook, 2002). Each of these characteristics significantly affects college and universities in regard to setting admission policies. For instance, some influence over admission policy is from the governing state, while other pressures come from both internal and external university constituents. Additionally, policies within universities are established to help achieve enrollment and retention goals set by the institution (Kretchmar, 2006). And a by-product

of admission policies being influenced by these many factors is the event of a student not meeting the criteria and consideration of conditional admittance.

College retention and academic success are topics of broad discussion throughout the American landscape (Carey, 2005; Heldman, 2008; Lederman, 2009). Over the past 50 decades, public funding for education has dramatically decreased, while competition for students has increased (Spillane, Reiser, & Reimer, 2002). Therefore, universities seek to retain students for economic purposes while also striving to produce healthy environments for learning. Because of the strong emphasis on college retention, colleges and universities seek to find reliable indicators collected at the time of application that will predict student academic success and retention.

While studying various predictors of academic success and retention, colleges and universities recognized the existence of a shared responsibility between the student and the institution in attaining this goal. While students provided their acquired characteristics developed prior to college, universities also affected a student's likelihood of succeeding by contributing an environment conducive to learning (Astin, 1993; Tinto, 1994). To fully understand the magnitude of this matter, analyses of both individual and organizational learning, a student's reacculturation to a new learning community, and the associated risk factors have also been conducted (Bruffee, 1999; DeBerard, Spielmans, & Julka, 2004; Nonaka, 1994).

Within this literature review, three components are carefully examined. First, policy is reviewed, from a broad to narrow perspective, including the influences of politics and power, and ramifications in regard to educational policy. Second, retention and student academic success are evaluated according to three key theories, Astin's

(1993) Input-Environment-Output Model, Scholssbert, Waters, and Goodman's (1995), study of Transition Theory, and Tinto's (1993) Theory of Student Departure, and five studies about predictors of college retention and student academic success. These examples appropriately connect the subjects of university admission policies, and college retention and student academic success. Third, a review of student risk factors, organizational learning, Nonaka's (1994) theoretical framework of organizational knowledge creation, and Bruffee's (1999) explanation of reacculturation, is provided, allowing for a deeper study of inputs and environmental factors related to the analysis. These three combined frameworks create a synergistic lens from which to view the study in its entirety.

Policy

Perspectives on policy are varied, allowing for the existence of an eclectic group of definitions. Because the term "policy" is derived from political science (Almond, 1999), an inherent theme of policy is the nature of politics. Therefore, the meaning of policy is left to interpretation, based on how it relates to various coteries and ideologies. The varying definitions are influenced by entities such as society, power, and government. Many definitions of policy are political in nature and introduce a range of themes, including: (a) government, (b) political systems, (c) a public front, (d) law, (e) substantial administrative decision making, (f) consistency and repetition, (g) positions of authority and stakeholders, (h) negotiation and compromise, (i) cooperatively shared responsibility, (j) a range from enactments to practices, (k) and societal values (Fowler, 2009). Most relevant to this study is Fowler's definition of policy, "...the dynamic and value-laden process through which a political system handles a public problem. It

includes a government's expressed intentions and official enactments, as well as its consistent patterns of activity and inactivity" (p. 3-4).

Fowler (2009) discussed the contrast and blend of formal procedures yet informal practices within the realm of policy. Often the practices of an organization are less constrained than the procedures and policies that govern them. In addition to the implementation and practice of policy is the need for ongoing evaluation (Cook, 2002). The sections below introduce policy within the six themes of: (a) the process, (b) politics, (c) power, (d) policies within education, (e) university admission policies, and (f) the evaluation of policy.

Process

Policy is formed, maintained, and terminated through processes. Literature reveals that policy process is incremental in nature. For example, Hannah (1997) characterized higher education policy's incremental character with three descriptors: (a) limited by a slowly developing political culture, (b) constructed on existing and related policies, and (c) influenced by existing policy models. Based on policy's dilatory nature and reliance on precedence, the significance of key stakeholders' positional power, intention, knowledge, and skills is pertinent to ensuring desired outcomes.

Additionally, policy research, in comparison to theory-based research contains challenges, particularly regarding the nature of its cyclical pattern. Whereas theory-based research originates from specific subject areas and is dispensed back to these fields, policy-based research is action driven, beginning and returning to function (Heck, 2004). This reinforces the identified nature of policy process as being both deliberate and temperate in duration.

The anatomy of policy process is also identified by a stage model, described by Fowler (2009). The model diagrams the process of policy, including six stages: (a) issue definition – a social problem is identified as a public policy issue, (b) agenda setting – the public policy problem is placed on a list to which government officials give it attention, (c) policy formation – developed in written format, (d) policy adoption – written policy is endorsed officially by an appropriate body, (e) implementation – establishment of a statute and associated rules, and (f) evaluation – applied research to identify if the policy worked. Within higher education, policy process follows a similar model. The model helps validate that the process of policy is characterized with the reality that policy is difficult to form, cyclical, and also onerous to continue.

Politics

One perspective by which policy is viewed, especially within organizations, is as a political culture or system. Within this framework, Morgan (2006) identified three major concepts: (a) “negotiation,” (b) “coalitions,” and (c) “power” (p. 166-171). Political systems advocate a reassessment of the merit of the concept of rationality, help stakeholders to see beyond the restraints of the idea that institutions are functionally integrated systems, politicize considerations of the conduct of people in organizations, and help identify the sociopolitical overtones of various kinds of organization, such as in universities, and the roles they exercise in society (Morgan, 2006).

Political systems contain several distinctive themes. First, organizational rationality is not without politics. Rather than pursuing the importance of a rational, efficient, and effective organization as an end, political systems “emphasize that organizational goals may be rational for some people’s interests but not for others”

(Morgan, 2006, p. 209). Thus, political systems disclose the reality that rationality itself is variable, based on the perspective from which it is viewed.

A result of this reality is the emergence of negotiation among various stakeholders. Bolman and Deal (2003) discuss a political frame that proposes that organizational objectives are determined through a practice of negotiation rather than top-down directives. A successful type of negotiating, developed by Fisher and Ury, is called “principled bargaining,” which proposes four principles: (a) “separate people from the problem,” (b) “focus on interests, not positions,” (c) look for mutual benefits for both sides, and (d) “insist on objective criteria” (Bolman & Deal, p. 187-188). Hence, the politics of policy is consistent with value claiming solutions, in which better alternatives are found for both parties.

Political systems are also viewed as functionally integrated systems, revealing organizations as unconstrained groups of people with diverse concerns who gather together to achieve common goals. This perspective suggests that an organization is a coalition, comprised of smaller coalitions (Morgan, 2006). As stated by Morgan, “Coalitions arise when groups of individuals get together to cooperate in relation to specific issues, events, or decisions to advance specific values and ideologies” (p. 166). Rather than fragmentation and disagreement within the ranks, coalitions bind various stakeholders who seek to advance interests and power through the support of others.

As Bolman and Deal (2003) noted, leaders in organizations need coalitions to build support and cooperation from others. This is accomplished through cultivated relationships. Herington, Scott, and Johnson in their study of firm-employee relationship strength noted that “firms need to establish ‘strong positive relationships’ with

employees” and “the strengthening of relationships with internal constituents as being critical to a firm’s success” (Herington, Scott, & Johnson, 2005, p. 261). Moreover, Alderson and Alderson McDonnell (1994) asserted that a strong organization can be found when it is comprised of healthy, satisfying relationships between all levels of employees.

Additionally, political cultures are comprised of constituents with political motives that energize particular behaviors within organizations. Frictions between individual and organizational concerns present a consideration for individuals to function politically. Inherent in this is the desire and need for power among individuals within organizations. In addition to the structural phenomenon of power, political systems also include personalities and incentives behind both individual and organizational actions (Shafritz & Ott, 2001).

Furthermore, Bolman and Deal (2003) asserted that power is the most valuable resource within organizations. Morgan (2006) supported this claim by stating that, “power is the medium through which conflicts of interest are ultimately resolved” (p. 170). The fact that behavioral dynamics of individuals within organizations are derived through political motivations and power is an inevitable by-product.

Finally, political cultures include a sociopolitical affect on how an organization plays within society. The structure of an organization may or may not reflect the character of a society. For instance, autocratic organizations may affect democratic societies through recognition of inconsistent behaviors. Consequently, the organizational style of institutions shape communities (Bachrach & Mundell, 1993).

Power

While recognized as a component of politics, power itself is a key component of policy. It is evident through the politics of policy, but simultaneously remains independent of policy. Power is relational in nature. Based on this distinction, power can be characterized by: (a) association, (b) resources, and (c) behavior (Fowler, 2009). In order for one individual to exert power onto another, some type of connection between the characters must exist. Inherent in power is availability of prosperity, group status, and erudition. With a relationship and appropriate resources, the individual contains the ability take action that directly affects another person.

Bryson and Crosby (1992) noted a relationship of “shared power” within power relationships. In this model, individuals contain a similar level of power. The dialogue of power in this particular type of power relationship is displayed primarily through bargaining and persuasion. When power is unevenly distributed and one individual contains more power than the other, the potential for using force becomes an option. In turn, the less powerful individual may resort to resistance (Cherryholmes, 1988).

Power, of course, exists within educational politics as well. Fowler (2009) referred to the major players within education settings as actors. These actors possess different levels of power, with various types of authority and resources. The list of actors includes governance bodies, school administrators, teachers, support staff, students, parents, and the public. The types of power include: (a) economic dominance, (b) legal authority, (c) force, (d) physical, (e) psychic, (f) and persuasion. Examples of power resources are access to money, control over information, visibility, facts and figures, and access to the organization. Depending on the role of the individual, level of power, and

availability of various resources, each individual within the system will behave uniquely different than others. This relational aspect of educational politics infiltrates the policy arena.

Higher Education Policy

While policy can be defined with general terms, it also has specific characteristics within various applications. A significant establishment of policy is within education. Educational policy contains a specific history that has shaped its contemporary behavior (Leithwood & Duke, 1999), key influences such as economics and demographics (Fowler, 2009), a relation to politics through issues of governance (Heck, 2004), and a unique and balanced infrastructure (Callan & Finney, 2003).

History. Educational policy within the U.S. has evolved over the years, with a major shift occurring in the 1980's. Before this point in time, public schools were well respected institutions within the country. Prior to the 1980's and the Reagan Administration, funding for public education was abundant and authority was mostly delegated from the state to local level (Fowler, 2009). Policy was normally developed by the combination of the legislature, the state department of education, and major education lobbying groups, known as the "iron triangle" (Dorn, 2001, p. 4). Policy change within education was composed of two primary characteristics: (a) the process was laggard and deliberate, and (b) educators were considered experts and their opinions were held with high esteem (Fowler, 2009).

Beginning with the 1980's, a period of time which emphasized educational reform was emphasized (Wilson, 2009). In this "new" environment, educational policy has inversely changed. Education is generally no longer viewed as stable. In response,

proposals for change are significant, including recommendations for profound alterations. Additionally, school districts are often in financial distress. More often schools are challenged with direct competition and market pressures. The distribution of authority to local levels also has been significantly affected. Fowler (1999) articulated, “State governments asserted their authority over public schools by using a bewildering array of new policies and policy proposals” (p. 8).

Coupled with a removal of authority from public school administrators, the previous esteem granted to local educators transitioned into a lack of confidence. Rather than the expert with cogent answers, educators started being viewed as a significant contribution to the problems within education. Empowerment in the form of distribution of powers (Hackman and Johnson, 2000) and enablement (Jablonski, 2000) was essentially expelled from local educators. This transformation resulted in a political environment of bitterness and passivity among educational leaders (Fowler, 2009). Educational policy today remains in a culture of economic and demographic challenges.

Economy and demographics. Fowler (2009) asserted that while effects on change in education policy are complex and multifaceted, economic changes throughout the world have played a significant role. Heck (2004) even recognized economics as a conceptual framework for viewing educational policy. And Callan and Finney (2003) asserted the affects of economic conditions as a “daunting task” (p. 4) in the context of policy creation and redesign. In 2003, Chickering (2003) asserted that “higher education faces new financial realities together with escalating demands for more accountability” (p. 38).

The current climate of education, from an economic standpoint, is in a mode of crisis. The economy of education has shifted with history as well. Several significant economic phenomena have taken place to affect the environment of education. Subsequent to World War II, much of the world experienced nearly 30 years of economic growth. In the mid-1970's this culture became inverted and economies stale. During this time, the political environment influenced the public economy. Politicians were reluctant to support taxes at the current levels and certainly did not endorse tax increases (Popkewitz, 2009). The result was diminished spending on public programs. This change in public spending did not adjust even after an improvement in the economic climate in the 1990's (Popkewitz).

Meanwhile, economic disparity between the rich and poor grew. While in the 21st century a larger number of children grew up in poverty (Wikeley, Bullock, Muschamp, Ridge, 2009), schools were left with the responsibility of economically supporting these constituents. Fowler (2009) noted, "Educating poor children well is costlier than educating those whose families have abundant or adequate resources" (p. 9). Schools were taking a double hit, less public funding and higher expenses (Popkewitz, 2009).

Correspondingly, another external factor that affected higher education was the Civil Rights Movement of 1954 to 1965. A primary objective of the initiative was to remove formal barriers that obstructed African Americans from participating in all entities of the public arena (Brown, 1994). Specific to higher education, prior to 1968, African American students, for example, attended historically black colleges in order to obtain a degree. Subsequent to 1968, African American students attended colleges of a non-minority majority to earn a degree. This change was the result of several landmark

events. In 1954 the Supreme Court's decision in *Brown vs. the Topeka School Board* illegalized racial segregation in public schools. Thus institutions of higher education could no longer use race as a determiner in admission decisions. The Civil Rights Movement also indirectly affected policies regarding federal financial aid programs (Allen, 1992).

Also, the 1965 Higher Education Act generated significant implications regarding the support of low-income students. While prior to 1965 federal financial aid policies awarded colleges and universities, but not students, subsequent to 1965 financial aid was awarded directly to the individual student. This instituted new policies and programs, such as the Pell Grant, Supplemental Educational Opportunity Grants (SEOG), and College Work Study. Therefore, many low-income students who could not previously consider attending college were able to earn a degree. Additionally, the college choice for these students expanded to better match that of their more financially advantaged counterparts (Gerald & Haycock, 2006).

Furthermore, programs, such as Upward Bound, Talent Search, or Urban Scholars Program, to help low-income students apply to and succeed at public institutions were developed. Because the federal financial aid programs were open to all students, this created an influx of low-income and first generation students attending selective public institutions. These programs were partly in response to the recognition that the new college environment for these students was different, according to their academic, geographic, and cultural background, than traditional students. Many of the policies and programs regarding the conditional admittance of students were developed at this time, in

response to the incursion of low-income and first generation students (O. G. Brown, personal communication, April 16, 2010).

Changes in demographics during this period have affected the economy of education as well. The change in population diminished the pool of funding for education in two significant ways: (a) competing budget priorities because of funding needed for the retirement of Baby Boomers and (b) less economic support from a significant portion of the population. Thus, the transition of Baby Boomers moving to retirement has significantly affected the economy of education (Hunt, Tierney, & Carruthers, 2006).

Another demographical change in the United States is the increase in diversity and shift to a multicultural society. This phenomenon directly impacted the educational policy environment. Multiculturalism, including ethnicity, race, religion, and language have influenced the workings of public schools and considerations for educational policy decisions (Rosenblatt, 1996). Consequently, even more new demands have been placed on public schools.

Governance. Public policy simply is non-existent without some form of governance. Education policies have shifted over the past few decades from primarily a local and state governed system to more governance held by the federal government (Fowler, 2009). Heck (2004) described this as “federalism” and stated that “State and local governments act as policy institutions within the larger federalist system” (p. 120).

Therefore, policy development often takes place at the federal level, while state and local bodies are expected to interpret, implement, and enforce those policies. However, Spillane, Reiser, and Reimer (2002) identified an ongoing contrariness between maintaining local governance versus pushing for federal control – “During the

past 50 years of educational policymaking, this dialectic of requiring change and allowing for local autonomy has played itself out” (p. 387). Thus, some confusion exists regarding the place for creation and sustainment of public policy.

Infrastructure. Also, effective policy infrastructure is a key component of educational policy. Callan and Finney (2003) described this phenomenon as a framework that “would set clear goals and use incentives to leverage change...including accountability, public finance, and governance” (p. 4). Infrastructure can also be designated at various governing levels, requiring a balance between the interests of the state and public and also the interests of education institutions (Callan & Finney).

Spillane, Reiser, and Reimer (2002) asserted that developing a framework for policy is completed in three stages, taking into account how individuals notice and interpret the issues at hand, considering the situation and context, and understanding the role of external players. Effective policy infrastructure recognizes all three components – internal stakeholders, content and context of the issue, and external constituents.

Admission Policies

Many public, four-year universities receive thousands of applications for admission from potential first-time freshmen every year. In order to practically manage the processing of each application in an efficient manner, colleges develop quantifiable methods for summarizing student resumes and making appropriate admission decisions (Kretchmar, 2006). The routine of evaluation is multifaceted in nature and is also resultant in many challenges for policy makers to consider. These themes include: (a) writing formal policies, (b) developing informal practices to implement the policy, (c) selectivity levels, (d) diversity standards and pressures, (e) deliberating possible

exceptions to the standards, (f) considering the role of student athletes, and (g) determining those characteristics of students that best predict success at college.

Formal admission policies and selectivity levels. Most public, four-year universities have specific admission requirements for entrance to the school. The policy that defines these requirements is most often developed by the local institution, but contains characteristics established at a higher political level, such as the state. In some states, the department of education has developed a scale of selectivity. For instance, the state most coupled with this study recognizes four categories of selectivity, each with specific requirements: (a) highly selective, (b) selective, (c) moderately selective, and (d) open enrollment. Each school within this state is able to choose a level. However, if students are admitted as exceptions to the requirements of a particular level, they are expected to perform academically at a similar level to those students regularly admitted.

The exclusivity of universities has become a wide topic of debate across the United States (Brown, 1999; Butler, 1994; Keller & Hoover, 2009; Nathan, 1995). However, literature shows that most students are successful in their application quest. Hoover (2008) noted that in 2007, 80% of first year students were successfully admitted to their top choice, and the national average acceptance rate was close to 70%. While pressures from state and federal levels have increased, college acceptance rates have changed very little since educational reform in the 1980's (Hoover). Hoxby (2009) supported this in her study of selectivity in American colleges by noting that over the past 50 years, while the top 5% of colleges have become more selective, most colleges have not become more selective.

Literature further addresses the issue of the adoption of admission policies (Illinois State Board of Higher Education, 1995) as the challenge of quantifiably measuring student application characteristics to support the admission policy and selectivity level of the institution. Kretchmar (2006) noted significant challenges in evaluating applications. Because of high volumes of applications and limited human resources, quantitative rating scales (see Figure 2) are used to process applications efficiently. Scales are built based on concrete scores collected during the application process, such as standardized test scores, high school GPA, high school class rank percentile, number of subject area courses taken, and more. To address this challenge, research based on theories and strategies for measuring application elements has been conducted (Jeon, 2009; Vivo & Franco, 2008). More information on these studies, and their relationship to predicting academic success in college, is addressed later in this chapter.

Studies have looked at several key components of the demographical and academic admission data collected at the time of application (Brown, 1999; Nathan, 1995; Sadler, 2007). These pieces include standardized test scores, obtaining college credit while in high school, participation in collegiate athletics, distance from home, and performance within specific subject areas.

Hoover (2009) asserted that admission criteria specific to numbers were used to predict enrollment outcomes and simplified the application evaluation process, but were given an undeserving amount of weight. Wake Forest University actually removed the requirement of standardized test scores, replacing the input with a personal interview of the student. Additionally, Brown (1999) noted that focus on standardized test scores for

Selection Index

If you successfully complete the high school core curriculum before graduating from high school and meet **any one** of the following criteria, you will be **automatically admitted** to Central State University:

- ACT score of 24 or higher (SAT 1110)
- 3.5 cumulative GPA on a 4.0 scale
- Rank in the top 25 percent of your graduating class

Applicants who do not meet one of the automatic admission criteria listed above, but who have successfully completed the core-curriculum requirement before graduating from high school, can still be admitted if they meet the requirements as laid out in the sliding scale below:

How to Use This Scale									
STEP 1: Using your class rank percentile and GPA, determine which will place you higher on this scale. For example, if your class rank percentile is 60 and your GPA is 3.30, you would use the line based on your GPA. If your school does not rank, your GPA will be used to determine your eligibility.					STEP 2: Follow the line you identified in Step 1 across the scale to determine the minimum ACT or SAT score you must have*. Using the same example from Step 1, a student with a class rank percentile of 60 and a GPA of 3.30 would need either an ACT composite of 19 or higher or an SAT total of 910 or higher.				
	Class Rank Percentile	or	GPA			ACT Composite	or	SAT Total**	
	75 or higher		3.50 or higher			<i>No minimum test score required for admission purposes.</i>			
	73 to 74		3.48 to 3.49			18		860	
	64 to 72		3.25 to 3.47			19		900	
	56 to 63		3.04 to 3.24			20		940	
	48 to 55		2.85 to 3.03			21		980	
	40 to 47		2.63 to 2.84			22		1020	
	34 to 39		2.48 to 2.62			23		1050	
	Below 34		Below 2.48			24		1090	

Figure 2. Representation of CSU’s Selection Index and Sliding Scale Portion of the Admission Policy. Reprinted by permission of Central State University.

college admission purposes identifies only those students who perform better on tests, not necessarily those who are smarter and more committed to the institution.

Secondary-Post-Secondary Learning Options (SPLOs) are objectives that have been set by educational policy makers to study the curricular links between high school and college (Lerner, 2006). Lerner’s compendium on SPLOs specifically studied the

phenomenon of high school students earning college credit while in high school. Two particular issues identified in the project are especially relevant to this study. First, questions exist among the university level regarding the transferability of college credit hours taken while in high school. However, Lerner acknowledged many institutions use the application element as a determiner of admissibility. Second, Lerner also noted that college classes taken during high school were not as rigorous as college classes taken at the college level and therefore may place a disproportionate amount of weight on college credit as a key determiner in admission decisions.

Policy makers at universities also face external political pressures regarding the admission of athletes. Hill, Burch-Ragan, and Yates (2001) identified a reform in the 1990's in response to perennial problems in college sports. Economic and competitive expectations regarding college athletics greatly influenced both the development of formal admission policy and implementation of associated informal practices. Both processes resulted in more relaxed admission standards being applied to university athletes (Zimbalist, 1999).

While little research exists on general demographics of students collected in the admission process, Hoxby's (2009) research on selectivity in American universities highlighted the demographic of distance from home. The study displayed a trend in "increased elasticity of preference" (Hoxby, p. 2) among college applicants. In particular, students are much less motivated by distance as in the past, that is, the preference of close proximity to home has substantially decreased.

Vivo and Franco's (2008) study of predictors of academic success identified the exploration of performance within particular subject areas and its relationship to success

or failure of first year college students. In particular, the researchers noted that mathematics is a common difficulty for students, to the point of raising absenteeism and failure rates. Thus, success in mathematics is used by some universities as a standard for admission, implying that success in this subject indicates even potentially higher success rates in other subjects (Vivo & Franco). However, additional research does not indicate empirical evidence for emphasizing performance in mathematics as an admission determiner. In fact, these studies have displayed limited consistency in studying any particular subject area (DeBerard, Spielmans, & Julka, 2004; Olani, 2009; Vivo & Franco).

Conditional admits. Resultant of the various admission policies and standards set by four-year, public universities, and mandates set by the governing states (South Carolina Commission on Higher Education, 2007), colleges face the challenge of implementing policy and decisions for those students who do not meet the set admission requirements of a particular college. Besides certain standards set by governing agencies or institutional goals, very little guidance in regard to best practices about admission exception policies is available for universities to follow.

Evaluation

For policy to persist appropriately, it is evaluated, altered if needed, and reenacted. Evaluation, in general, allows policymakers to distinguish the effective value of policies, and initiate new or amend existing ones to achieve particular objectives (Rossi, Lipsey, and Freeman, 2004). Policy significance, described by Rossi, Lipsey, and Freeman, is pertinent to the action of policy evaluation. If the evaluation lacks focus on the value of the policy and related issues, then it provides only inessential information.

Thus, the effective application of policy evaluation is crucial to the validity of the evaluation itself.

The research approach and methods in evaluation are determiners in its effectiveness. Evaluations can be conducted within an organization or by an outside consulting firm. In addition, several methodologies may be used in policy evaluation. Quantitative designs “involve the collection and statistical analysis of numeric data” (Fowler, 2009, p. 17). Qualitative approaches comprise the assemblage of expressed or illustrated data. Holistic evaluations include a mixture of elements from both quantitative and qualitative approaches. Rossi, Lipsey, and Freeman (2004) articulated that both the beginning of the process, developing research questions, and the end, interpreting the findings, are often identified as the weaknesses of ineffective evaluations.

Assessment is certainly applied within higher education. For example, in their study on providing multiple pathways to higher education, Callan and Finney (2003) asserted evaluation and accountability should be based on a careful diagnosis of the context, public monitor of changes over time, and disaggregation of results to identify problems and create improvements.

Policy, the primary conceptual emphasis of this project, is a relevant and significant issue to address. Through describing the process of policy, the various actions involved in creating a final product were highlighted. Two key external forces significantly influence the nature and outcome of policy development, politics and power. Specifically within educational policy, important historical events have permanently affected the direction and nature of policy within higher education. Accordingly, because

of policy's cyclical nature and susceptibility to change, effective and periodic assessment is necessary.

Academic Success and Retention

Explanations of student success, as noted in Table 1, tend to vary, driven by multi-dimensional concepts and meanings (Hunter, 2006; Kuh, Kinzie, & Buckley, 2007). Upcraft, Gardner, Barefoot, and Associates (2005) provided a comprehensive definition, including the following characteristics: (a) developing intellectual and academic competence, (b) establishing and maintaining interpersonal relationships, (c) exploring identity development, (d) deciding on a career, (e) maintaining health and wellness, (f) considering faith and the spiritual dimensions of life, (g) developing multicultural awareness, and (h) developing civic responsibility. Kuh, Kinzie, and Buckley, similarly, noted indicators of students success, which can be summarized into seven categories: (a) readiness for college, (b) acceptance to college, (c) engagement in college, (d) persistence in college, (e) achievement in college, (f) satisfaction with college, and (g) attainments after college (Sell & Levesque, 2008).

While institutions in higher education attempt to address all areas of academic success, limited resources make it challenging to operationalize all areas. Therefore, most colleges refine their focus on a more succinct definition of student success: (a) successful completion of courses with an acceptable grade point average, (b) continued enrollment into the second year, and (c) development of the higher-order intellectual skills necessary to become an educated person. Upcraft, Gardner, Barefoot, and Associates (2005) summarized this approach:

Table 1

Explanations of Student Success

Source	Definition
Upcraft, Gardner, Barefoot, and Associates' (2005) comprehensive definition of student success	<ul style="list-style-type: none"> (a) developing intellectual and academic competence, (b) establishing and maintaining interpersonal relationships (c) exploring identity development (d) deciding on a career (e) maintaining health and wellness (f) considering faith and the spiritual dimensions of life (g) developing multicultural awareness (h) developing civic responsibility
Sell & Levesque's (2008) summary of Kuh, Kinzie, and Buckley's (2007) categories of student success	<ul style="list-style-type: none"> (a) readiness for college (b) acceptance to college (c) engagement in college (d) persistence in college (e) achievement in college (f) satisfaction with college (g) attainments after college
Upcraft, Gardner, Barefoot, and Associates' (2005) succinct definition of student success	<ul style="list-style-type: none"> (a) successful completion of courses with an acceptable grade point average (b) continued enrollment into the second year (c) development of the higher-order intellectual skills necessary to become an educated person

Although all the other dimensions of student success are important to educating the whole student, most colleges and universities verify directly only two parts of this definition. That is, if students earn the required number of academic credits with a minimally acceptable grade point average, they are awarded a degree. With the exception of gross violations of accepted institutional codes of conduct, most institutions...restrict their judgments about students' degree worthiness to the academic criteria described above. Furthermore, although most institutions would claim credit for the development of higher-order intellectual skills, these skills are seldom verified independent to course grades. (p. 28)

Student academic success has been a long standing priority among colleges and is focused primarily on the retention of first year students and continuance to a successful graduation at the institution of original enrollment. The emphasis of attention to first year retention was noted by Winston and Sandor (1994) as primarily motivated by both enrollment challenges and changing college populations. Bean (1996) noted economic, ethical, and institutional conditions as influences of concern regarding college retention. With colleges primarily focusing efforts on increasing academic success through limited measurements and addressing issues of first to second year retention (Astin, Astin, Chopp, DelBanco, & Speers, 2007; Braxton, Hirschy, & McClendon, 2004), universities are focused on finding effective models of college retention and predictors for first year academic success.

Models of College Retention

Universities continue to research how students develop during their college years (Sanford, 1967). With the emphasis on first year student success, colleges are examining

both how and why students remain in school or leave. Consequently, the capsulization of higher education has been introduced to a plethora of theories and research, including many models related to college involvement and success (Astin, 1993; Braxton, 2000; Kuh, Kinzie, & Buckley, 2007; Pascarella , 2006; Pascarella & Terenzini, 2005; Scholssbert, Waters, & Goodman, 1995; Tinto, 1994).

Three of these models include Astin's (1993) Input-Environment-Outcomes Model, Scholssbert, Waters, and Goodman's (1995) study of Transition Theory, and Tinto's (1993) Theory of Student Departure. In Astin's model, a comprehensive discussion on the various factors a high school student carries forward into college, and the array of determinants that affect this student during the first year of college, is introduced. Transition Theory also focuses on this adjustment from high school to college, with a deeper study of the psychological and social aspects of the process, particularly related to the campus environment. Tinto's theory, like Scholssbert, Waters, & Goodman, also focused on the environment perspective of Astin's model, with an extensive focus on the meaning of each factor.

Astin's Input-Environment-Outcomes Model. This model is known as one of the first endeavors to describe and observe college retention. Astin's (1993) model of input-environment-outcome was built on the basic premise that the success of a student is based on both "who students were before they entered college and what happened to them after they enrolled" (Upcraft, Gardner, Barefoot, & Associates, 1995, p. 30). Thus, this model evaluated the various academic and environmental variables a student experienced prior to and during college. Astin's model was based on a longitudinal research project, of

which he evaluated approximately 24,500 first-time freshmen who attended a four-year college.

The first premise of this model was that students enter a college with preset conditions and experiences, which Astin (1993) labeled as “inputs.” These various characteristics influence a student’s perspective broadly on life and more narrowly on college. Astin selected 146 possible input variables. Included in this set were academic admission measures, such as standardized test scores and high school grades.

Additionally, the slate included demographical characteristics, such as ethnicity, race, age, gender, marital status, religious preference, income, parent level of education, and preference for attending college (Upcraft, Gardner, Barefoot, & Associates, 1995). Astin (1993) noted that the consideration of input variables was for the purpose of better understanding students’ backgrounds and establishing indicators regarding their ability to persist in college.

The second premise of Astin’s model, environment, took into account primarily two issues. The first was time sensitive, establishing that the student was observed for this phase of the model after beginning college. The second was the observance of environmental variables within the college experience that might help predict student success. Astin recognized 192 environmental variables, which he categorized into eight themes: (a) institutional characteristics, (b) students’ peer group characteristics, (c) faculty characteristics, (d) curriculum, (e) financial aid, (f) major field of choice, (g) place of residence, and (h) student involvement. Influences of student success observed through this section of the model included a student’s socioeconomic status, academic preparedness, type of living environment, hours spent studying, and participation in

extracurricular activities. It also included university characteristics, such as campus environment, instructor teaching methods, and the ability to provide grants and loans.

Additionally, in regard to the second letter of the model, many students experience a very different environment in college than they had in high school (Astin 1993). During this transition, students may feel uncomfortable about their capacity to succeed and question their particular role in the new experience. This phenomenon describes the marginalization of a student, particularly relating to a sense of belonging. This can affect a student's self esteem and ultimately his or her ability to succeed. Thus, the support system available to a student in a new college environment is crucial and relates to both the student's and college's ability to adjust to the new culture and progressively learn (Rayle & Chung, 2008).

The third premise of the model, outcomes, focused on the evaluation of student characteristics after exposure to the college environment. As Astin (1993) stated,

Change or growth in the student during college is determined by comparing output characteristics with input characteristics. The basic purpose of the model is to assess the impact of various environmental experiences by determining whether students grow or change differently under varying environmental conditions. (p.

7)

Astin recognized 82 outcomes and categorized them into the five areas of satisfaction with the collegiate environment, academic cognition, career development, academic achievement, and retention.

Astin's (1993) three part model introduces a theoretical approach to evaluating the various factors that influence college retention and academic success prior to and

during the first year of college. In correlation with other models, a roadmap for identifying specific predictors applicable to admission policies is provided. However, a challenge with the Input-Environment-Output Model is the ability to sift through the many elements and identify the significant and relevant variable(s) to be addressed and further assessed (Astin).

Scholssbert, Waters, and Goodman's Transition Theory. Building on Chickering and Reisser's (1993) seminal work on the seven vector model, Scholssbert, Waters, and Goodman (1995) developed a study that added integral perspicacity to the theory. The focus of the study was set on a recognized time of change; that is, moving from high school to college. Transition Theory looked primarily at the psychological and social aspects of how experiences change a student's life. These changes were summarized into four categories: (a) experiences of the individual, (b) confidence indicators, (c) acknowledgment and understanding of life roles, and (d) issues pertaining to significance and a sense of belonging (Rayle & Chung, 2008).

Transition Theory is useful to policy makers in higher education because of its focus on the first year of college. It evaluates stress factors and a student's need for significance, correlating the latter with more of a likelihood to persist. In this model is the premise that students view the move from high school to college as a transition, and one for which they should anticipate and prepare. Additionally, the transition is recognized both as a general concept and day to day application. Success is directly tied to the availability of resources to the student and the students' ability to manage the stresses of the transition. The student's ability to address these challenges is divided into four categories: (a) situation, (b) self, (c) support, and (d) strategies.

Situation includes the conceptual factors that describe a student's understanding of the transition from high school to college (Evans, Forney, & Guido-DiBrito, 1998). Self refers to personal, demographic, and psychological factors that may shape a student's likelihood to enter a college. Support is comprised of the social aspect of the student, including relationships and social networks available during the time of transition. And strategies include those techniques acquired by the student as methods for coping with the stresses related to the transition (Scholssbert, Waters, & Goodman, 1995).

Transition Theory, therefore maintains a short-term focus on the transition from high school through the first year experience in college. It specifically highlights those environmental characteristics that influence a student's ability to manage the changing circumstances of the transition from high school to college. Students who capitalize on the transition manage to more successfully adjust to the changing environment (Evans, Forney, & Guido-DiBrito, 1998)

Tinto's Theory of Student Departure. Tinto's (1993) theory was built on several studies, but primarily enhanced the work of Spady (1970), who depicted the essence of the various relationships between the factors that compel student persistence. This approach allowed for focus on the particular explanations for, significance of, and conciliatory aspects of persistence, a component that Astin's (1993) Input-Environment-Output Model did not interrogate (Tierney, 2000). Tinto denoted the existence of a shared responsibility between the student and institution regarding a student's ability and choice to remain at or leave a college. Pertinent to this argument was the premise that students

form a perception of their self status at a college, and universities are responsible for helping this perception to best match their desired reality (Tinto).

Students enter college with various characteristics and skills that affect their commitment to educational goals and the institution. This commitment increases or decreases based on the quality of the academic and social experiences. Integration occurs as a result of positive and rewarding experiences. Greater integration results in even higher retention rates (Tinto, 1994). Pascarella and Terenzini (2005) expanded on this by asserting that negative experiences minimize integration, leading to distance between the student and institution, and ultimately leading to departure.

The end result of Tinto's work was very similar to Astin's model. That is, characteristics that students acquire prior to college and carry with them, in coordination with both academic and social experiences during college, contribute to their overall academic success, particularly during the first year. Upcraft, Gardner, Barefoot, and Associates (1995) ascertained from Tinto's work that "more careful attention to who is admitted and to the creation of a collegiate environment that is conducive to student persistence once students are enrolled" (p. 31) is imperative.

Predicting Academic Success

Upcraft, Gardner, Barefoot, and Associates' (1995) in-depth study of the first year of college provided a comprehensive synthesis of literature regarding variables of academic success and college retention. In particular, the researchers identified categories of variables based on Astin's (1993) Input-Environment-Output Model. The groupings were labeled (a) student input variables, (b) institutional variables, and (c) environmental variables (Upcraft, Gardner, Barefoot, & Associates).

Student input variables identified those characteristics of students' backgrounds that were acquired prior to college. They were academic and demographical in nature, including prior academic achievement, socioeconomic status, gender, age, race/ethnicity, parents and other family, and student commitment to a degree (Upcraft, Gardner, Barefoot, & Associates, 1995). These factors were used to estimate what precollege characteristics were best predictors of college retention and student academic success.

Institutional variables were derived from Astin's (1993) assertions about the significance of institutional characteristics and environments, and Tinto's (1993) focus on institutional responsibility in the developed positive perceptions of a first year student. The set of variables was comprised of selectivity, institutional type, size, public or private control, gender composition, and racial composition (Upcraft, Gardner, Barefoot, & Associates, 1995). These factors were used to measure an institution's ability to be more contributory toward college retention and academic success than others.

In addition to Upcraft, Gardner, Barefoot, & Associates' (1995) composition, further research and study (Aitken, 1982; Judy, 1975; DeBerard, Spielmans, & Julka, 2004; Olani, 2009; Vivo & Franco, 2007) has been applied specifically regarding the topic of identifying factors that predict student success during the first year of college. Following are five recent studies that, in particular, tend to be frequently reviewed and applied, and also represent the multitude of perspectives and areas of focus taken by the researchers.

Structural model. Aitken's (1982) study, originally applied prior to Upcraft, Gardner, Barefoot, & Associates' work, presented a comprehensive model of student adjustment in college and retention, from a structural perspective. Aitken built upon the

work of Spady (1970) and Tinto (1975), which identified variables that affect college retention. The work expanded single variable equation theories into a mathematical formula supporting multiple variables of retention, and also developed a formal-structural model as opposed to a limited test of association between variables. The structural model provided by Aitken expanded Spady and Tinto's list of retention variables and identified "where in the institutional structure the variables have their major impact" (Aitken, p. 33).

High school record vs. standardized tests. Judy (1975) theorized that a student's high school record was a better predictor of achievement in college than standardized test scores. Judy observed, however, that standard admission practices of universities took test scores into greater account. The research provided evidence that narrow focus on the areas of standardized test scores, high school GPA, or high school class rank did not contribute adequate predictions in student academic success as it pertained to grades. Judy recommended the development of a mathematical high school transcript matrix score to better predict college achievement.

Risk factors associated with success. DeBerard, Spielmans, and Julka's (2004) study focused on the risk factors associated with predictors of first year college success. The thrust of this study was the dichotomous association between those students who were able to successfully manage the transition from high school to college and those who failed to complete their first year of college. The study included 204 undergraduate students from introductory psychology and sociology classes at a private, coastal university.

Linear regression analysis was used to measure ten predictors of cumulative GPA and retention. The findings indicated significant correlations between the ten predictors and cumulative first year GPA. However, only a single predictor was moderately correlated with retention. This study presented the potential to predict a large amount of variance in freshman year cumulative academic achievement. The model conclusively identified students at high risk of subpar academic performance during their first year of college.

Academic achievement measures. Olani (2009) developed a study motivated because of the predominant existence of premature withdrawal from universities and academic failure of students. The study entailed detailed evaluation of factors that predict academic success in universities. Both academic achievement measures and psychological variables were collected and analyzed. A forward linear regression analysis was run to determine what variables, and to what degree each variable, predicted first year GPA.

The findings indicated that, in combination, prior academic achievement measures and psychological variables accounted for 17% of the variance in students' college GPA scores. The solitary contribution of psychological variables was 4%. The results of the study verified that academic performance prior to college was indeed a predictor of GPA at a college level. The psychological variable results were not as conclusive but did provide some practical implications regarding the provision of specific university services.

Receiver operator characteristic (ROC) curve. Vivo and Franco (2007) sought to develop a standard measure for predicting academic success. Using statistical decision

techniques, they created the receiver operator characteristic (ROC) curve. Through this model, the curve is used to analyze the accuracy of predictors and "...to compare and interpret the relative contribution of each university entrance factor in the correct classification as success or failure of the academic performance, as well as to establish cut-off scores for admissions and counseling purposes" (Vivo & Franco, p. 325). In particular, it was used to evaluate the potential of input variables and their ability to predict academic success or failure in specific academic subject areas.

The two subject areas were Economy and Business Administration. Economy included the sub academic areas of Quantitative Methods for Economy I, Quantitative Methods for Economy II, Introduction to applied statistic for economy, Economic Statistic I, Economic Statistic II, Optimization techniques, and Dynamic systems. Business Administration included the sub academic areas of Quantitative Methods for Business I, Quantitative Methods for Business II, Introduction to applied statistic for business, Applied statistic for business I, Applied statistic for business II, Complements of quantitative methods. Through the analyses, the study classified the students in these classes as a success or failure based on predetermined definitions.

The findings of the example used in the study revealed conclusive results for four predictor variables. When applied to the subject areas of Economy and Business Administration, the "grade of the general part in the university entrance examination" was a poor predictor except in one sub academic area. In all other sub academic areas, "mean grade in the secondary school," "weighted grade of the secondary school," and "university entrance examination" were statistically better predictors. These three variables were also poor predictors for three other major academic subjects. The study

concluded that the ROC analysis does allow universities to define reliable entrance requirements pertaining to specific academic subjects.

College retention and student academic success are two major issues that colleges and universities constantly address and which significantly affect policy. Astin's (1993) Input-Output-Environment Model, Scholssbert, Waters, and Goodman's (1995) explanation of Transition Theory, and Tinto's (1993) Student Departure Theory collectively address the key areas of precollege inputs and in-progress college environment factors that predict college retention. Moreover, institutions within higher education have applied research to and studied models that statistically analyze these variables to support the goal of predicting academic success. Within these studies is also the goal of accurately predicting variables that best define student success.

Risk Factors and an Environment of Learning

The study of academic success and college retention appropriately build on the policy analysis of university admission standards. Likewise, evaluation of the transition of first year students in the context of learning is strongly associated with the environmental factors articulated in the review of retention and prediction models. Regarding a student's transition from high school to college are inherent issues pertaining to the social construct of a student's frame of reference, knowledge creation and development of both the student and college, and potential risk factors, especially in regard to those students deemed less prepared for college. A student enters college with a particular social construct, i.e., inputs, for learning (Bruffee, 1999). The various factors involved with the first year college experience, i.e., environment, play a significant role in the successful or failed development of a student. Therefore, a review of the previously

discussed themes and synthesis of literature as it pertains to risk factors, and knowledge and learning is provided.

Risk Factors

Much attention has been focused on the risk factors of first year college students, especially in regard to academic success and retention, yet little empirical evidence exists regarding the specific factors that may negatively contribute to a student's ability to learn and succeed at a university. In fact, while much of the research noted in this study is used by colleges to help improve retention rates, less focus is placed on reasons for attrition (Sadler, Cohen, & Kockesen, 1997). Much of the research on attrition (Allen, 1997; Boughan, 1995; Sadler, Cohen, & Kockesen; Zhang, Chan, Hale, & Kirshstein, 2005) emphasizes categories related to student risk factors. These factors relate to the internal and external components of learning and knowledge.

Therefore, the body of research regarding risk factors to be considered at the time of application to a college provides only anecdotally-based assessment. Several studies, however, have emphasized two categories related to risk: (a) low placement test scores (Boughan, 1995) and, (b) a disadvantaged background (Zhang, Chan, Hale, & Kirshstein, 2005). In particular, Boughan noted high risk for those students categorized as academically unprepared. This factor was highlighted by a student's need for remediation in one or more subjects.

Allen's (1997) study of college retention examined the impact of precollege variables specific to high risk first-time college freshmen. In this analysis, Noel Levitz' College Student Inventory (CSI) was used to identify students deemed as at risk for dropping out prior to completion of the first year. Sadler, Cohen, and Kockesen's (1997)

model was used to predict at risk students in New York, however, primarily concluded that the objective to simultaneously measure retention and identify at risk predictors is complicated, especially when taking into account overall accuracy, and therefore needs further development.

DeBerard, Spielmans, and Julka's (2004) work on predictors of academic achievement and retention provided a longitudinal perspective on the stressful transition during a student's freshman year in college. The model developed was successfully used as a proactive tool to identify students at high risk, with a propensity for poor academic performance during their freshman year. However, most of these indicators were substandard social behaviors, not precollege academic performance.

Consequently, literature (Allen, 1997; DeBerard, Spielmans, & Julka, 2004; Sadler, Cohen, & Kockesen, 1997) indicates that risk factors play a significant role in the outcome of college retention and academic success. However, only limited research and study are available in terms of (a) identifying specific risk factor indicators, (b) using risk factors to predict success or failure, and (c) finding quantifiable risk factor variables. While some narrow findings in regard to risk factors are helpful, a broader scope and ability to provide empirical evidence is lacking.

Knowledge and Learning

Effective learning by both the college and student is a requisite to successfully addressing the environmental factors associated with the first year experience of a college student. A number of theories exist regarding learning and knowledge (Bartell, 2003; Bruffee, 1999; Cook & Yanow, 1993; Davis, 2003; Mezirow & Associates, 2000; Nonaka, 1994) both at an organizational and individual level. College retention is directly

affected by organizational and individual learning. Therefore, both organizational and individual learning theories are addressed below.

In regard to organizational learning, collective group functionality is the objective, rather than merely a blend of independently existent individuals (Cook & Yanow, 1993). Mezirow defined this concept as “organizational transformation” and further articulated it as “allowing the organization to more effectively realize its performance objectives” (p. 254). Additionally, Nonaka’s (1994) work allows for elaboration within this concept by addressing the theme of knowledge from an organizational perspective of learning.

The theoretical framework of organizational knowledge creation (Nonaka, 1994) utilizes four modes of knowledge conversion: socialization, externalization, internalization, and combination. These modes are based upon the two dimensions of knowledge creation: tacit and explicit (1994). Nonaka explained, “Tacit knowledge involves both cognitive and technical elements,” (1994, p. 16), and these are often understood as procedural knowledge (1994). Explicit knowledge is “codified knowledge” (1994, p. 16), which is often considered declarative knowledge (1994).

As these two elements of knowledge creation are applied, the role of individual responsibility within an organizational framework becomes apparent. Accordingly, Nonaka and Takeuchi (1995) expanded the definition of tacit knowledge as highly personal and hard to formalize, making it difficult to communicate or to share with others. Subjective insights, intuitions, and hunches fall into this category of knowledge. Furthermore, “tacit knowledge is deeply rooted in an individual’s action and experience,

as well as the ideals, values, or emotions he or she embraces” (Nonaka and Takeuchi, 1995, p. 8).

Thus, the interplay of individual and group learning dynamic evolves. Markedly, when articulated by the individual and transferred to a group, that tacit knowledge becomes explicit, yet in order for knowledge creation to transpire, it is “amplified or crystallized at the group level through dialogue, discussion, experience sharing, and observation” (Nonaka & Takeuchi, 1995, p.13). In other environments, when the individual participates in a truly collaborative effort with others, the “collaborative enterprise, such as this, exceed(s)...what no one of them alone could have learned, accomplished, or endured” (Bruffee, 1999, p. 9).

Nonaka and Takeuchi (1995) determined that “if knowledge cannot be shared with others or is not amplified at the group or divisional level, then knowledge does not spiral itself organizationally” (p. 225). They further suggest this spiral is a key to understanding organizational knowledge creation (Nonaka & Takeuchi, 1995), whereupon individual knowledge (tacit) is transferred to organizational knowledge (explicit).

In addition to a more succinct theory on knowledge creation and expression, Nonaka and Takeuchi’s (1995) work highlighted the paradoxical nature of individual and organizational knowledge. Disagreements exist between whether or not organizations can learn or if organizational learning is simply an interdependent total of the scattered individual occurrences of learning (Argyris & Schon, 1996; Weick & Westley, 1996). Mezirow and Associates (2000) summarized this by stating, “Transformational organizational change is often called discontinuous change to reflect the magnitude of the

change being effected. In learning organizations, transformative learning on the part of individuals is desired for purposes of meeting organizational goals” (p. 254-255). Several theories expand on the idea of organizational learning by defining an organization as a culture that stimulates learning (Weick & Westley), social construction knowledge (Bruffee, 1999), or model of continual and cyclical learning (Cowan, 1995).

In regard to individual learning, Bruffee (1999) described the phenomenon of the social construction of collaborative learning as “a reacculturative process that helps students become members of knowledge communities whose common property is different from the common property of the knowledge communities they already belong to” (p. 3). Bruffee also addressed the paradoxical blend of organizational and individual learning by stating, “Collaborative learning assumes instead that knowledge is a consensus among the members of a community of knowledgeable peers – something people construct by talking together and reaching agreement” (p. 3). In particular, Bruffee noted that when a student enters a university, he or she enters a new culture and community of knowledge and learning. He further articulated that this process is a collective effort of recurrent, progressive actions by both the university and the student. This transitional process of maturation was defined by Bruffee as reacculturation.

Davis (2003) asserted that a requisite for an organization to support this transition is that it contains rational procedures and an effective method for change. Davis’ comprehensive change model provided a linear and logical sequence for change to occur in organizations. These steps, that help cultivate the adaptive learning environment needed in a college, are: (a) establish a sense of urgency, (b) create the guiding team, (c) develop a vision and strategy, (d) communicate the change vision, (e) empower the action

team, (f) generate short-term wins, (g) consolidate change and produce more change, and (h) institutionalize change in the culture. Oldroyd and Hall (1997) applied this model directly to the process of institutions within higher education seeking enrichment in college retention. Additionally, Oldroyd and Hall claimed that without an institution's commitment to positive cultural changes and circular learning, a student is unlikely to develop positive environmental experiences and perceptions.

Tinto's (1975, 1994) framework of academic and social integration provides an appropriate lens for viewing the blended models of retention analysis and learning environments. Tinto's model presumes that students enter into the university environment with a dynamic range of experiences and characteristics. These attributes contribute to particular expectations of and commitments by the student. These characteristics play a key role in the students' interaction with the social and academic environment of the college. The model focuses on the level of a student's integration into the social and academic systems of the college, allowing for a determination of persistence or dropout. The higher the degree of integration, the more likely the student is to persist (Mannan, 2007).

Identifying potential risk factors and better understanding the environment of organizational and individual learning are important factors for policy makers within higher education. The culture of learning provided by the campus, especially in regard to the interplays of organizational learning, directly connect organizational knowledge creation with the environmental components of the retention models presented earlier in this chapter. The dynamic of student reacculturation, specifically regarding its focus on a

first year student's adjustment from high school to college, encompasses the aforementioned transition theories and studies related to predictors of academic success.

Summary

The consideration of conditional admittance of a first year student to a public, four-year university is inclusive to a number of significant themes. Research addresses both the learning capacity of the student (Argyris & Schon, 1996; Weick & Westley, 1996) and learning environment provided by the organization (Davis, 2003; Oldroyd & Hall, 1997). The literature noted a student's ability to create knowledge and reacculture to a new learning environment as keys to success in college (Bruffee, 1999; Tinto, 1994). Additionally, economic and demographic factors have influenced universities to seek effective measures for retaining students from the first to second year and, at the time of application to the university, predict his or her likelihood to persist (Fowler, 2009; Hoover, 2009). Fowler noted that significant changes in education over the decades have significantly influenced colleges and universities in the formation of policy, including those affecting the approach to admission criteria and decisions.

The aforementioned literature review established a basis for the intent of this study: to evaluate both academic admission and demographical factors of conditional admits in correlation with factors of first to second year college retention and student academic success. Chapter Three provides an extensive description of the quantitative research design and methodology used to address the purpose of the project. The findings of the study are presented in Chapter Four. Finally, a discussion of the results, study limitations, and recommendations for further research are presented in Chapter Five.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

Introduction

Research suggests that students are best prepared for college if they have successfully completed core curriculum courses in high school (Geiser, 2009). Selective universities have developed admission policies that determine admissibility based on information related to core curriculum courses, standardized test scores, high school grade point average (GPA) and class rank percentile, and other factors (Schmidt, 2008). Some students who do not meet the admission policy requirements apply for an appeal to the decision, noting various reasons as to why they should be admitted. The admission appeal committee at a public four-year, Midwest university has created an informal process based on the formal admission policy (Fowler, 2009). Appeals are granted based on anecdotal evidence and subjective analyses, and are often evaluated inconsistently. Because college retention and student academic success are reliant upon a prepared first-time freshman class, the appeal committee is responsible for applying a formative evaluation (Fowler) of the appeals process, detailing empirical factors to use in the procedure.

Chapter three outlines the research questions addressed in this study, followed by a description of the population and sampling techniques used. The next section describes in detail both the data collection and instrumentation methods implemented in the study. The chapter concludes with an explanation of data analyses used in the study. This study, using the conditionally admitted student as the unit of analysis, was intended to explore

factors that best predict college retention and student academic success in regard to factors related to academic admission factors and student demographics.

Research Questions

Within the context of this study, the following research questions were addressed:

1. What academic admission factors of conditionally admitted students best predict first year academic success?
2. Are there differences between groups of conditionally admitted students based on demographic factors in their first year academic success and college retention?
3. Based on the student demographic factors that most significantly differentiate first year academic success, what academic admission factors of conditionally admitted students best predict first year academic success?
4. For conditionally admitted students, are there differences in first year academic success between students who are and are not retained from the first to the second year?

Population and Sample

The population of the study was comprised of conditionally admitted first-time freshmen at selective, public, four-year universities, while the sample included a subset of the population from one particular university. Students who are conditionally admitted to a university do not meet the institution's stated admission policy and therefore must be admitted based on an appeal or exception to the policy. While admission policies vary among selective universities, the occurrence of students who do not meet the minimum requirement and request admission as an exception to the policy remains consistent (Zwick, 2007).

Central State University (CSU) was the site for this study. In order to provide anonymity, CSU is a pseudonym for the actual name of the university. CSU is a state-funded, four-year, regionally accredited institution. In addition to the main four-year campus, it also includes a two year, specialized fruit experimentation, and internationally located campus. The main campus maintains an average population of 19,500 total students and 2,650 first-time freshmen. Of the total student population, approximately 88% are from the institution's state, seven percent are from out-of-state, and five percent are from another country. It is also comprised of 56% females and 44% males, along with a minority student population of seven percent. Of the first-time freshmen, over 80% are ranked in the top half of their high school class, the average ACT is 24.2, and the average high school GPA is 3.44.

The following explanations are provided to better understand the aforementioned description of the population. First-time freshmen are students new to the university who also do not meet the institution's definition of a transfer student. Transfer, readmitted, and continuing students were not included in the population. A selective institution is one that does not admit all students, but only those who meet the parameters of an admission policy, based on criteria such as standardized test scores, high school GPA, and high school class rank percentile. A public university is one that is predominantly funded by appropriations from the state or federal government (Kenny, 1998). Students from privately funded universities, without state appropriations, were not included in the study. A four-year university is one that rewards a traditionally four-year (Bachelor's) degree or higher. Students from institutions that do not offer four-year but only two-year degrees or certificate programs were not included in the population.

A single-stage, convenience sample (Creswell, 2003) was used, due to the researcher's direct access to the university's data. The sample included 249 conditionally admitted first-time freshmen over a period of three years at CSU. These students were admitted as an exception to the admission policy based on one of two conditions: (a) the admission appeal committee granted admission or (b) the student was admitted as a CSU athlete. Students admitted by the committee or who began in the summer were automatically enrolled in a conditional admittance advisement program and coded appropriately. Athletes were advised separately by the athletic department and therefore did not receive a code specific to their status as a conditional admit.

The time period of the sample included students who applied and enrolled for the fall 2006, fall 2007, and fall 2008 semesters. Admission requirements during this time period did not change. However, membership of the appeals committee did change, which may indicate an inconsistent process of deliberation by the committee. Evaluating these three particular semesters allowed two conditions to be achieved: (a) an appropriately sized sample (Fraenkel & Wallen, 2003) and (b) first to second year retention, as a dependent variable of success, could be evaluated.

Data Collection and Instrumentation

In this study, the dataset of independent (predictor) and dependent (criterion) variables related to student academic success for the conditionally admitted students was previously collected through several types of instrumentation and was available to the researcher. The instruments included the University's application for admission, high school and college transcripts, and the letters of appeal, all submitted by the applicants.

Fink (2006) described reliability as consistency, meaning it will “yield the same results every time it is used to measure the same object, assuming that the object itself hasn’t changed” (p. 37-38). The application for undergraduate admission requires objective information, such as demographics and academic records. Therefore, it collects the same information from an applicant for each submission, unless information about the applicant has changed. At CSU, the application for admission did not change during the semesters associated with the study. In addition to the application for admission CSU requires high school and college transcripts, and in some cases a letter of appeal, each developed and submitted by the sending institution or applicant.

Fink (2006) defined validity as accuracy. Whereas reliability offers the same answer consistently, validity refers to the assurance that the results are correct. Pertinent information collected in the undergraduate application for admission is reliable, but not necessarily upon initial submission. Sometimes, the submission of the application involves self reported information. At this point in the application process the student has the ability to provide false information. However, the admission decision requires submitted information be validated with official transcripts. Therefore, the final dataset for admitted students to the university is accurate, due to a valid data collection instrument. Information submitted in the letter of appeal, on the other hand, is self-reported and therefore may lack assurance of validity. The letter of appeal was one of four possible indicators used to populate the independent variable that denoted a conditional admit participated in athletics while in high school. This was the only field with a potential question of validity.

Data Sources

In coordination with CSU's Office of Admissions, the researcher determined both independent and dependent variables appropriate to the study. The independent variables are the information provided during the students' application for admission process, available to the practitioners, and were divided into two types: category and interval. Category independent variables (Table 2) were labeled as "student demographic factors" and interval independent variables (Table 3) were labeled as "academic admission factors."

Table 2

Category Independent Variables (Predictors): Student Demographic Factors

Variable	Number of Groups	Possible Values
Sex	2	male, female
Ethnicity	2	minority, non-minority
CSU athlete	2	yes, no
Type of high school	2	public or private
Application fee waiver	2	yes, no
Athletic participation in high school	2	yes, no
Type of conditional admit	2	athlete, exception to appeal granted
Geographic origin location	4	24 county region, other in-state, out-of-state, another country
Earned college credit hours prior to college	2	yes, no

Table 3

Interval Independent Variables (Predictors): Academic Admission Factors

Variable
GPA of completed credit prior to college
ACT composite
ACT English
ACT reading
ACT math
ACT science
Class rank percentile
Class size
High school core curriculum GPA
High school GPA
Number of core curriculum courses taken during senior year of high school
Number of math units that met core curriculum

The independent variables were obtained through several sources available to the researcher, such as the application for admission, letter of admission appeal, and high school and college transcripts. To collect the dependent variables, data pertaining to predictors of academic success, several data sources available to the researcher were accessed. Queries on the university’s student data system were used to find the students who met the conditions of the sample. University athletes did not have the same conditionally admitted status as the other sample members. Thus, conditionally admitted

athletes were selected by manually evaluating the application credentials of admitted first-time freshmen athletes for the fall 2006, fall 2007, and fall 2008 semesters.

The application for admission was used to collect sex, ethnicity, geographic origin location, university athlete indicator, ACT scores, high school class rank percentile, high school class size, and application fee waiver predictors. College credit while completed in high school and the resultant GPA was collected from the college transcript(s) submitted in the application process. The type of school designation, number of core curriculum courses taken during the senior year, senior year and cumulative GPAs to show improvement in grades during the senior year, high school core curriculum GPA, and number of math units were collected from the high school transcript submitted in the application process.

An acknowledgement of athletic participation in high school was collected from a combination of the application for admission, high school transcript, letter of appeal, and CSU student data system. Thus, in some cases an indicator of athletic participation in high school was based on voluntary information provided by the student. Therefore, it is possible a student should have had this predictor but did not disclose the information. The address of geographic origin location was obtained from the student data system.

The dependent variables were the measures used to subsequently determine the students' academic success and were divided into two types: category (Table 4) and

Table 4

Category Dependent (Criterion) Variable: College Retention

Variable	Number of Groups	Possible Values
First to second year retention	2	yes, no

interval (Table 5). The category dependent variable was labeled as “college retention,” and interval dependent variables were labeled as “first year academic success.” The following analyses were performed on the sets of variables: (a) interval independent variables compared with interval dependent variables, (b) category independent variables compared with interval dependent variables, (c) category independent variable compared with category dependent variables, and (d) category dependent variables compared with grouping variables.

Table 5

Interval Dependent (Criterion) Variables: First Year Academic Success

Variable
CSU GPA after first year of college
Hours earned after first year of college

Dependent variables were also obtained as data available to the researcher. The three, first to second year CSU GPA, retention, and credit hours earned, were stored in and retrieved from CSU’s student data system.

Data Analysis

All statistical analyses in the study were conducted using Statistical Package for the Social Sciences (SPSS) 16.0 edition for Windows statistical software. The objective of the analyses administered in this study was to answer the four research questions specified earlier in this chapter. The following section describes how data were prepared and SPSS was used in the analyses of the student demographic factors, admission

academic factors, first year academic success and first to second year college retention variables.

Several steps were employed to prepare and ensure the data for proper analysis. These steps included: (a) identifying and categorizing the independent and dependent variables; (b) querying the administrative application system; (c) assigning values to variables based on evaluation of query results; (d) reviewing high school and college transcripts, and letters of appeal to assign values to particular variables; (e) querying the student administrative system; and (f) determining the most appropriate method of quantitative analysis for each research question.

The process was started by first identifying the independent variable data elements collected through the admission process. After reviewing these variables, the elements were divided into two groups, category independent variables and interval independent variables. Both groups' elements were collected through different sources.

Category independent variables. The category independent variables were labeled as "student demographic factors." In this subsection of independent variables, the sex, ethnicity, indication if the student was a university athlete, and listing of an application for admission fee waiver were collected through the application for admission and queried from the administrative admission system. Each had one of two possible values, male or female, minority or non-minority, and yes or no for the remaining two respectively.

The type of high school was determined by querying for the high school name and designating the appropriate type based on the knowledge of the researcher and Office of Admissions staff. Two values were possible: public or private.

The geographic origin location, similarly, was determined by querying the geographic origin code, which displayed a county name, state, or country. Four designations were possible: a CSU 24-county service area, another county in the same state, out-of-state, or another country.

The factor of whether or not the student earned college credit hours while in high school was determined by querying the administrative admission system, reviewing the high school graduation year and year of entry to CSU, viewing the number of completed hours, and assigning an appropriate status. The two statuses available were: yes and no.

The type of conditionally admitted student was determined by querying both the athletic indicator and semester and year of application fields, using the two in conjunction to apply an appropriate status. It contained two possible values: athlete and exception to appeal granted. Athletes were not coded in the system with a conditional admission code, so they were obtained from a list provided by CSU and added to the query. Fall conditional admits did not meet the core curriculum requirement and/or were not from the host state, and therefore were admitted as an exception by the admission appeal committee.

The athletic participation in high school was determined by reviewing a combination of the application for admission, high school transcript, letter of appeal, and CSU student data system. The first two sources listed were submitted by all students. The letter of appeal was submitted only by non-CSU athletes seeking an appeal for the fall semester. Those students admitted as athletes were not required to submit a letter of appeal. The CSU data system only contained an athletic code for those students designated as a CSU athlete. Two possible choices were available: yes and no.

Interval independent variables. The interval independent variables were labeled as “academic admission factors.” In this subsection of independent variables, the GPA of completed credit prior to college, ACT scores, class rank percentile, class size, and high school GPA factors were collected through the application for admission and queried from the administrative admission system. The number of core curriculum courses taken during senior year, high school core curriculum GPA, and number of math units that meet core curriculum requirement factors were determined by reviewing the high school transcript of each student. Because the format and content of high school transcripts vary, these factors were determined by careful review by the researcher.

Category dependent variable. The category dependent variable was labeled as “college retention.” In this subsection of dependent variables, the first to second year retention value was queried from the student data system by comparing the fall semester of entry and subsequent fall semester fields. If the latter field was populated with a “Y,” then the student was retained from the first to second year.

Interval dependent variables. The interval dependent variables were labeled as “first year academic success.” In this subsection of dependent variables, the CSU GPA and hours earned after the first year were queried from the student data system.

Statistical Analysis

Descriptive analysis statistics, using quantitative measures of non-experimental design (Fink, 2006) are commonly used in quantitative studies. This study utilized several different data analysis procedures in order to appropriately address each research question, as noted in Table 6.

Table 6

Research Question, Analysis, and Variables Used for Statistical Analyses

Research Question	Type of Analysis	Variables Used
1. What academic admission factors of conditionally admitted students best predict first year academic success?	Forward linear regression and Pearson correlation	Compare interval independent variables with interval dependent variables
2. Are there differences between groups of conditionally admitted students based on demographic factors in their first year academic success and college retention?	(a) Independent samples <i>t</i> -tests for groups of two; ANOVA for groups of more than two (b) Cross-tabs with Chi Square	(a) Compare category independent variables with interval dependent variables (b) Compare category independent variables with category dependent variable
3. Based on the student demographic factors that most significantly differentiate first year academic success, what academic admission factors of conditionally admitted students best predict first year academic success?	Forward linear regression and Pearson correlation	Subcategories of category independent variables compared with interval dependent variables
4. For conditionally admitted students, are there differences in first year academic success between students who are and are not retained from the first to the second year?	Independent samples <i>t</i> -tests	Compare category dependent (becomes grouping variable) variable with interval dependent variables (test variables)

Research question one was presented as, “What academic admission factors of conditionally admitted students best predict first year academic success?” To address this question, the interval independent variables were compared with the interval dependent variables through a forward linear regression analysis. The purpose of using multiple regression was to discern what combination of interval independent variables best predicted the interval dependent variable (Mertler & Vannatta, 2005). To address the question, GPA of completed credit prior to college, ACT composite, ACT English, ACT reading, ACT math, ACT science, class rank percentile, class size, high school GPA, number of core curriculum courses taken during senior high school year, high school core curriculum GPA, and the number of math units that meet the core curriculum requirement served as the independent variables. The CSU GPA and hours earned after the first year served as the dependent variables. An alpha level of .05 was set to determine the significance of the results (Mertler & Vannatta).

For research question two, “Are there differences between groups of conditionally admitted students based on demographic factors in their first year academic success and college retention?”, two types of analysis were used. Category independent, i.e., grouping, variables were compared with interval dependent variables. When the category independent, i.e., grouping, variable included two groups, an independent samples *t*-test was computed. An alpha level of .01 was utilized for each independent samples *t*-test instead of an alpha level of .05 to decrease the likelihood of relaying inaccurate results and improve the rigor of analysis (Mertler & Vannatta, 2005). In these analyses, the independent variables of sex, ethnicity, CSU athlete, application fee waiver, athletic participation in high school, and earned college credit hours prior to college were

compared with the dependent variables of CSU GPA and hours earned after first year of college.

When the category independent variable included more than two groups, an analysis of variance (ANOVA) was applied to determine whether or not the means of these groups were equal (Field, 2005). An ANOVA was used as opposed to two samples *t*-tests to minimize the chance of committing a type one error or “false positive” (Field). In these analyses, the independent variables of type of high school, type of conditional admit, and geographic origin location were compared with the dependent variables of CSU GPA and hours earned after first year of college.

Also, category independent variables were compared with the category dependent variable using a cross tabulation with a chi-square test to look for deviations from observed to expected frequencies (Fraenkel & Wallen, 2003). In these analyses, the independent variables of sex, ethnicity, CSU athlete, type of high school, application fee waiver, athletic participation in high school, type of conditional admit, geographic origin location, and earned college credit hours prior to college were compared with the dependent variable of first to second year retention.

Research question three was presented as, “Based on the student demographic factors that most significantly differentiate first year academic success, what academic admission factors of conditionally admitted students best predict first year academic success?” To address this question, the category independent variables found to be significant predictors in research question two were analyzed. The datasets for these particular variables were split into its individual subcategories and both forward linear

regression analysis and Pearson correlations were applied, comparing them with the interval dependent variables of CSU GPA and hours earned after first year of college.

Research question four was articulated as, “For conditionally admitted students, are there differences in first year academic success between students who are and are not retained from the first to the second year?” To address this question, an analysis of the dependent variables of this study was applied. The category dependent variables were compared with the interval dependent variables using independent samples *t*-tests for comparison of means. For the purposes of this analysis, the category-variable of the study, first to second year retention, served as the grouping variable of the analysis, while the interval variables of the study, CSU GPA and hours earned after first year of college, served as the test variables of the analysis. An alpha level of .01 was utilized for each independent samples *t*-test.

Summary

Recent literature has focused on the factors used in university admission determinations (Geiser, 2009; Schmidt, 2008) and the first year college experience (Feldman, 2005; Upcraft, Gardner & Barefoot, 2005). However, a deficit in information regarding the items that best predict college retention and a student’s academic success during the first year exists. To provide an empirical perspective to the admission appeal decision makers, this study objectively compared predictors collected at the time of admission with predetermined dependent variables which define academic success.

The institution selected for this study, based primarily on the availability of convenience sampling, is a public, four-year, Midwest university. The unit of analysis included conditionally admitted first-time freshmen for the fall 2006, fall 2007, and fall

2008 semesters. Statistical analyses of forward linear regression, Pearson correlations, ANOVAs, independent samples t-tests, and crosstabs with Chi Square were performed, comparing a set of student demographic, academic admission, first year academic success, and college retention variables.

This chapter outlined the research questions used to guide the study and defined the population and sample. Furthermore, it described the means and method for data collection and instrumentation, including a definition of the independent and dependent variables and description of data sources available to the researcher. Finally, the method of data analysis and specific statistical analyses, including the software tool used, was illustrated.

Findings from data collected and analyzed will be reported in Chapter Four. Chapter Five will provide conclusions and implications based on these results and will also provide a final culmination and summary of the full study.

CHAPTER FOUR

RESULTS AND FINDINGS

Introduction

Practitioners at four year, public universities are being required to make decisions regarding the admittance of first-time freshmen who do not meet the stated admission requirements of the college. The university admission process helps to reveal the issues of policy, the high school to college transition, academic success, and retention. It is also significantly influenced by policy. Consistency between formal policy and informal practices is difficult to achieve (Fowler, 2009). When the admission policy is put into practice, practitioners are sometimes required to use subjective measures for decision making. This is especially the case in situations when the applicant does not meet the requirements of the policy.

In this case, the practitioner must evaluate additional information when making a decision about a possible exception to the policy. At this point, factors of the transition period from high school to college become relevant. College decision makers ask questions such as, what experiences and factors did the student bring from high school to make him or her prepared for college? Which of these best predict college retention and academic success? Practitioners would benefit from empirical data to guide them when making these decisions. Accordingly, a deeper study of the related issues is necessary.

The primary factor related to the admission decision regarding students who do not meet the stated admission requirements is policy. Therefore, policy was the foundational framework of this study. Different constituencies understand policy and its related concepts differently. Fowler (2009), for example, recognized at least seven

different interpretations of the term policy. In general, it is crafted by the influences of process (Hannah, 1997), politics (Morgan, 2006), power (Bryson & Crosby, 1992), and evaluation (Cook, 2002), all which have been dynamic throughout history. Each of these characteristics significantly affects colleges and universities in regard to setting admission policies.

Influence over admission policy is generated from several sources, including the governing state, and both internal and external university stakeholders. For the internal college perspective, policies are created to help attain enrollment and retention goals set by the institution (Kretchmar, 2006). Resultant to this set of circumstances is the circumstance of an applicant not meeting the requirements of the admission policy and therefore seeking a conditional admittance to the university.

This decision is closely related to the topic of college retention and student success. Colleges balance the rigor of an admission policy to maximize both enrollment at the front end and retention later. Therefore, colleges are continually seeking best practices for determining what student demographics and academic admission factors can be used to predict college retention and academic success. Inherent in this quest is also the desire to accurately define academic success (Kretchmar, 2006).

A shared responsibility between the student and the university is required to attain the goals of college retention and academic success. A student enters college with a preset slate of characteristics developed prior to college. Universities also influence college retention and student success by the quality of an environment conducive to learning that is provided (Astin, 1993; Tinto, 1993). Therefore, an in-depth study of both an institution's culture of organizational learning and a student's reacculturation to a new

learning community, including the associated risk factors, helped provide a more transparent lens for which to view this topic (Bruffee, 1999; DeBerard, Spielmans, & Julka, 2004; Nonaka, 1994).

Within this study, three frameworks were examined. Policy was presented from a broad to narrow perspective, including the influences of politics and power, and ramifications in regard to educational policy. Retention and student academic success were also evaluated according to the three theories of Astin's (1993) Input-Environment-Output Model, Scholssbert, Waters, and Goodman's (1995) study of Transition Theory, and Tinto's (1993) Theory of Student Departure, which helped to connect the subjects of university admission policies, and college retention and student academic success.

A review of student risk factors, organizational learning, Nonaka's (1994) theoretical framework of organizational knowledge creation, and Bruffee's (1999) explanation of reacculturation, was presented as well. This provided a more in-depth examination of both student inputs and university environmental factors related to the study. These three combined frameworks presented a comprehensive lens from which to view the study.

Overview of Study

This quantitative study examined a sample of 249 conditionally admitted first-time freshman at a four year public university to answer the research questions provided in the project. The single-stage, convenience sample (Creswell, 2003) included students admitted during three semesters of fall 2006, fall 2007, and fall 2008. The dataset included independent (predictor) and dependent (criterion) variables related the conditionally admitted students. The independent variables included both categorical and

interval elements collected at the time of application. The categorical independent variables were labeled “student demographic factors.” The interval independent variables were labeled “academic admission factors.” Prior to the study, these elements were all deemed by the researcher, through a combination of literature review and convenience sampling, as potential predictors of college retention and academic success.

The dependent variables also included both categorical and interval elements, which were collected after completion of the first year of college. The categorical dependent variable was labeled “college retention.” The interval dependent variables were labeled as “student academic success.” Prior to the study, these elements were determined to be the most appropriate descriptions of college retention and student academic success. See Tables 2 through 5 in Chapter Three for a listing of the individual variables.

The instruments included the University’s application for admission, high school and college transcripts, and the letters of appeal, all submitted by the applicants. Additionally, variables were queried from the Central State University (CSU) student data system by the researcher. All statistical analyses in the study were conducted using Statistical Package for the Social Sciences (SPSS) 16.0 edition for Windows statistical software, and included the following types: (a) multiple regression, (b) Pearson correlation, (c) independent samples *t*-tests, (d) a one-way ANOVA, (e) and cross-tabs with Chi Square, each applied to the appropriate research question(s). See Table 6 in Chapter Three for a synthesis of the research questions, types of analyses, and variables used.

Research Questions

Within the framework of this study, the following research questions were proposed:

1. What academic admission factors of conditionally admitted students best predict first year academic success?
2. Are there differences between groups of conditionally admitted students based on demographic factors in their first year academic success and college retention?
3. Based on the student demographic factors that most significantly differentiate first year academic success, what academic admission factors of conditionally admitted students best predict first year academic success?
4. For conditionally admitted students, are there differences in first year academic success between students who are and are not retained from the first to the second year?

Demographics

The dataset of the sample of 249 conditionally admitted first-time freshman at CSU during the fall 2006, fall 2007, and fall 2008 semesters included student demographic, academic admission, first year academic success, and college retention factors. Frequencies and descriptive analyses were applied to these data elements to define the demographic make-up of the sample. In some cases, the value of N did not equal 249 because that particular factor was not available in the student record. To account for this, valid percentiles were used in the frequency descriptions and a listwise analysis was applied (Field, 2009).

Frequencies were applied to the student demographic factors, i.e., category independent variables (see Table 7). The results indicated (a) all 249 records included a value for the *sex* variable with the results of 111 (44.6%) *female* and 138 (55.4%) *male*. The breakdown for the full cohort at CSU, including regular admits was 58.6% *female* and 41.4% *male* ($N = 7,937$). For the ethnicity variable, 235 of the records included a value, with the results of 191 (81.3%) *non-minority* and 44 (17.7%) *minority*. The breakdown for the full cohort at CSU, including regular admits was 91.9% *non-minority* and 8.1% *minority* ($N=7,672$).

All 249 records included a value for the *CSU athlete* indicator with the results of 104 (41.8%) *yes* and 145 (58.2%) *no*. The breakdown for the full cohort at CSU, including regular admits was 4.5% *yes* and 95.5% *no* ($N=7,937$). Also, all 249 records included a value for the *earned college credit prior to college* indicator with the results of 44 (17.7%) *yes* and 205 (82.3%) *no*. The breakdown for the full cohort at CSU, including regular admits was 55.8% *yes* and 44.2% *no* ($N=7,937$).

For the *type of high school* indicator, 244 of the records included a value, with the results of 159 (65.2%) *public* and 85 (34.8%) *private*. The breakdown for the full cohort at CSU for this variable was not available. All 249 of the records included a value for the *application fee waiver* variable with the results of four (1.6%) *yes* and 245 (98.4%) *no*. The breakdown for the full cohort at CSU, including regular admits was 2.3% *yes* and 97.7% *no* ($N=7,937$).

All 249 of the records included a value for the *athletic participation in high school* variable with the results of 72 (28.9%) *yes* and 177 (71.1%) *no*. Also, all 249

Table 7

Frequencies of Student Demographic Factors for Conditional Admits

Variable	N	Frequency	Valid Percent
Sex	249	Female = 111 Male = 138	Female = 44.6% Male = 55.4%
Ethnicity	235	Non-minority = 191 Minority = 44	Non-minority = 81.3% Minority = 18.7%
CSU Athlete	249	Yes = 104 No = 145	Yes = 41.8% No = 58.2%
Earned College Credit Prior to College	249	Yes = 44 No = 205	Yes = 17.7% No = 82.3%
Type of High School	244	Public = 159 Private = 85	Public = 65.2% Private = 34.8%
Application Fee Waiver	249	Yes = 4 No = 245	Yes = 1.6% No = 98.4%
Athletic Participation in High School	249	Yes = 72 No = 177	Yes = 28.9% No = 71.1%
Type of Conditional Admit	249	CSU Athlete = 41 Appeal Granted = 208	CSU Athlete = 16.6% Appeal Granted = 83.5%
Geographic Origin Location	248	24 County Area = 35 Other In-State = 184 Out-of-State = 28 Another Country = 1	24 County Area = 14.1% Other In-State = 74.2% Out-of-State = 11.3% Another Country = .4%

of the records included a value for the *type of conditional admit* variable with the results of 41 (16.5%) *CSU athlete* and 208 (83.5%) *appeal granted*. For the *geographic*

origin location variable, 248 of the records included a value, with the results of 35 (14.1%) *24 county service area*, 184 (74.2%) *other in-state*, 28 (11.3%) *out-of-state*, and 1 (0.4%) *another country*. The breakdown for the full cohort at CSU was not available.

A descriptive analysis was applied to the academic admission factors, i.e., interval independent variables (see Table 8).

Table 8

Descriptives of Academic Admission Factors for Conditional Admits

Variable	<i>N</i>	Mean	<i>sd</i>
ACT Composite	242	19.30	1.71
ACT Math	242	18.29	2.55
ACT Reading	242	19.62	3.42
ACT English	242	19.00	3.13
ACT Science	242	19.69	2.35
High School Class Rank Percentile	211	39.97	15.71
High School Class Size	211	285.82	166.32
High School GPA	249	2.84	.38
Number of Core Curriculum Course Taken During Senior Year of High School	238	20.15	3.94
High School Core Curriculum GPA	239	2.56	.40
Number of Math Units That Met Core	236	3.62	.73
GPA of Completed Credit Prior to College	44	2.87	.77

The results for *ACT composite* displayed $N=242$ with a mean of 19.3, *ACT math* as $N= 242$ with a mean of 18.29, *ACT reading* as $N=242$ with a mean of 19.62, *ACT English* as $N=242$ with a mean of 19.0, and *ACT science* as $N=242$ with a mean of 19.69.

The *high school class rank percentile* resulted in $N=211$ with a mean of 39.97, *high school class size* in $N = 211$ with a mean of 285.82, (h) *high school GPA* as $N= 249$ with a mean of 2.84, *number of core curriculum courses taken during the senior year of high school* as $N=238$ with a mean of 20.15, and *high school core curriculum GPA* as $N=239$ with a mean of 2.56, *number of math units that met the core* in $N = 236$ with a mean of 3.62, and *GPA of completed credit prior to college* in $N = 44$ with a mean of 2.87.

Frequencies were applied to the college retention factor, i.e., category dependent variable (see Table 9). The results indicated all 249 records included a value for the *first to second year retention* variable. The results were 158 (63.5%) with a value of “yes” and 91 (36.5%) with a value of “no.” The most recent, according to the time this study was designed, first to second year overall retention rate at CSU was 76%. Therefore, the first to second year retention rate is 12.5% lower for conditional admits.

Table 9

Frequency of the College Retention Factor for Conditional Admits

Variable	<i>N</i>	Frequency	Valid Percent
First to Second Year	249	Yes = 158	Yes = 63.5%
Retention*		No = 91	No = 36.5%

Note. * CSU first to second year overall retention rate for fall 2008 to fall 2009 was 76%.

A descriptive analysis was applied to the first year academic success factors, i.e., interval dependent variables. The results displayed a *CSU GPA after the first year of college* of $N=249$ with a mean of 2.24. This compares to a full cohort result of $N=7,887$ and mean of 3.21. Relative to this study is the academic standing policy at CSU. If a student receives less than a 2.00 GPA at the end of any semester, then she/he is placed on academic probation. The results also displayed an *hours earned after first year of college* of $N= 249$ with a mean of 21.48 (see Table 10). This compares to a full cohort result of $N=7,758$ and mean of 26.29.

Table 10

Descriptives of First Year Academic Success for Conditional Admits

Variable	<i>N</i>	Mean	<i>sd</i>
CSU GPA after the First Year of College	249	2.24	.77
Hours Earned after First Year of College	249	21.48	7.80

Research Question One

To determine what academic admission factors of conditionally admitted students best predict first year academic success, a forward linear regression model was applied, comparing the academic admission factors with both the *GPA after the first year of college* and *hours earned after the first year of college*. Forward selection is a version of the model that enters the variables into the model one at a time in an order determined by the strength of their correlation with the criterion variable. As each variable is added, it is

assessed. Those variables that do not significantly add to the success of the model are excluded (Field, 2009).

Earned Credit Hours after the First Year of College

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of college*. Regression results indicated that the final model demonstrated significant prediction of *earned credit hours after the first year of college* ($R = .655$, $R^2 = .429$, $R_{adj} = .396$, $F(2)$, $p < .001$, $S_{est} = 4.563$). This model accounts for 42.5% (R^2) of the variance in the *earned credit hours after the first year of college*.

When *earned credit hours after the first year of college* was predicted at an alpha level of .05, it was found that *high school core curriculum GPA* ($Beta = .615$, $Std Error = 2.120$, $p < .001$) and *number of core curriculum courses taken during the senior year of high school* ($Beta = .393$, $Std Error = .152$, $p = .005$) were significant predictors. *ACT composite* ($Beta = -.018$, $p = .889$), *ACT math* ($Beta = -.064$, $p = .622$), *ACT reading* ($Beta = -.006$, $p = .962$), *ACT English* ($Beta = .107$, $p = .454$), *ACT science* ($Beta = -.127$, $p = .336$), *class rank percentile* ($Beta = .140$, $p = .325$), *high school class size* ($Beta = .174$, $p = .176$), *high school GPA* ($Beta = .258$, $p = .208$), *number of math units that met the core* ($Beta = -.023$, $p = .884$), and *GPA of completed credit prior to college* ($Beta = -.019$, $p = .889$) did not add significantly to the prediction model (see Table 11). The overall model fit was $R^2 = 0.429$.

GPA after the First Year of College

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of the *GPA after the first year of college*.

Table 11

Forward Linear Regression of Academic Admission Factors and Earned Credit Hours after First Year of College for Conditional Admits (N=249)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-12.601	7.237		-1.741	.090
High School Core Curriculum GPA	9.971	2.120	.615	4.703	<.001
No. of Core Curriculum Courses Taken Senior Year	.456	.153	.393	3.003	.005
ACT Composite			-.018	.141	.889
ACT Math			-.064	-.498	.622
ACT Reading			-.006	-.048	.962
ACT English			.107	.758	.454
ACT Science			-.127	-.976	.336
Class Rank Percentile			.140	.998	.325
Class Size			.174	1.382	.176
High School GPA			.258	1.284	.208
No. of Math Units Met Core			-.023	-.147	.884
GPA of Completed Credit Prior to College			-.019	-.140	.889

Regression results indicated that the final model demonstrated significant prediction of GPA after the first year of college ($R = .602$, $R^2 = .362$, $R_{adj} = .326$, $F(2)$, $p < .001$, S_{est}

=.480). This model accounts for 36.2% (R^2) of the variance in the earned *GPA after the first year of college*.

When *GPA after the first year of college* was predicted (see Table 12) at an alpha level of .05, it was found that *ACT English* ($Beta = .482$, $Std Error = .031$, $p < .001$) and *high school core curriculum GPA* ($Beta = .475$, $Std Error = .223$, $p = .002$) were significant predictors. *ACT composite* ($Beta = -.147$, $p = .434$), *ACT math* ($Beta = .005$, $p = .975$), *ACT reading* ($Beta = -.021$, $p = .884$), *ACT science* ($Beta = -.210$, $p = .141$), *class rank percentile* ($Beta = .048$, $p = .750$), *high school class size* ($Beta = .079$, $p = .567$), *high school GPA* ($Beta = .251$, $p = .240$), *number of core curriculum courses taken during senior year of high school* ($Beta = .190$, $p = .204$), *number of math units that met the core* ($Beta = -.016$, $p = .915$), and *GPA of completed credit prior to college* ($Beta = .095$, $p = .525$) did not add significantly to the prediction model (see Table 12). The overall model fit was $R^2 = 0.362$.

Research Question One Summary

To answer the first research question, a forward linear regression analysis was applied to determine the combination of academic admission factors that best predict first year academic success. The results of the analysis, used to compare the interval independent variables with the interval dependent variables, indicated that both *high school core curriculum GPA* and *number of core curriculum courses taken during the senior year of high school* were significant predictors of *earned credit hours after the first year of college*. The academic admission variables of *ACT composite*, *ACT math*, *ACT reading*, *ACT English*, *ACT science*, *class rank percentile*, *high school class size*,

Table 12

Forward Linear Regression of Academic Admission Factors and GPA after First Year of College for Conditional Admits (N=249)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-1.641	.947		-1.733	.092
ACT English	.109	.031	.482	3.490	.001
High School Core Curriculum GPA	.767	.223	.475	3.441	.002
ACT Composite			-.147	-.791	.434
ACT Math			.005	.031	.975
ACT Reading			-.021	-.147	.884
ACT Science			-.210	-1.508	.141
Class Rank Percentile			.048	.321	.750
Class Size			.079	.578	.567
High School GPA			.251	1.196	.240
No. of Core Curriculum Courses Taken			.190	1.296	.204
Senior Year					
No. of Math Units Met Core			-.016	-.107	.915
GPA of Completed Credit Prior to College			.095	.642	.525

high school GPA, number of math units that met the core, and GPA of completed credit prior to college did not add significantly to the prediction model.

The results of the analysis also indicated that both *ACT English* and *high school core curriculum GPA* were significant predictors of *GPA after the first year of college*. The academic admission variables of *ACT composite, ACT math, ACT reading, ACT science, class rank percentile, high school class size, high school GPA, number of core*

curriculum courses taken during senior year of high school, number of math units that met the core, and GPA of completed credit prior to college did not add significantly to the prediction model (see Figure 3).

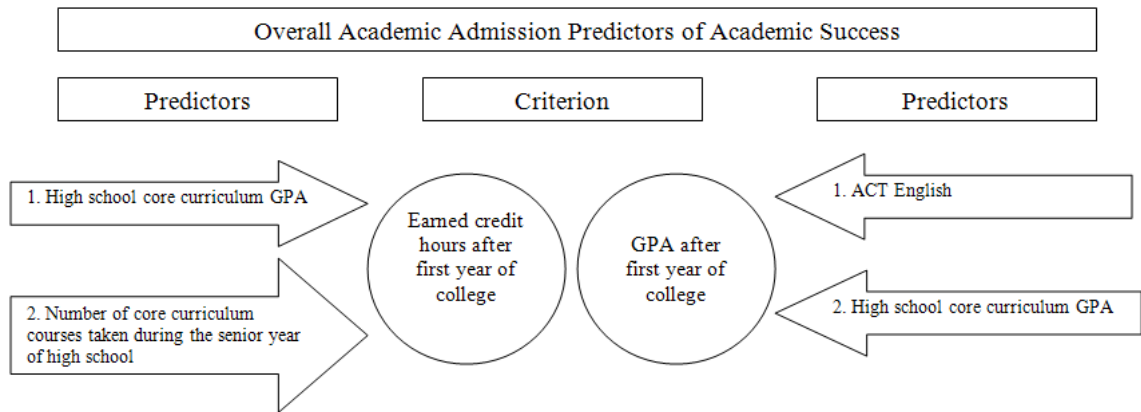


Figure 3. Overall Academic Admission Predictors of Academic Success.

Research Question Two

To determine if there were differences between groups of students based on demographic factors in their first year academic success and college retention, several steps were taken. First, the student demographic factors (category independent variables) containing groups of two were compared with the first year academic success (interval independent variables).

Student Demographic Factors, First Year Academic Success, Groups of Two

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *females* and *males* of the *sex* category. The value of the *CSU GPA after the first year of college* was found to be significantly different between the *sex* groups ($t(247)=2.930, p=.004$). The *females* had a mean score of 2.394 (*s.d.*=.723) while the

males had a mean score of 2.109 (*s.d.*=.793). This indicates that the *females* had significantly higher GPAs than the *males*. The value of the *hours earned after the first year of college* also was found to be significantly different between the *sex* groups ($t(247)=2.611, p=.008$). The *females* had a mean score of 22.900 (*s.d.*=6.772) while the *males* had a mean score of 20.330 (*s.d.*=8.390). This indicates that the females had a significantly higher number of earned credit hours than the males (see Table 13).

Table 13

Independent Samples t-Test, Sex and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	249	2.930	247	.004
Hours Earned after First Year of College	Equal Variances Not Assumed	249	2.672	246.996	.008

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *non-minorities* and *minorities* of the *ethnicity* category. The value of the *CSU GPA after the first year of college* was not found to be significantly different between the *ethnicity* groups ($t(233)=1.314, p=.190$). The *non-minorities* had a mean

score of 2.281 (*s.d.*=.764) while the *minorities* had a mean score of 2.114 (*s.d.*=.756). This indicates that the *non-minorities* did not have significantly different GPAs than the *minorities*. The value of the *hours earned after the first year of college* also was not found to be significantly different between the *ethnicity* groups ($t(233)=-.046, p=.064$). The *non-minorities* had a mean score of 21.620 (*s.d.*=7.783) while the *minorities* had a mean score of 21.680 (*s.d.*=7.329). This indicates that the non-minorities did not have a significantly different number of earned credit hours than the minorities (see Table 14).

Table 14

Independent Samples t-Test, Ethnicity and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	235	1.31	233	.190
Hours Earned after First Year of College	Equal Variances Assumed	235	-.05	233	.964

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *yes* and *no* values of the *CSU athlete* category. The value of the *CSU GPA after the first year of college* was not found to be significantly different between the

CSU athlete groups ($t(247)=-.472, p=.638$). The *yes* values had a mean score of 2.209 ($s.d.=.717$) while the *no* values had a mean score of 2.260 ($s.d.=.810$). This indicates that the *CSU athletes* did not have significantly different GPAs than the *non-CSU athletes*. The value of the *hours earned after the first year of college* was also not found to be significantly different between the *CSU athlete* groups ($t(247)=2.09, p=.033$). The *yes* values had a mean score of 22.690 ($s.d.=7.08$) while the *no* values had a mean score of 20.61 ($s.d.=8.19$). This indicates that the *CSU athletes* did not have a significantly different number of earned credit hours than the *non-CSU athletes* (see Table 15).

Table 15

Independent Samples t-Test, CSU Athlete and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	249	-.47	247	.638
Hours Earned after First Year of College	Equal Variances Not Assumed	249	2.15	238.47	.033

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *public* and *private* groups of the *type of high school* category. The value of the *CSU GPA after the first year of college* was not found to be significantly different

between the *type of high school* groups ($t(242)=-.200, p=.047$). The *public* school value had a mean score of 2.166 ($s.d.=.799$) while the *private* school value had a mean score of 2.37 ($s.d.=.078$). This indicates that the public school values did not have significantly different GPAs than the private school values. The value of the *hours earned after the first year of college* was also not found to be significantly different between the *type of high school* groups ($t(242)=-1.59, p=.113$). The *public* school values had a mean score of 20.860 ($s.d.=8.030$) while the *private* school values had a mean score of 22.510 ($s.d.=7.120$). This indicates that the public school values did not have a significantly different number of earned credit hours than the private school values (see Table 16).

Table 16

Independent Samples t-Test, Type of High School and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	244	-2.00	242	.047
Hours Earned after First Year of College	Equal Variances Not Assumed	244	-1.65	190.31	.101

An independent samples *t*-test analysis to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *yes* and *no* values of the *application fee waiver* category could not be calculated because the

$N=4$ value of the *yes* subcategory. The small sample size did not allow for a significant differentiation analysis (Mertler & Vannatta, 2005).

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *yes* and *no* values of the *athletic participation in high school* category. The value of the *CSU GPA after the first year of college* was not found to be significantly different between the *athletic participation in high school* groups ($t(247)=-.867, p=.387$). The *yes* values had a mean score of 2.303 ($s.d.=.703$) while the *no* values had a mean score of 2.209 ($s.d.=.801$). This indicates that the students who indicated athletic participation in high school did not have significantly different GPAs than those who did not indicate athletic participation in high school. The value of the *hours earned after the first year of college*, however, was found to be significantly different between the *athletic participation in high school* groups ($t(149.377)=2.517, p=.013$). The *yes* values had a mean score of 23.310 ($s.d.=7.006$) while the *no* values had a mean score of 20.730 ($s.d.=8.002$). This indicates that the students who indicated athletic participation in high school had a significantly higher number of earned credit hours than those who did not indicate athletic participation in high (see Table 17).

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *CSU athletes* and *appeals granted* groups of the *type of conditional admit* category. The value of the *CSU GPA after the first year of college* was not found to be significantly different between the *type of conditional admit* groups ($t(247)=1.50, p=.135$). The *CSU athletes* had a mean score of 2.070 ($s.d.=.670$) while the conditional

Table 17

Independent Samples t-Test, Athletic Participation in High School and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	249	.87	247	.387
Hours Earned after First Year of College	Equal Variances Not Assumed	249	2.52	149.38	.013

admits with *appeals granted* had a mean score of 2.270 (*s.d.*=.790). This indicates that the CSU athletes did not have significantly different GPAs than the conditional admits with appeals granted. The value of the *hours earned after the first year of college* was also not found to be significantly different between the *type of conditional admit* groups ($t(247)=.93, p=.354$). The *CSU athletes* had a mean score of 22.510 (*s.d.*=6.810) while the conditional admits with *appeals granted* had a mean score of 21.27 (*s.d.*=8.00). This indicates that the CSU athletes did not have a significantly different number of earned credit hours than the conditional admits with appeals granted (see Table 18).

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *yes* and *no* values of the *earned college credit hours prior to college* category (see Table 19). The value of the *CSU GPA after the first year of college* was not

Table 18

Independent Samples t-Test, Type of Conditional Admit and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	249	-1.50	247	.135
Hours Earned after First Year of College	Equal Variances Assumed	249	.93	247	.354

found to be significantly different between the *earned college credit hours prior to college* groups ($t(247)=-.47, p=.015$). The *yes* values had a mean score of 2.490 ($s.d.=.640$) while the *no* values had a mean score of 2.180 ($s.d.=.790$). This indicates that the students who earned college credit hours prior to college did not have significantly different GPAs than those who did not earn college credit hours prior to college. The value of the *hours earned after the first year of college* also was not found to be significantly different between the *earned college credit hours prior to college* groups ($t(247)=1.86, p=.064$). The *yes* values had a mean score of 23.450 ($s.d.=6.580$) while the *no* values had a mean score of 21.050 ($s.d.=7.990$). This indicates that the students who earned college credit hours prior to college did not have a significantly different number of earned credit hours than those who did not earn college credit hours prior to college.

Table 19

Independent Samples t-Test, Earned College Credit Hours Prior to College and First Year Academic Success

First Year Academic Success	Equal Variance Indicator	<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances Assumed	249	2.45	247	.015
Hours Earned after First Year of College	Equal Variances Assumed	249	1.86	247	.064

For a summary of independent samples *t*-tests applied to Research Question Two, see Figure 4.

Student Demographic Factors, First Year Academic Success, Groups of More Than Two

Second, the student demographic factor (category independent variable) containing groups of two or more was compared with the first year academic success (independent variables). A one-way ANOVA was used to test for *CSU GPA after the first year of college* differences among the four groups of *geographic origin locations* (see Table 20).

Summary of Student Demographic Factors – First Year Academic Success (Groups of Two) Independent Samples <i>t</i> -Tests

Group	GPA after the first year of college		Hours earned after the first year of college	
	Mean	<i>sd</i>	Mean	<i>sd</i>
Females*	2.394	.723	22.900	6.772
Males	2.109	.793	20.330	8.390
Non-minority	2.281	.764	21.620	7.783
Minority	2.114	.756	21.680	7.329
CSU athlete	2.209	.717	22.690	7.080
Non-CSU athlete	2.260	.810	20.610	8.190
Public high school	2.166	.799	20.860	8.030
Private high school	2.370	.078	22.510	7.120
Application fee waiver	NA	NA	NA	NA
No application fee waiver	NA	NA	NA	NA
Athlete in high school*	2.303	.703	23.310	7.006
Not athlete in high school	2.209	.801	20.730	8.002
Athlete conditional admit	2.070	.670	22.510	6.810
Appeal granted conditional admit	2.270	.790	21.270	8.000
Earned college credit prior to college	2.490	.640	23.450	6.580
Did not earn college credit prior to college	2.180	.790	21.050	7.990

Figure 4. Summary of Student Demographic Factors – First Year Academic Success (Groups of Two) Independent Samples *t*-Tests.

Note. * Indicates significantly higher mean than other subgroup.

Differences for *geographic origin locations* differed significantly across the four groups, $F(3, 244) = 5.045, p = .002$. A one-way ANOVA was used to test also for *hours earned after the first year of college* differences among the four groups of *geographic origin locations*. Differences for *geographic origin locations* differed significantly across the four groups, $F(3, 244) = 5.045, p = .002$. This indicates that both one-way ANOVA analyses were significant.

When comparing the *geographic origin location* independent variable with the dependent variable of *CSU GPA after the first year of college*, the 24-county area students had a significantly lower GPA than the *other in-state* students (*mean difference* = -4005, $p = .012$). When using an alpha level of .05 for significance, the *other in-state*

Table 20

One-Way ANOVA, Geographic Origin Location, First Year Academic Success (N=247)

First Year Academic Success	Groups	Sum of Squares	df	Mean Square	F	Sig.
CSU GPA after First Year of College	Between Groups	8.673	3	2.891	5.045	.002
	Within Groups	139.834	244	.573		
	Total	148.507	247			
Hours Earned after First Year of College	Between Groups	846.940	3	282.313	4.842	.003
	Within Groups	14226.657	244	58.306		
	Total	15073.597	247			

students had a significantly higher GPA than the *out-of-state* (mean difference = .376, $p=.039$) students as well (see Table 21).

Table 21

One-Way ANOVA Table of Means, Geographic Origin Location, CSU GPA after First Year of College

Geographic Origin	Mean	N	Sd
24 County Area	1.939	35	.94485
Other In-State*	2.340	184	.729
Out-Of-State	1.963	28	.6732

Note. * indicates significantly higher mean than the other two groups

When comparing the *geographic origin location* independent variable with the dependent variable of *earned college credit hours prior to college*, the *other in-state* students had a significantly higher GPA than the *24-county area* (*mean difference* = 4.367, $p=.006$) students. No other means differed significantly (see Table 22).

Table 22

One-Way ANOVA Table of Means, Geographic Origin Location, Earned College Credit Hours Prior to College

Geographic Origin	Mean	N	sd
24 County Area	17.94	35	9.870
Other In-State*	22.31	184	7.206
Out-Of-State	20.86	28	7.230

Note. * indicates significantly higher mean than the 24 county area

Student Demographic Factors, First to Second Year Retention

Third, the student demographic factors (category independent variables) were compared with the *first to second year retention* factor (independent variable). Cross-tabs with chi-square analyses were applied. A chi-square test of independence was calculated comparing the number of *females* and *males* within the *sex* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=.892, p=.345$]. Students within the *sex* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the number of *non-minorities* and *minorities* within the *ethnicity* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=.261,$

Table 23

Pearson Chi-Square Test of Independence, First to Second Year Retention

Student Demographic Factor	<i>N</i>	Value	<i>df</i>	<i>Asymp. Sig.</i> (2-sided)
Sex	249	.892	1	.345
Ethnicity	235	.261	1	.610
CSU Athlete	249	3.497	1	.061
Type of High School	244	.211	1	.646
Application Fee Waiver	249	.234	1	.629
Athletic Participation in High School	249	1.567	1	.211
Type of Conditional Admit	249	1.998	1	.157
Geographic Origin Location	248	4.579	3	.205
Earned College Credit Prior to College	249	4.401	1	.036

$p=.610$]. Students within the *ethnicity* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the number of *yes* and *no* values within the *CSU athlete* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=3.497, p=.061$]. Students within the *CSU athlete* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the *public* and *private* high school values within the *type of high school* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=.211, p=.646$]. Students within the *type of high school* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the number of *yes* and *no* values within the *application fee waiver* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=.234, p=.629$]. Students within the *application fee waiver* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the number of *yes* and *no* values within the *athletic participation in high school* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=1.567, p=.211$]. Students within the *athletic participation in high school* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the number of *CSU athlete* and *appeal granted* values within the *type of conditional admit* category with the *first to second year retention* dependent variable. A significant interaction was not found

[$X^2(1)=1.998, p=.157$]. Students within the *type of conditional admit* category were proportionately dispersed between the type of retention groups (see Table 23).

A chi-square test of independence was calculated comparing the *24 county service area, other in-state, out-of-state, and another country* values within the *geographic origin location* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(3)=4.579, p=.205$]. Students within the *geographic origin location* category were proportionately dispersed between the retention groups (see Table 23).

A chi-square test of independence was calculated comparing the number of *yes* and *no* values within the *earned college credit prior to college* category with the *first to second year retention* dependent variable. A significant interaction was not found [$X^2(1)=4.401, p=.036$]. Students within the *earned college credit prior to college* category were proportionately dispersed between the retention groups (see Table 23).

Research Question Two Summary

To answer the second research question, independent samples *t*-tests, a one-way ANOVA, and cross-tabs with chi-square were applied to look for differences between groups of students based on demographic factors in their first year academic success and college retention. The results of the independent samples *t*-tests and a one-way ANOVA, used to compare the independent variables with interval dependent variables of academic success, indicated that *sex, athletic participation in high school, and geographic origin location* had a significant differentiation.

In particular, the value of the *CSU GPA after the first year of college* and *hours earned after the first year of college* was found to be significantly different between the

sex groups. This indicates that the females had significantly higher GPAs and earned credit hours than the males. In regard to the *geographic origin location* variable, students in the *other in-state group* had a higher *GPA after the first year of college* and higher number of *earned credit hours after the first year* than students in other *geographic origin location* groups. In regard to the *athletic participation in high school* variable, students who participated in athletics in high school had a higher number of *earned credit hours after the first year* than students who did not. The cross-tabs with chi square analyses revealed no significant relationship between the student demographic factors and college retention variable.

Research Question Three

To determine what academic admission factors of conditionally admitted students best predict first year academic success based on the student demographic factors that most significantly differentiate first year academic success, a forward linear regression model was applied. This model compared the sub groups of the academic admission factors containing the most significant differentiation with both the *GPA after the first year of college* and *hours earned after the first year of college*. Forward selection is a version of the model that enters the variables into the model one at a time in an order determined by the strength of their correlation with the criterion variable. As each variable is added, it is assessed. Those variables that do not significantly add to the success of the model are excluded (Field, 2009).

Sex Category, Female Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of*

college for the *female* grouping of the *sex* category. Regression results indicated that the final model demonstrated significant prediction of *earned credit hours after the first year of college* ($R = .655$, $R^2 = .429$, $R_{adj} = .396$, $F(2)$, $p < .001$, $S_{est} = 5.957$). This model accounts for 42.9% (R^2) of the variance in the *earned credit hours after the first year of college of females*.

When *earned credit hours after the first year of college* was predicted at an alpha level of .05, it was found that *high school core curriculum GPA* ($Beta = .564$, $Std Error = 3.109$, $p = .003$) and *high school GPA* ($Beta = -.373$, $Std Error = 3.745$, $p = .043$) were significant predictors. *ACT composite* ($Beta = .053$, $p = .631$), *ACT math* ($Beta = .059$, $p = .576$), *ACT reading* ($Beta = -.002$, $p = .839$), *ACT English* ($Beta = .170$, $p = .124$), *ACT science* ($Beta = -.038$, $p = .719$), *class rank percentile* ($Beta = .079$, $p = .573$), *high school class size* ($Beta = -.057$, $p = .598$), *high school GPA* ($Beta = .258$, $p = .208$), *number of core curriculum courses taken during senior year of high school* ($Beta = .049$, $p = .639$), *number of math units that met the core* ($Beta = -.036$, $p = .735$), and *GPA of completed credit prior to college* ($Beta = .163$, $p = .144$) did not add significantly to the prediction model (see Table 24). The overall model fit was $R^2 = 0.429$.

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *female* grouping of the *sex* category. Regression results indicated that the final model demonstrated significant prediction of *GPA after the first year of college* ($R = .375$, $R^2 = .140$, $R_{adj} = .120$, $F(2)$, $p = .002$, $S_{est} = .657$). This model accounts for 14% (R^2) of the variance in the *GPA after the first year of college of females*.

Table 24

Forward Linear Regression of Sex-Females and Earned Credit Hours after First Year of College (N=111)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	20.110	6.410		3.137	.002
High School Core Curriculum GPA	9.672	3.109	.564	3.111	.003
High School GPA	-7.693	3.745	-.373	-2.054	.043
GPA of Completed Credit Prior to College			.163	1.473	.144
ACT Composite			.053	.482	.631
ACT Math			.059	.561	.576
ACT Reading			-.022	-.203	.839
ACT English			.170	1.555	.124
ACT Science			-.038	-.361	.719
Class Rank Percentile			.079	.566	.573
Class Size			-.057	-.530	.598
No. of Core Curriculum Courses Taken Senior Year			.049	.470	.639
No. of Math Units Met Core			-.036	-.340	.735

When *GPA after the first year of college* was predicted at an alpha level of .05, it was found that *high school core curriculum GPA* (*Beta* = .344, *Std Error* = .203, *p* = .002) and *ACT English* (*Beta* = .265, *Std Error* = .152, *p* = .005) were significant predictors. *ACT composite* (*Beta* = -.077, *p* = .594), *ACT math* (*Beta* = -.039, *p* = .716),

ACT reading ($Beta = .034, p = .749$), *ACT science* ($Beta = -.079, p = .449$), *class rank percentile* ($Beta = .004, p = .973$), *high school class size* ($Beta = -.046, p = .661$), *high school GPA* ($Beta = -.067, p = .719$), *number of core curriculum courses taken during the senior year of high school* ($Beta = .060, p = .564$), *number of math units that met the core* ($Beta = -.048, p = .650$), and *GPA of completed credit prior to college* ($Beta = .121, p = .274$) did not add significantly to the prediction model (see Table 25). The overall model fit was $R^2 = 0.140$.

Sex Category, Male Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of college* for the *male* grouping of the *sex* category. Regression results indicated that the final model demonstrated significant prediction of *earned credit hours after the first year of college* ($R = .358, R^2 = .128, R_{adj} = .111, F(2), p = .001, S_{est} = 7.830$). This model accounts for 12.8% (R^2) of the variance in the *earned credit hours after the first year of college of males*.

When *earned credit hours after the first year of college* was predicted at an alpha level of .05, it was found that *high school GPA* ($Beta = .285, Std Error = 2.182, p = .002$) and the *number of math units that met the core* ($Beta = .227, Std Error = .950, p = .014$) were significant predictors. *ACT composite* ($Beta = -.006, p = .948$), *ACT math* ($Beta = -.135, p = .145$), *ACT reading* ($Beta = -.054, p = .560$), *ACT English* ($Beta = .050, p = .603$), *ACT science* ($Beta = .066, p = .478$), *class rank percentile* ($Beta = -.219, p = .090$), *high school class size* ($Beta = .084, p = .355$), *number of core curriculum courses taken during senior year of high school* ($Beta = -.175, p = .081$), *high school core curriculum*

Table 25

*Forward Linear Regression of Sex-Females and GPA after the First Year of College**(N=111)*

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-.673	.860		-.783	.436
High School Core Curriculum GPA	.660	.203	.344	3.256	.002
ACT English	.071	.028	.265	2.514	.014
GPA of Completed Credit Prior to College			.121	1.101	.274
ACT Composite			-.077	-.535	.594
ACT Math			-.039	-.365	.716
ACT Reading			.034	.321	.749
ACT Science			-.079	-.760	.449
Class Rank Percentile			.004	.033	.973
Class Size			-.046	-.440	.661
High School GPA			-.067	-.361	.719
No. of Core Curriculum Courses Taken Senior Year			.060	.580	.564
No. of Math Units Met Core			-.048	-.455	.650

GPA (*Beta* = -.138, *p* = .329), and *GPA of completed credit prior to college* (*Beta* = .047, *p* = .612) did not add significantly to the prediction model (see Table 26). The overall model fit was $R^2 = 0.128$.

Table 26

Forward Linear Regression of Sex-Males and Earned Credit Hours after First Year of College (N=138)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-7.592	7.159		-1.060	.782
High School GPA	6.882	2.182	.285	3.154	.002
No. of Math Units Met Core	2.382	.950	.227	2.508	.014
GPA of Completed Credit Prior to College			.047	.509	.612
ACT Composite			-.006	-.065	.948
ACT Math			-.135	-1.469	.145
ACT Reading			-.054	-.585	.560
ACT English			.050	.522	.603
ACT Science			.066	.713	.478
Class Rank Percentile			-.219	-1.711	.090
Class Size			.084	.929	.355
No. of Core Curriculum Courses Taken Senior Year			-.175	-1.762	.081
High School Core Curriculum GPA			.138	.980	.329

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *male* grouping of the *sex* category. Regression results indicated that the final model demonstrated significant prediction of *GPA after the first year of college* ($R = .356$, $R^2 =$

.127, $R_{adj} = .119$, $F(2)$, $p < .001$, $S_{est} = .733$). This model accounts for 12.7% (R^2) of the variance in the *GPA after the first year of college of males*.

When *GPA after the first year of college* was predicted at an alpha level of .05, it was found that *high school GPA* ($Beta = .809$, $Std Error = .204$, $p < .001$) was a significant predictor. *ACT composite* ($Beta = -.021$, $p = .831$), *ACT math* ($Beta = -.110$, $p = .229$), *ACT reading* ($Beta = .021$, $p = .822$), *ACT English* ($Beta = .136$, $p = .155$), *ACT science* ($Beta = -.001$, $p = .988$), *class rank percentile* ($Beta = -.165$, $p = .201$), *high school class size* ($Beta = .134$, $p = .137$), *number of core curriculum courses taken during senior year of high school* ($Beta = .043$, $p = .639$), *high school core curriculum GPA* ($Beta = .092$, $p = .511$), *number of math units that met the core* ($Beta = .156$, $p = .083$) and *GPA of completed credit prior to college* ($Beta = .102$, $p = .261$) did not add significantly to the prediction model (see Table 27). The overall model fit was $R^2 = 0.127$.

Geographic Origin Location Category, 24 County Area Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of college* for the *24 county area* grouping of the *geographic origin location* category.

Regression results indicated that the final model demonstrated significant prediction of *earned credit hours after the first year of college* ($R = .586$, $R^2 = .343$, $R_{adj} = .298$, $F(2)$, $p = .002$, $S_{est} = 8.336$). This model accounts for 34.3% (R^2) of the variance in the *earned credit hours after the first year of college* of students from the *24 county area*.

When *earned credit hours after the first year of college* was predicted at an alpha level of .05, it was found that *high school GPA* ($Beta = .445$, $Std Error = 5.822$, $p = .006$)

Table 27

*Forward Linear Regression of Sex-Males and GPA after the First Year of College**(N=138)*

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-.131	.573		-.228	.820
High School GPA	.809	.204	.356	3.965	<.001
GPA of Completed Credit Prior to College			.102	1.130	.261
ACT Composite			.021	.226	.821
ACT Math			-.110	-1.210	.229
ACT Reading			.021	.225	.822
ACT English			.136	1.432	.155
ACT Science			-.001	-.014	.988
Class Rank Percentile			-.165	-1.286	.201
Class Size			.134	1.498	.137
No. of Core Curriculum Courses Taken Senior Year			.043	.471	.639
High School Core Curriculum GPA			.093	.660	.511
No. of Math Units Met Core			.156	1.752	.083

and *GPA of completed credit prior to college* ($Beta = .435$, $Std Error = .942$, $p = .008$) were significant predictors (see Table 28). *ACT composite* ($Beta = .079$, $p = .671$), *ACT math* ($Beta = .166$, $p = .323$), *ACT reading* ($Beta = -.217$, $p = .228$), *ACT English* ($Beta = .024$, $p = .889$), *ACT science* ($Beta = .049$, $p = .758$), *class rank percentile* ($Beta = -.005$,

Table 28

Forward Linear Regression of Geographic Origin-24 County Area and Earned Credit Hours after First Year of College (N=35)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-35.947	17.794		-2.020	.053
High School GPA	17.110	5.822	.445	2.939	.006
GPA of Completed Credit Prior to College	2.705	.942	.435	2.870	.008
ACT Composite			.079	.430	.671
ACT Math			.166	1.006	.323
ACT Reading			-.217	-1.234	.228
ACT English			.024	.140	.889
ACT Science			.049	.312	.758
Class Rank Percentile			-.005	-.025	.980
Class Size			.009	.058	.954
No. of Core Curriculum Courses Taken Senior Year			-.054	-.343	.734
High School Core Curriculum GPA			-.024	-.100	.921
No. of Math Units Met Core			.141	.906	.372

p = .980), high school class size (Beta = .009, p = .954), number of core curriculum courses taken during senior year of high school (Beta = -.054, p = .834), high school core curriculum GPA (Beta = -.024, p = .921), and number of math units that met the

core ($Beta = .141, p = .372$) did not add significantly to the prediction model. The overall model fit was $R^2 = 0.343$.

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *24 county area* grouping of the *geographic origin location* category. Regression results indicated that the final model demonstrated significant prediction of *GPA after the first year of college* ($R = .556, R^2 = .309, R_{adj} = .261, F(2), p = .005, S_{est} = .833$). This model accounts for 30.9% (R^2) of the variance in the earned *GPA after the first year of college* of students from the *24 county area*.

When *GPA after the first year of college* was predicted at an alpha level of .05, *GPA of completed credit prior to college* ($Beta = .418, Std Error = .094, p = .012$) and *high school GPA* ($Beta = .417, Std Error = .582, p = .012$) were significant predictors. *ACT composite* ($Beta = .148, p = .436$), *ACT math* ($Beta = .120, p = .486$), *ACT reading* ($Beta = -.067, p = .721$), *ACT English* ($Beta = .110, p = .534$), *ACT science* ($Beta = .025, p = .879$), *class rank percentile* ($Beta = .086, p = .645$), *high school class size* ($Beta = .091, p = .566$), *number of core curriculum courses taken during senior year of high school* ($Beta = -.125, p = .442$), *high school core curriculum GPA* ($Beta = .010, p = .967$), and *number of math units that met the core* ($Beta = .069, p = .671$) did not add significantly to the prediction model (see Table 29). The overall model fit was $R^2 = 0.309$.

Geographic Origin Location Category, Other County in State Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of*

Table 29

Forward Linear Regression of Geographic Origin-24 County Area and GPA after the First Year of College (N=35)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-3.003	1.777		-1.690	.102
High School GPA	1.561	.582	.417	2.685	.012
GPA of Completed Credit Prior to College	.253	.094	.417	2.686	.012
ACT Composite			.148	.791	.436
ACT Math			.120	.706	.486
ACT Reading			-.067	.361	.721
ACT English			.110	.630	.534
ACT Science			.025	.154	.879
Class Rank Percentile			.086	.465	.645
Class Size			.091	.581	.566
No. of Core Curriculum Courses Taken Senior Year			-.125	-.779	.442
High School Core Curriculum GPA			.010	.042	.967
No. of Math Units Met Core			.069	.429	.671

college for the other county in state grouping of the *geographic origin location* category.

Regression results indicated that the final model demonstrated significant prediction of *earned credit hours after the first year of college* ($R = .365$, $R^2 = .133$, $R_{adj} = .127$, $F(1)$,

$p < .001$, $S_{est} = 6.401$). This model accounts for 13.3% (R^2) of the variance in the *earned credit hours after the first year of college* of students from the *other counties in the state*.

When *earned credit hours after the first year of college* was predicted at an alpha level of .05, it was found that *high school core curriculum GPA* ($Beta = .365$, Std Error = 1.406, $p < .001$) was a significant predictor. *GPA of completed credit prior to college* ($Beta = .037$, $p = .649$), *ACT composite* ($Beta = -.003$, $p = .970$), *ACT math* ($Beta = -.100$, $p = .199$), *ACT reading* ($Beta = .004$, $p = .957$), *ACT English* ($Beta = .091$, $p = .271$), *ACT science* ($Beta = -.025$, $p = .746$), *class rank percentile* ($Beta = -.091$, $p = .305$), *high school class size* ($Beta = .028$, $p = .724$), *high school GPA* ($Beta = .024$, $p = .849$), *number of core curriculum courses taken during senior year of high school* ($Beta = .032$, $p = .677$), and *number of math units that met the core* ($Beta = .150$, $p = .053$) did not add significantly to the prediction model (see Table 30). The overall model fit was $R^2 = 0.133$.

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *other county in state* grouping of the *geographic origin location* category. Regression results indicated that the final model demonstrated significant prediction of *earned credit GPA after the first year of college* ($R = .406$, $R^2 = .165$, $R_{adj} = .153$, $F(2)$, $p < .001$, $S_{est} = .637$). This model accounts for 16.5% (R^2) of the variance in the *earned GPA after the first year of college* of students from the *other counties in the state*.

When *earned credit hours after the first year of college* was predicted at an alpha level of .05, it was found that *high school core curriculum GPA* ($Beta = .428$, Std Error = .148, $p < .001$) and *ACT English* ($Beta = .178$, Std Error = .019, $p = .029$) were

Table 30

Forward Linear Regression of Geographic Origin-Other County in State and Earned Credit Hours after First Year of College (N=184)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	5.434	3.647		1.490	.138
High School Core Curriculum GPA	6.611	1.406	.365	4.702	<.001
GPA of Completed Credit Prior to College			.037	.457	.649
ACT Composite			-.003	-.038	.970
ACT Math			-.100	-1.291	.199
ACT Reading			.004	.054	.957
ACT English			.091	1.104	.271
ACT Science			-.025	-.325	.746
Class Rank Percentile			-.091	-1.029	.305
Class Size			.028	.354	.724
High School GPA			.024	.191	.849
No. of Core Curriculum Courses Taken Senior Year			.032	.417	.677
No. of Math Units Met Core			.150	1.948	.053

significant predictors. *GPA of completed credit prior to college* ($Beta = .069, p = .389$), *ACT composite* ($Beta = -.120, p = .255$), *ACT math* ($Beta = -.077, p = .317$), *ACT reading* ($Beta = .029, p = .720$), *ACT science* ($Beta = -.073, p = .349$), *class rank percentile* ($Beta = -.045, p = .615$), *high school class size* ($Beta = .024, p = .756$), *high*

school GPA ($Beta = .246, p = .055$), number of core curriculum courses taken during senior year of high school ($Beta = .113, p = .142$), and number of math units that met the core ($Beta = .074, p = .337$) did not add significantly to the prediction model (see Table 31). The overall model fit was $R^2 = 0.165$.

Table 31

Forward Linear Regression of Geographic Origin-Other County in State and GPA after the First Year of College (N=183)

Academic Admission Factors	<i>B</i>	<i>Std Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
(Constant)	-.443	.602		-.736	.463
High School Core Curriculum GPA	.782	.148	.427	5.285	<.001
ACT English	.042	.019	.178	2.208	.029
GPA of Completed Credit Prior to College			.069	.864	.389
ACT Composite			-.120	-1.143	.255
ACT Math			-.077	-1.005	.317
ACT Reading			.029	.359	.720
ACT Science			-.073	-.939	.349
Class Rank Percentile			-.045	-.504	.615
Class Size			.024	.312	.756
High School GPA			.246	1.937	.055
No. of Core Curriculum Courses Taken Senior Year			.113	1.477	.142
No. of Math Units Met Core			.074	.963	.337

Geographic Origin Location Category, Out-of-State Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of college* for the *out-of-state* grouping of the *geographic origin location* category.

Regression results indicated that none of the variables could be used to create a final model.

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *out-of-state* grouping of the *geographic origin location* category. Regression results indicated that none of the variables could be used to create a final model.

Athletic Participation in High School Category, Yes Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of college* for the *yes* grouping of the *athletic participation in high school* category.

Regression results indicated that none of the variables could be used to create a final model.

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *yes* grouping of the *athletic participation in high school* category. Regression results indicated that none of the variables could be used to create a final model.

Athletic Participation in High School Category, No Group

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *earned credit hours after the first year of*

college for the *no* grouping of the *athletic participation in high school* category.

Regression results indicated that none of the variables could be used to create a final model.

Forward linear regression (Field, 2009) was conducted to determine the accuracy of academic admission factors as predictors of *GPA after the first year of college* for the *no* grouping of the *athletic participation in high school* category. Regression results indicated that none of the variables could be used to create a final model.

Geographic Origin Location Category, Another Country Group

The sample included only one student from another county. Therefore, a linear regression analysis was not run against this group because of the small sample size (Field, 2009).

Research Question Three Summary

To answer the third research question, a forward linear regression analysis was applied to determine the combination of academic admission factors that best predict first year academic success based on the student demographic factors that most significantly differentiate first year success. Thus, the analysis compared the interval independent variables with the interval dependent variables. The results for the *female* group of the *sex* category indicated that the *high school core curriculum GPA* was a significant predictor of both *earned credit hours after the first year of college* and *GPA after the first year of college*, while *high school GPA* was a significant predictor of *earned credit hours after the first year of college* and *ACT English* was a significant predictor of *GPA after the first year of college*. The results for the *male* group of the *sex* category indicated that the *high school GPA* was a significant predictor of both *earned credit hours after the first*

year of college and *GPA after the first year of college*, while the number of math units that met the core was a significant predictor of *GPA after the first year of college*.

The results for the *24 county area* group of the *geographic origin location* category indicated that both *high school GPA* and *GPA of completed credit prior to college* were significant predictors of *earned credit hours after the first year of college* and *GPA after the first year of college*. The results for the *other county in state* group of the *geographic origin location* category indicated that the *high school core curriculum GPA* was a significant predictor of *earned credit hours after the first year of college* and *GPA after the first year of college*, while the ACT English was a significant predictor of *GPA after the first year of college*. The results for the *out-of-state* group of the *geographic origin location* and both *yes* and *no* groups of the *athletic participation in high school* categories indicated that none of the variables could be used to create a final model for both *credit hours after the first year of college* and *GPA after the first year of college* (see Figure 5).

Research Question Four

To determine if there were differences in first year academic success between students who were and were not retained from the first to the second year of college, an independent samples *t*-test was applied.

An independent samples *t*-test analysis was calculated to determine if the *CSU GPA after the first year of college* and *hours earned after the first year of college* were different for the *yes* and *no* values of the *first to second year retention* category. The value of the *CSU GPA after the first year of college* was found to be significantly different between the *first to second year retention* groups ($t(247)=9.243, p<.001$). The

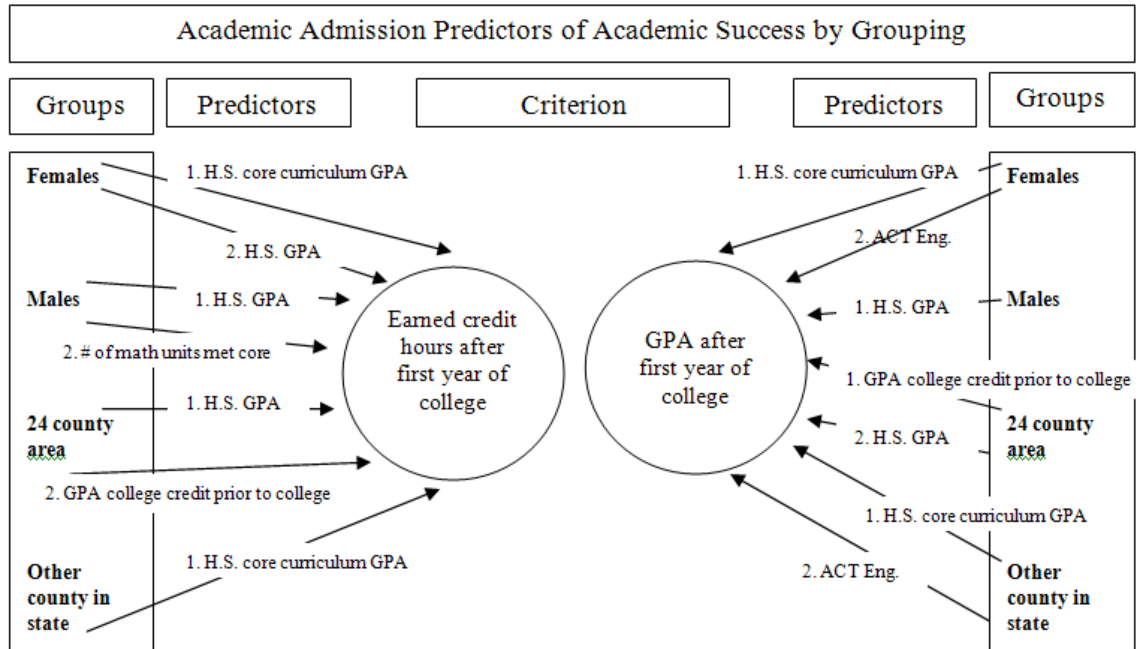


Figure 5. Academic Admission Predictors of Academic Success by Grouping

yes values had a mean score of 2.534 ($s.d.=.501$) while the no values had a mean score of 1.720 ($s.d.=.888$). This indicates that the students who were retained had significantly different GPAs than the students who were not retained.

The value of the *hours earned after the first year of college* also was found to be significantly different between the *first to second year retention* groups ($t(247)=12.031$, $p<.001$). The yes values had a mean score of 25.07 ($s.d.=3.903$) while the no values had a mean score of 15.24 ($s.d.=8.997$). This indicates that the students who were retained had a significantly different number of earned credit hours than the students who were not retained (see Table 32).

In addition, the degree of correlation between the two interval dependent variables, *GPA after first year of college* and *earned hours after first year of college*, was

Table 32

Independent Samples t-Test, First to Second Year College Retention and First Year Academic Success

		<i>N</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
CSU GPA after First Year of College	Equal Variances	249	8.030	123.658	<.001
	Not Assumed				
Hours Earned after First Year of College	Equal Variances	249	9.997	110.283	<.001
	Not Assumed				

analyzed. The results indicated a significant correlation (Pearson Correlation = .819, $p < .001$), with a shared variance of 67%.

Research Question Four Summary

To answer the fourth research question, an independent samples *t*-test was applied to look for differences in first year academic success between students who are and are not retained from the first to second year. The results indicated that both of the *first year academic success* variables, *GPA after first year of college* and *earned hours after first year of college*, had a significant differentiation when compared to the *first to second year college retention* variable.

Summary

Recent literature has focused on the factors used in university admission determinations (Geiser, 2009; Schmidt, 2008) and the first-year college experience

(Feldman, 2005; Upcraft, Gardner & Barefoot, 2005). However, a deficit in information regarding the items that best predict a conditionally admitted student's academic success during the first year exists. To provide an empirical perspective to the admission appeal decision-makers, this study objectively compared predictors collected at the time of admission with predetermined dependent variables which define academic success.

The first research question was asked to determine what academic admission factors of conditionally admitted students best predict first year academic success. It was analyzed using forward linear regression to determine the combination of independent variables that best predict the dependent variables. The results indicated that *high school core curriculum GPA* and *number of core curriculum courses taken during the senior year of high school* were significant predictors of *earned credit hours after the first year of college*. The academic admission variables of *ACT composite*, *ACT math*, *ACT reading*, *ACT English*, *ACT science*, *class rank percentile*, *high school class size*, *high school GPA*, *number of math units that met the core*, and *GPA of completed credit prior to college* did not add significantly to the prediction model.

The results of the analysis also indicated that both *ACT English* and *high school core curriculum GPA* were significant predictors of *GPA after the first year of college*. The academic admission variables of *ACT composite*, *ACT math*, *ACT reading*, *ACT science*, *class rank percentile*, *high school class size*, *high school GPA*, *number of core curriculum courses taken during senior year of high school*, *number of math units that met the core*, and *GPA of completed credit prior to college* did not add significantly to the prediction model.

The second research question was presented to look for differences between groups of students based on demographic factors in their first year academic success and college retention. It was analyzed using independent samples *t*-tests and a one-way ANOVA to compare with the interval dependent variables and cross-tabs with chi-square to compare with the category dependent variable. The results indicated through the independent samples *t*-tests and one-way ANOVA that both *sex* and *geographic origin location* had a significant differentiation when compared to the academic success variables.

In particular, the value of the *CSU GPA after the first year of college* and *hours earned after the first year of college* was found to be significantly different between the *sex* groups. This indicates that the females had significantly higher GPAs and earned credit hours than the males. In regard to the *geographic origin location* variable, students in the *other in-state group* had a higher *GPA after the first year of college* and higher number of *earned credit hours after the first year* than students in other *geographic origin location* groups. In regard to the *athletic participation in high school* variable, students who participated in athletics in high school had a higher number of *earned credit hours after the first year* than students who did not. The cross-tabs with chi square analyses revealed no significant relationship between the student demographic factors and college retention variable.

The third research question was asked to determine, based on the student demographic factors that most significantly differentiate first year academic success, what academic admission factors of conditionally admitted students best predict academic success. It was analyzed using forward linear regression to determine the

combination of independent variables that best predict the dependent variables. The results for the *female* group of the *sex* category indicated that the *high school core curriculum GPA* was a significant predictor of both *earned credit hours after the first year of college* and *GPA after the first year of college*, while *high school GPA* was a significant predictor of *earned credit hours after the first year of college* and *ACT English* was a significant predictor of *GPA after the first year of college*. The results for the *male* group of the *sex* category indicated that the *high school GPA* was a significant predictor of both *earned credit hours after the first year of college* and *GPA after the first year of college*, while the number of math units that met the core was a significant predictor of *GPA after the first year of college*.

The results for the *24 county area* group of the *geographic origin location* category indicated that both *high school GPA* and *GPA of completed credit prior to college* were significant predictors of *earned credit hours after the first year of college* and *GPA after the first year of college*. The results for the *other county in state* group of the *geographic origin location* category indicated that the *high school core curriculum GPA* was a significant predictor of *earned credit hours after the first year of college* and *GPA after the first year of college*, while the *ACT English* was a significant predictor of *GPA after the first year of college*. The results for the *out-of-state* group of the *geographic origin location* and both *yes* and *no* groups of the *athletic participation in high school* categories indicated that none of the variables could be used to create a final model for both *credit hours after the first year of college* and *GPA after the first year of college*.

The fourth research question was presented to look for differences in first year academic success between students who are and are not retained from the first to second year. It was analyzed by using independent samples *t*-tests to compare the grouping variable with the test variables. The results indicated through the independent samples *t*-tests that both *first year academic success* variables had a significant differentiation when compared to the *first to second year college retention* variable.

In particular, the value of the *CSU GPA after the first year of college* was found to be significantly different between the *first to second year retention* groups. This indicates that the students who were retained had significantly different GPAs than the students who were not retained. Additionally, the value of the *hours earned after the first year of college* also was found to be significantly different between the *first to second year retention* groups. This indicates that the students who were retained had a significantly different number of earned credit hours than the students who were not retained.

Chapters One, Two, and Three provided the groundwork for this study by presenting the purpose of the study, conceptual underpinnings, research questions, related literature, and the design and methodology utilized in the research. In Chapter Four, the data collection and analysis results were presented for each research question. Chapter Five will provide a summary and conclusions, implications for policy makers within education, especially university admission stakeholders, and recommendations for future research.

CHAPTER FIVE

DISCUSSION

Introduction

Student recruitment and retention have been an ongoing emphasis within higher education (Carey, 2005; Heldman, 2008; Lederman, 2009). In particular, the conditional admittance of students (i.e., accepting students who do not meet the stated admission requirements) is of interest in how it relates to the areas of (a) general policy (Fowler, 2009); (b) admission policies, criteria, and decisions (Hoxby, 2009, Keller & Hoover, 2009); (c) the high school to college transition and learning (Bruffee, 1999; Chickering, 2006; Chickering & Kuh, 2005; Nonaka, 1994) ; and (d) academic success and college retention (Kretchmar, 2006; Upcraft, Gardner, Barefoot, & associates, 2005; Vivo & Franco, 2008). In response to these issues, university administrators have considered various best practices for predicting a potential conditionally admitted student's academic success at the institution. This convention is applicable to educators involved in admission appeal processing and various stakeholders who debate about the decision, especially when evaluating a multitude of factors submitted by the student.

Additionally, literature indicates criticism of certain measures of university admission requirements, especially standardized tests (Brown, 1999; Butler, 1994; Hoover, 2009; Keller & Hoover, 2009; Hoxby, 2009; Kretchmar 2006; Nathan, 1995; Sadler, 2007). Hoover's study articulated this concern by reporting colleges that were becoming test-optional and treating college admissions as more of an art than a science. Moreover, Clark, Rothstein, and Schanzenbach's (2009) study of selection bias in college admission test scores observed a high correlation between standardized test scores and

average latent scores within the study. Questions exist regarding the validity and reliability of various standardized measures used within the college admission search.

Practitioners at four year, public universities are being required to make decisions regarding the admittance of first-time freshmen who do not meet the stated admission requirements of the college (Keller & Hoover; Kretchmar, 2006). The university admission process helps to reveal the issues of policy, the high school to college transition, academic success, and retention. It is also significantly influenced by policy. Consistency between formal policy and informal practices is difficult to achieve (Fowler, 2009). When the admission policy is put into practice, practitioners are sometimes required to use subjective measures for decision making. This is especially the case in situations when the applicant does not meet the requirements of the policy.

In this case, the practitioner must evaluate additional information when making a decision about a possible exception to the policy. At this point, factors of the transition period from high school to college become relevant (Astin, 1993; Scholssbert, Waters, & Goodman, 1995; Tinto, 1994). College decision makers ask questions such as, what experiences and factors did the student bring from high school to make him or her prepared for college? Which of these best predict college retention and academic success? Practitioners would benefit from empirical data to guide them when making these decisions. Accordingly, a deeper study of the related issues is necessary. The unsettled debate regarding the validity and reliability of accurate predictors for college admission, along with the significant rates of attrition for those students conditionally admitted to the university (Brown, 1999; Clark, Rothstein, & Schanzenbach 2009; Hoover, 2009; Hoxby, 2009; Sedlacek, 2004), helped to provide the groundwork for this

study regarding predictors of academic success and college retention for conditionally admitted students.

Conclusions

This study was designed to provide potential clarity of policy and practices to practitioners within public four-year universities who make decisions regarding the acceptance of students who do not meet the stated admission requirements. Research indicates a broad spectrum of debate regarding what admission and demographic factors best predict academic success and college retention (Kretchmar, 2006; Upcraft, Gardner, Barefoot, & associates, 2005; Vivo & Franco, 2008).

Additionally, the institution specifically involved in this study had confirmed higher failure rates of those conditionally admitted than those regularly admitted (see Figure 1). Thus, this study, an analysis of academic admission and student demographic factors that significantly predict first year academic success and college retention, was warranted. Using the frameworks of policy, student retention and academic success, and organizational and individual learning theories, four research questions were developed. Existing data through convenience sampling (Creswell, 2003) was used for the analyses.

Research Question One

The first research question was asked to determine what academic admission factors of conditionally admitted students best predict first year academic success. The results indicated that *high school core curriculum GPA* and *number of core curriculum courses taken during the senior year of high school* were significant predictors of *earned credit hours after the first year of college*. The academic admission variables of *ACT composite, ACT math, ACT reading, ACT English, ACT science, class rank percentile,*

high school class size, high school GPA, number of math units that met the core, and GPA of completed credit prior to college did not add significantly to the prediction model

The results of the analysis also indicated that both *high school core curriculum GPA* and *ACT English* were significant predictors of *GPA after the first year of college*. The academic admission variables of *ACT composite, ACT math, ACT reading, ACT science, class rank percentile, high school class size, high school GPA, number of core curriculum courses taken during senior year of high school, number of math units that met the core, and GPA of completed credit prior to college* did not add significantly to the prediction model.

Research Question Two

The second research question was asked to determine if there were differences between groups of students based on student demographic factors in their first year academic success and college retention. An examination of the results, using an alpha level of .01, found student demographic factors that contained significant differentiation, *sex* and *geographic origin location*, when compared to the *CSU GPA after the first year of college* first year academic success dependent variable. However, at an alpha level of .05, *type of high school* and *earned college credit prior to college* also revealed a significant difference when compared to *CSU GPA after the first year of college*. The values of *athletic participation in high school, CSU athlete, ethnicity, application fee waiver, and type of conditional admit* did not reveal significant differentiation.

An analysis of the results, using an alpha level of .01, also found three student demographic factors that contained significant differentiation, *sex, athletic participation in high school, and geographic origin location*, when compared to the *hours earned after*

first year of college first year academic success dependent variable. However, at an alpha level of .05, *CSU athlete* also revealed a significant difference when compared to *hours earned after first year of college*. The values of, *ethnicity*, *application fee waiver*, and *type of conditional admit*, *type of high school*, and *earned college credit prior to college*, again, did not reveal significant differentiation.

In regard to the differentiation between the *sex* groups, this indicates that the females had significantly higher GPAs and earned credit hours than the males. And in regard to the *geographic origin location* variable, students in the *other in-state group* had a higher *GPA after the first year of college* and higher number of *earned credit hours after the first year* than students in the *24 county service area* and *out-of-state geographic origin location* groups.

An examination of the results pertaining to differences in student demographic factors of conditionally admitted students in their first to second year retention revealed no significant correlation using an alpha level of .01. However, at an alpha level of .05 the *earned college credit prior to college* did reveal a significant correlation with the first to second year college retention dependent variable.

Research Question Three

The third research question was asked to determine if, based on the student demographic factors that most significantly differentiate when compared to the variables of first year academic success, what academic admission factors of conditionally admitted students best predict first year academic success. The results, using an alpha level of .05, for the *female* group of the *sex* category indicated that the *high school core curriculum GPA* and the *high school GPA* were significant predictors of *earned credit*

hours after the first year of college. The results, using an alpha level of .05, for the *female* group of the *sex* category indicated that the *high school core curriculum GPA* and *ACT English* were significant predictors of *GPA after the first year of college.*

The results, when using an alpha level of .05, for the *male* group of the *sex* category indicated that the *high school GPA* and the *number of math units that met the core* were significant predictors of *earned credit hours after the first year of college.* The results, when using an alpha level of .05, for the *male* group of the *sex* category indicated that the *high school GPA* was a significant predictor of *GPA after the first year of college.*

The results for the *24 county area* group of the *geographic origin location* category indicated that both *high school GPA* and *GPA of completed credit prior to college* were significant predictors of *earned credit hours after the first year of college* and the *GPA after the first year of college.*

The results, using an alpha level of .05, for the *other county in state* group of the *geographic origin location* category indicated that the *high school core curriculum GPA* was a significant predictor of both *earned credit hours after the first year of college* and *GPA after the first year of college.* The results also indicated, using an alpha level of .05, that the *ACT English* was a significant predictor of the *GPA after the first year of college* dependent variable. The results for the *out-of-state* group of the *geographic origin location* and both *yes* and *no* groups of the *athletic participation in high school* categories indicated that none of the variables could be used to create a final model for both *credit hours after the first year of college* and *GPA after the first year of college.*

Research Question Four

The fourth research question was presented to look for differences in first year academic success between students who are and are not retained from the first to second year. The results indicated that both *first year academic success* variables had a significant differentiation when compared to the *first to second year college retention* variable.

In particular, the value of the *CSU GPA after the first year of college* was found to be significantly different between the *first to second year retention* groups. This indicates that the students who were retained had significantly higher GPAs than the students who were not retained. Additionally, the value of the *hours earned after the first year of college* also was found to be significantly different between the *first to second year retention* groups. This indicates that the students who were retained had a significantly higher number of earned credit hours than the students who were not retained.

Discussion

Literature (Brown, 1999; Butler, 1994; Hoover, 2009; Keller & Hoover, 2009; Hoxby, 2009; Kretchmar 2006; Nathan, 1995; Sadler, 2007) suggests concern in using standardized testing for admission decisions. The results specific to this study support this claim. While the composite and four sub scores of the ACT were included in the dataset, only the ACT English sub score resulted as a significant predictor in any of the models. It was a significant predictor of *GPA after the first year of college* for the full sample, the *female* group of the *sex* category, and the *other county in state* group of the *geographic origin location* category.

At CSU, complaints are regularly received from external constituencies about several other factors they advocate as legitimate items to consider when making admission decisions. Many families claim that while their student didn't have high grades and standardized test scores, his/her involvement in high school, especially athletics, has him/her more holistically prepared for college. Also, many families assert the point that their student attended a private high school, which was more academically rigorous, therefore both deflating the academic record of the student yet inflating his/her academic preparedness. However, the results of this study did not indicate that athletic participation in high school or type of high school, public or private, was a significant predictor of academic success or college retention. And while athletic participation in high school did not show indication as a predictor of academic success and college retention, significant differentiation among its groups when compared to the variables of academic success and college retention was observed.

Some concern exists regarding the special admission access granted to college student athletes (Hill, Burch-Ragan, & Yates, 2001). Equity among admission exceptions between student athletes and non-student athletes is one concern. In addition, debate regarding their ability to succeed academically, in addition to athletically, persists. Also, some stakeholders at CSU have emphasized an assumption that a high school student taking college credit while in high school is better prepared academically for college. However, while the findings of this study were in the direction of these assertions, the differences were not statistically significant. Therefore, the results of this study did not indicate that a student's status as a CSU athlete or non-athlete was, nor the number of

college courses taken while in high school as, a significant predictor of academic success or college retention.

Moreover, when reviewing the full sample of conditional admits, the *high school core curriculum GPA* and *number of core curriculum courses taken during the senior year of high school*, in addition to the *ACT English* sub score, were consistent predictors of both academic success variables. This pattern continued even with analyzing the subgroups of the student demographic factors with significant differentiation. The concentrated study on subgroups also revealed *high school GPA* as a significant predictor of academic success for females, males, and students from 24 county service area.

The differentiation within the subgroups also implies specific differences within the groups. In regard to the *sex* student demographic factor, females had a significantly higher *GPA after the first year of college* and *number of earned credit hours after the first year of college* than males. This mandates further questions regarding the sample and/or population, e.g., were the males somehow more marginalized than females?

Additionally, in regard to the *geographic origin location* demographic factor, those students within the state, but not within the 24 county service area, had significantly higher *GPA after the first year of college* and *number of earned credit hours after the first year of college* than students from the other geographic origin location subgroups, i.e., in-state 24 county service area and out-of-state.

Lastly, the study confirmed what most higher education administrators assume to be a fact. That is, students who were retained from the first to second year of college had significantly higher *GPA after the first year of college* and *hours earned after the first year of college* than those students not retained.

Limitations

In this study, a number of limitations that narrowed the scope were present. First, the study only examined one public, four-year university. Consequently, the institutional characteristics were limited to a public, four-year, Midwest university with a represented size confined to one category, the Carnegie Foundation size classification of “large,” which is defined as an enrollment of 10,000 or more full-time equivalent, degree-seeking students (The Carnegie Foundation for the Advancement of Teaching, 2004). Additionally, the sample size only included 249 students over a three year period. A longitudinal study over a more expansive time period would allow for a larger sample size and contribute to a greater ability to generalize the findings (Johnson & Onwuegbuzie, 2004).

Second, in regard to sample size, Research Question Two was used to analyze subsets of the sample, creating even smaller sample sizes. While the sizes met standards according to Field (2009) and Mertler and Vannatta (2005), validity should be considered when analyzing small sample sizes. The analyses suggest patterns, but further statistical analyses, with a larger sample size, should be considered. Thus, the same concern regarding generalization remains (Johnson & Onwuegbuzie, 2004).

Third, Research Questions Two and Four used a bivariate statistical analysis. Therefore, correlations based on a single predictor were revealed. However, logistical regression would provide a covariate analysis, allowing for significance between two or more predictors to be analyzed (Field, 2009).

Fourth, convenience sampling (Creswell, 2003) was employed. Because of this, some limits to the type of variables collected existed. This sampling type also contributed

to the smaller sample size. This characteristic of the study created some challenges for the researcher in verifying that the data collected to use for student demographic, academic admission, first year student success, and college retention factors were consistent with professional literature and studies. This limitation further exposes the debates and conflicting professional definitions of academic success and college retention.

Implications for Practice

The study's findings indicate several implications for practitioners, especially within university admission offices. First, the *high school core curriculum GPA* and *number of credit hours earned during the senior year of high school*, along with some evidence of the *high school GPA* and *ACT English* sub score, were persistent, significant predictors of academic success and college retention. Practitioners may consider more strongly emphasizing variables related to core curriculum courses and high school GPA when making admission policy and practice related decisions. Inherent in this implication is the possible consideration of a decreased focus on standardized test scores and continued moderate approach to other factors, such as type of school, as significant determiners to use when shaping policy and practices.

In regard to the focus on core curriculum, this finding matches the assertions made by Adelman (1999) regarding students of unrepresented populations. His study indicated that low-income students who complete precollege core curriculum achieve the academic credentials needed to obtain regular admission to colleges and universities. Therefore, to help decrease the size of the cohort of conditional admits, institutions of

higher education should work with high schools to help ensure that low-income and high risk students are completing rigorous college preparation programs.

Second, the study raised a question regarding the implications associated with college retention. First to second year retention was one of the three dependent variables identified in the project. However, legitimate questions exist regarding the implication of the study results regarding college retention. For example, the study indicates that students who earn higher GPA and a greater number of credit hours the first year of college are more strongly correlated with first to second year retention. But, what about the students who were not retained? Was it because of academic success factors? Or was it because of other indicators, such as a lack of services provided or social issues? Implications certainly exist, but are beyond the scope of this study.

Third, as a by-product of the statistical analyses, several prediction models were created (C. J. MacGregor, personal communication, April 10, 2010). Models were created for the overall conditional admit sample, and the sub groups of *female* and *male* in the *sex* category, and sub groups of *24 county area* and *other county in state* in the *geographic origin location* category, based on an alpha level of .01, to predict both higher GPA and earned credit hours after the first year of college. Following are the models.

Overall Prediction Model, Earned Credit hours after the First Year of College

*Predicted earned credit hours after the first year of college = (-12.601) + (9.971) * (high school core curriculum GPA) + (.456) * (number of core courses taken during senior year of high school).* This prediction model will be accurate within +/- 4.563 of *earned credit hours after the first year of college* for 68% of the future students. This

prediction model will be accurate within $\pm (2) * (4.563)$ of *earned credit hours after the first year of college* for 95% of the future students based on the two predictors of *high school core curriculum GPA* and *number of core courses taken during senior year of high school*.

Overall Prediction Model, GPA after First Year of College

Predicted GPA after first year of college = $(-1.641) + (.109) * (ACT\ English) + (.767) * (high\ school\ core\ curriculum\ GPA)$. This prediction model will be accurate within $\pm .480$ of *GPA after first year of college* for 68% of the future students. This prediction model will be accurate within $\pm (2) * (.480)$ of *GPA after first year of college* for 95% of the future students based on the two predictors of *ACT English* and *high school core curriculum GPA*.

Prediction Model for Females, Earned Credit Hours after the First Year of College

Predicted earned credit hours after the first year of college = $(20.110) + (9.672) * (high\ school\ core\ curriculum\ GPA) + (-7.693) * (high\ school\ GPA)$. This prediction model will be accurate within ± 5.957 of *earned credit hours after the first year of college* for 68% of the future female students. This prediction model will be accurate within $\pm (2) * (5.957)$ of *earned credit hours after the first year of college* for 95% of the future female students based on the two predictors of *high school core curriculum GPA* and *high school GPA*.

Prediction Model for Females, GPA after First Year of College

Predicted GPA after first year of college = $(-.673) + (.660) * (high\ school\ core\ curriculum\ GPA) + (.071) * (ACT\ English)$. This prediction model will be accurate within $\pm .657$ of *GPA after first year of college* for 68% of the future female students. This

prediction model will be accurate within $\pm (2) * (.657)$ of *GPA after first year of college* for 95% of the future female students based on the two predictors of *high school core curriculum GPA* and *ACT English*.

Prediction Model for Males, Earned Credit Hours after the First Year of College

Predicted earned credit hours after the first year of college = $(7.592) + (6.882) * (\text{high school GPA}) + (2.382) * (\text{number of math units that met the core})$. This prediction model will be accurate within ± 7.830 of *earned credit hours after the first year of college* for 68% of the future male students. This prediction model will be accurate within $\pm (2) * (7.830)$ of *earned credit hours after the first year of college* for 95% of the future male students based on the two predictors of *high school GPA* and *number of math units that met the core*.

Prediction Model for Males, GPA after First Year of College

Predicted GPA after first year of college = $(-.131) + (.809) * (\text{high school GPA})$. This prediction model will be accurate within $\pm .733$ of *GPA after first year of college* for 68% of the future male students. This prediction model will be accurate within $\pm (2) * (.733)$ of *GPA after first year of college* for 95% of the future male students based on the predictor of *high school GPA*.

Prediction Model, 24 County Area, Earned Credit Hours after the First Year of College

Predicted earned credit hours after the first year of college = $(-3.003) + (1.561) * (\text{high school GPA}) + (.253) * (\text{GPA of completed credit prior to college})$. This prediction model will be accurate within ± 8.336 of *earned credit hours after the first year of college* for 68% of the future 24 county area students. This prediction model will be accurate within $\pm (2) * (8.336)$ of *earned credit hours after the first year of college* for

95% of the future 24 county area students based on the two predictors of *high school GPA* and *GPA of completed credit prior to college*.

Prediction Model, Other County, Earned Credit Hours after the First Year of College

Predicted earned credit hours after the first year of college = $(5.434) + (6.611) * (high\ school\ core\ curriculum\ GPA)$. This prediction model will be accurate within +/- 6.401 of *earned credit hours after the first year of college* for 68% of the future 24 county area students. This prediction model will be accurate within +/- $(2) * (6.401)$ of *earned credit hours after the first year of college* for 95% of the future 24 county area students based on the predictor of *high school core curriculum GPA*.

Inherent in any prediction model based on a specific sample, these models will lose effectiveness when using new data instead of the data on which the models were built (Mertler & Vannatta, 2005).

Fourth, several observations of the results of this study, according to its sample, may be helpful to the CSU appeals committee. Regarding sex, males are less likely to succeed than females. According to geographic origin location, those from the 24 county service area (the 24 counties of closest proximity to CSU) are also less likely to succeed. Finally, those students who participated in high school athletics are more likely to earn significantly more credit hours their first year of college than those who did not participate. However, there was not a significant difference within this category regarding the GPA after the first year of college.

Recommendations for Future Research

While this study revealed significant results regarding the research questions in relation to student demographic, academic admission, first year academic success, and

college retention factors, limitations regarding the sample and dataset, type of statistical analyses used, and scope of the project existed. In addition, the study itself produced additional questions. These factors indicate the need for expanded and future research.

Regarding the sample and dataset of the project, several recommendations for future research exist. First, the date of the student's first contact with CSU was another predictor variable that was originally requested by the university associated with the study but then later removed from the plans. The intention was to determine if an earlier contact with the university would somehow give a student a stronger sense of accountability and responsibility, and also the feel of a connection to college while still in high school, potentially leading to the student having a higher capacity to succeed academically. If this variable is included in future studies, the researcher should also consider adding the type of contact, which would allow for the potential of useful recommendations to provide to practitioners at the end of the study.

Also, both the *athletic participation in high school* and *earned college credit in high school* predictors were not significant predictors of academic success and college retention. However, it is worth noting that both were very close to significance according to the alpha level of .05 on the regression model. In both categories, the *yes* groups had a higher mean number of *earned credit hours after the first year of college* than the *no* group. A larger sample size at CSU may have pushed these to a significant level, warranting further study.

Second, another issue often communicated by families of conditional admits is the unfortunate occurrence of a hardship case. The claim provided by the student is that the difficult situation created a period of poor academic performance which inadequately

reflected the student's true potential for academic success. This may be a legitimate claim and warrants further study. However, challenges exist. For example, subjectivity exists within the role of the practitioner and researcher regarding the determination of what constitutes a hardship case. Also, severity of a particular situation and relative impact in each individual situation, along with the development of a valid and reliable measure for comparing, would be difficult to achieve. If attainable, the researcher should also consider categorizing the hardship cases in different themes, e.g., personal illness, sickness or death of family member or friend, divorce of parents, etc., which would also create another challenge to the study.

Third, admission policies are very complex (Keller & Hoover; Kretchmar, 2006). This includes the practices associated with the admittance of conditional admits. While this study considered two types of conditional admits at CSU, those granted an exception by the appeals committee and athletes, other admission alternatives exist. For instance, students who were from the host state and completed the core curriculum requirement section of the full admission policy were allowed to automatically start the summer prior to the fall semester for which they registered. These students were not included in the sample. A future study, including these conditional admits, and those admitted through other alternative admission options, would provide a wider range of results from which to shape policy.

Fourth, two types of statistical analysis were not included within the research methodology of this project. Comparing academic admission factors (interval independent variables) with the college retention factor (category dependent variable) would have required discriminate analysis (Field, 2009). Future study, including this

analysis, would allow for the researcher to determine if the significant predictors of academic success are comparable with those of college retention. Also, research questions two and four were answered with a bivariate analysis and revealed correlations based on single predictors of academic success and college retention. However, logistical regression would allow for a covariate analysis, looking for significance between two or more predictors within the dataset.

Furthermore, resultant to the limited scope of the study, further research that was not applied to this work is recommended regarding the background literature related to the frameworks of this study and ancillary issues related to the subjects of the study. For instance, the study only focused on determining a student's academic success, not his/her ability to succeed socially, psychologically, etc. The frameworks of this study, especially the environment piece of Astin's (1993) Input-Environment-Output Model; Tinto's (1994) Theory of Student Departure, Scholssbert, Waters, and Goodman's (1995) study of Transition Theory; and Bruffee (1999) and Nonaka's (1994) work on reacculturation and organizational learning certainly lend themselves to research beyond the scope of academic success. Also, Lerner (2006) introduced the question of whether or not college courses taken in high school are as rigorous as the same course when taken in college. Further research on this subject would help to better define the validity of the predictor variables related to college courses taken while in high school.

Finally, the results of this study initiated several new questions. First, the results of the second research question indicated a significant difference between males and females in regard to both the GPA and earned credit hours after the first year of college.

Further study regarding the demographic and academic characteristics of these subjects is recommended.

Second, one of the academic admission factors was *number of core curriculum classes taken during senior year of high school*. The intention of this variable, from the perspective of the researcher and practitioner stakeholders, was to validate a perception that students who stay serious in high school by continuing to take core curriculum classes, in contrary to less academically challenging classes, are more likely to succeed academically. However, while the findings give evidence to support this claim, more study is required to fully validate it. The results also spur another question, i.e., do core curriculum courses taken before the senior year of high school also serve as a predictor of academic success and college retention? And, if so, how does that variable compare with the variable related to core curriculum courses taken only during the senior year?

Third, the average GPA after the first year of college and related standard deviation indicated that enough students in the sample were placed on academic probation after their first year of college to warrant further study. Future research on the same or a similar sample, analyzing those who were placed on academic probation, would provide evidence needed for developing additional services and tools for support, along with the need for a stronger focus on the characteristics that best predict academic success.

Fourth, this study did not take into account the reason why students do not have a high GPA or number of earned credit hours, or are not retained, after the first year. While focus on those factors that indicate academic success and college retention are important, and were the primary focus of this study, practitioners are left without a full perspective

when additional study regarding the factors that did not significantly predict academic success and college retention is not applied. Therefore, further research is highly recommended regarding the risk factors of academic success and college retention, both from an input and environment perspective. The input lens would allow for consideration of other indicators and conditions associated with the student at the time of application to the university. The environment lens would allow for an assessment of the current college culture in regard to services and support provided to all students, but especially those identified with known risk factors of academic success and college retention.

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APPENDIX A

IRB Approval Letter

Dear Investigator:

Your human subject research project entitled Predictors of Academic Success for Conditionally Admitted First-Time Freshmen at a Four-Year Public University meets the criteria for EXEMPT APPROVAL and will expire on April 01, 2011. Your approval will be contingent upon your agreement to annually submit the "Annual Exempt Research Certification" form to maintain current IRB approval.

You must submit the Annual Exempt Research Certification form 30 days prior to the expiration date. Failure to timely submit the certification form by the deadline will result in automatic expiration of IRB approval.

Study Changes: If you wish to revise your exempt project, you must complete the Exempt Amendment Form for review.

Please be aware that all human subject research activities must receive prior approval by the IRB prior to initiation, regardless of the review level status. If you have any questions regarding the IRB process, do not hesitate to contact the Campus IRB office at (573) 882-9585.

Campus Institutional Review Board

VITA

The author, Rob Hornberger, was born on February 2, 1972, in St. Louis, Missouri. He was raised in Bridgeton, Missouri and is the second child of Kent, Sr. and Marty Hornberger. After graduating from Pattonville High School in Maryland Heights, Missouri, he attended Missouri State University and received both his Bachelor's of Science degree in Socio Political Communication (1994) and Master's of Science degree in Computer Information Systems (2005). He is married to Kristie Hornberger and they have one child, Sam Hornberger. He currently resides in Springfield, Missouri.

Rob's professional career path has included: inside sales and customer service at Henges Manufacturing, Inc., Maryland Heights, Missouri; admission counselor at Missouri State University, Springfield, Missouri; assistant director of admissions – freshman coordinator at Missouri State University, director of customer service, support, and sales at McMurtrey, Whitaker, and Associates, Inc., Springfield, Missouri; coordinator of web and data support at Missouri State University, and instructor of communication studies at Missouri State University.

He currently serves as the registrar at Missouri State University. He has also been a presenter at several national and state conferences, recently was the president of the Missouri Higher Education Web Developers Association, and is president of his own

company, DropNet Web Services, LLC. Rob continues to seek new endeavors to enhance his capacity for learning and abilities in his professional career.