PREDICTING FIRST-YEAR GRADE POINT AVERAGE AND RETENTION OF STUDENT-ATHLETES USING DEMOGRAPHIC, ACADEMIC, AND ATHLETIC VARIABLES

A DISSERTATION
SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF EDUCATION

BY
JAMES E. JOHNSON

DISSERTATION ADVISOR: DR. ROGER D. WESSEL

BALL STATE UNIVERSITY
MUNCIE, INDIANA
MARCH 2010
ABSTRACT

DISSERTATION PROJECT: Predicting First-Year Grade Point Average and Retention of Student-Athletes Using Demographic, Academic, and Athletic Variables

STUDENT: James E. Johnson

DEGREE: Doctor of Education

COLLEGE: Teacher's College

DATE: May, 2010

PAGES: 190

A sample of 674 first-year student-athletes at Ball State University were examined for five consecutive years (2004-2008) to determine what combination of demographic, academic, and athletic variables best predicted first-year GPA and retention into the second year of college. The dependent variables of first-year GPA and retention were chosen because they are two primary components used to calculate the Academic Progress Rate, a semester by semester evaluation of team academic performance used by the NCAA (Christianson, 2004).

Results revealed college student-athletes had a higher first-year GPA if they were female ($r = .36$), Caucasian ($r = .36$), attended college relatively close to their hometown ($r = .09$), scored well on standardized tests ($r = .49$), had a respectable high school GPA ($r = .65$), were ranked high in their graduating high school class ($r = -.58$), had a large high school graduating class ($r = .15$), declared a major upon entering college ($r = -.11$), were not a member of a revenue sport ($r = .37$), and earned a considerable amount of playing time ($r = .15$). Building on the relative strengths of those relationships, first-year
GPA can be predicted by knowing gender ($B = .16$), race ($B = -.26$), standardized test scores ($B = .03$), high school GPA ($B = .41$), high school rank ($B < -.01$), and high school size ($B < .01$).

The retention of student-athletes into their second year of college produced a slightly different set of relationships. Student-athletes were more likely to be retained if they were Caucasian ($r = .16$), attended college close to their hometown ($r = .09$), scored well on standardized tests ($r = -.11$), had a respectable high school GPA ($r = -.14$), were ranked high in their graduating high school class ($r = .12$), were not a member of a revenue sport ($r = -.09$), and earned a considerable amount of playing time ($r = -.17$). Predicting retention is possible with information about race ($B = 1.09$), distance from hometown ($B = .4$), type of sport ($B = .82$), and amount of playing time ($B = -.70$).
Acknowledgements

Pursuing a doctoral degree has been an exciting endeavor. Although challenging and humbling at times, the process was an overwhelmingly positive experience which has allowed me to grow intellectually, socially, and professionally. During this process there have been many supportive individuals who deserve my sincere gratitude.

First, I would like to thank my family. My wife, Michelle, has been the most significant influence on my progress. She pushed me when I needed challenged, and supported me when I was unsure of myself. Her presence in my life is the greatest thing that ever happened to me, and I would be lost without her. My parents, brother, and other family members also deserve a hearty thank you. They support my efforts, and I am truly grateful for their encouragement. Seeing their pride in my accomplishments is a consistently motivating force in my life. I would be remiss without mentioning my furry little boys, Toby and Darwin. Their greetings always brighten my day.

Second, I would like to thank my dissertation committee. Dr. Roger Wessel has been an outstanding committee chairperson. His expertise, insight, and commitment has been second to none. I look forward to continued work with him in the future. The other members of the committee, Drs. Joe Armstrong, Rob Bell, Tom Harris and Lisa Merriweather-Hunn, have also been exceptionally supportive of my work. I earnestly appreciate the time and effort given by all members of the committee.

Finally, I would like to thank my friends, co-workers, graduate faculty, and fellow graduate students. This group of people inspire me on a daily basis. Whether it is a word of encouragement, a classroom encounter, or a passing smile, I am fortunate to have so many wonderful people in my life. Thank you all.
Table of Contents

Abstract ................................................................................................................................. ii
Acknowledgements ........................................................................................................ iv
Table of Contents ............................................................................................................. v
List of Tables .................................................................................................................... ix

Chapter I: Introduction ........................................................................................................ 1
  Statement of Problem ........................................................................................................ 3
  Statement of Purpose and Research Questions ............................................................. 3
  Research Hypotheses ....................................................................................................... 3
  Setting ............................................................................................................................... 3
  Significance of Study ....................................................................................................... 4
  Assumptions .................................................................................................................... 5
  Definition of Terms .......................................................................................................... 5
  Organization of the Study ............................................................................................... 12

Chapter II: Review of Literature ..................................................................................... 13
  Project Summary ............................................................................................................. 13
  Student-Athletes ............................................................................................................. 13
  Why GPA and Retention? .............................................................................................. 19
    APR Defined .................................................................................................................. 20
    Data Collection and Impact ......................................................................................... 24
  Demographic Variables ................................................................................................. 26
    Gender ........................................................................................................................... 27
    Race ............................................................................................................................... 30
Distance From Home .........................................................................................40
Academic Variables ............................................................................................44
Standardized Test Scores (SAT & ACT) ...............................................................44
High School Measures (GPA, class rank, size) ...................................................56
First-Semester GPA ...............................................................................................62
Major .....................................................................................................................66
Athletic Variables .................................................................................................71
Sport .......................................................................................................................71
Coaching Change ...................................................................................................75
Playing Time ..........................................................................................................78
Team Winning Percentage ....................................................................................83
Summary ...............................................................................................................87
Chapter III: Methods ..............................................................................................88
Project Summary ....................................................................................................88
Design of the Study ...............................................................................................88
   Statement of Purpose and Research Questions .................................................89
   Hypotheses ..........................................................................................................89
   Population and Sample .......................................................................................89
   Research Approach ............................................................................................90
Setting ....................................................................................................................90
Data Collection Procedures .................................................................................91
Statistical Design and Analysis ..........................................................................93
Data Presentation ....................................................................................................94
Appendix A: Playing Time Criteria by Sport ................................................................. 185
Appendix B: Institutional Review Board Approval ...................................................... 187
Appendix C: Letter of Approval From Coordinator of Academic Support Services ...... 189
List of Tables

Table 1. Descriptive Information for Dependent Variables........................................97
Table 2. Descriptive Information for Demographic Predictor Variables.........................99
Table 3. Descriptive Information for Academic Predictor Variables..........................100
Table 4. Descriptive Information for Athletic Variables..............................................102
Table 5. Pearson Correlation Coefficients Between Dependent Variables and
         Demographic Predictor Variables..................................................................103
Table 6. Pearson Correlation Coefficients Between Dependent Variables and
         Academic Predictor Variables .........................................................................105
Table 7. Pearson Correlation Coefficients Between Dependent Variables and
         Athletic Predictor Variables ...........................................................................106
Table 8. Summary of Ordinary Least Squares Multiple Regression for Variables
         Predicting Overall GPA (N = 493)....................................................................107
Table 9. Summary of Ordinary Least Squares Multiple Regression for Variables
         Predicting Overall GPA; First-Semester GPA Excluded (N = 494)................111
Table 10. Summary of Binary Logistic Multiple Regression for Variables Predicting
          Retention Beyond First Year (N = 514).........................................................114
Table 11. Summary of Binary Logistic Multiple Regression for Variables Predicting
         Retention Beyond First Year; First-Semester GPA Excluded (N = 517).............116
CHAPTER I
INTRODUCTION

In 1990 Murray Sperber wrote, “Intercollegiate athletics has become College Sports Inc., a huge commercial entertainment conglomerate with operating methods and objectives totally separate from, and mainly opposed to, the educational aims of the schools that house its franchises” (p. xi). In the years since Sperber’s work, the National Collegiate Athletic Association (NCAA) has implemented several academic reform measures to reaffirm the academic commitment of its member institutions. Such measures have been designed to retain the academic integrity of college athletics while combating the commercialization seen in recent decades. The latest academic reform package enacted by the NCAA in 2005, and by far the most substantial, included the Academic Progress Rate (APR).

Unlike previous academic measures (e.g., graduation rates), which often relied on outdated information, the APR was designed as a real-time indication of a team’s academic performance (National Collegiate Athletic Association [NCAA], 2004). Each team earns a score that is calculated by both academic eligibility and retention of individual students on a semester by semester basis. This score must meet a minimum cutoff established by the NCAA to avoid penalties which could include loss of scholarships or post-season play (Brown, 2005). The APR was created to better understand the academic culture in individual sports, and individual teams within those
sports. Keeping athletes academically eligible and moving towards graduation is the primary academic goal of the NCAA. However, before the APR there were only indirect ways to track such information or to clearly identify which sports may display a culture contesting the academic goals of the NCAA (Christianson, 2004; NCAA n.d.b).

Because the NCAA has identified both individual academic performance (i.e., eligibility based partly on grade point average [GPA]) and retention as the criteria to calculate the APR, it is logical for anyone interested in the academic success of student-athletes to wonder what variables might best predict these criteria. Predicting the academic success of college student-athletes is not a new idea. There is a plethora of research examining predictors of student-athlete academic performance, especially as it pertains to traditional predictors of academic success such as gender, race, test scores, and high school GPA (see Chapter 2).

Although the traditional demographic and academic variables have been widely examined in the student-athlete literature, the results have been varied. Reexamining many of these variables is reason enough to validate the current research. However, there is another category of predictor variables unique to student-athletes that may shed light on academic performance and retention. Those variables are athletic in nature and include type of sport, a coaching change, playing time, and team winning percentage.

Despite the lack of empirical evidence linking academic performance and retention to such athletic variables, it is reasonable to assume such variables may impact the academic performance of student-athletes. It is also reasonable to assume that because of the powerful athletic identity associated with elite athletes (Taylor & Taylor, 1997), athletic participation has a significant impact on all aspects of a student-athlete’s life. If
combined with the traditional demographic and academic predictors, these athletically related variables may provide information critical to better predict GPA and retention.

Statement of Problem

The problem this study attempted to address was the lack of predictive evidence associated with the two primary determinates of the APR. More specifically, understanding the predictive influence of demographic, academic, and athletic variables as they related to first-year GPA and retention provided a better ability to predict two specific components of the APR (i.e., GPA and retention).

Statement of Purpose and Research Questions

The purpose of this study was to predict student-athletes’ first-year college GPA and persistence into their second year of college using demographic, academic, and athletic variables. This goal was achieved by answering the following two research questions. First, what variables predict GPA for student-athletes during the first year of college? Second, what variables predict retention of student-athletes beyond the first year of college?

Research Hypotheses

The following hypotheses were tested in this study:

1. All variables examined are significant predictors of first-year college GPA.
2. All variables examined are significant predictors of retention beyond the first year of college.

Setting

The current study took place at Ball State University. The campus, located in Muncie, Indiana, is a state-assisted residential university one hour northeast of
Indianapolis. Ball State is ranked as a doctoral/research university by the Carnegie Foundation and has approximately 20,000 undergraduate and graduate students (Ball State, 2009b). There are 175 bachelor’s, 92 master’s, 16 doctoral, eight associate, and two specialist degrees offered through seven academic colleges (Ball State, 2009a). Ball State is a member of the NCAA and competes in seven men’s and twelve women’s sports at the Division I level (Ball State, 2009c).

The researcher, who is the Assistant Coordinator of Academic Support for Student-Athletes, has witnessed the effects athletic participation appears to have on the academic progress of student-athletes, as well as the impact the APR has on identifying academic programming efforts for student-athletes. Identifying athletic variables, in conjunction with demographic and academic variables, allowed the researcher to identify the best set of variables from which to predict GPA and retention. This potential link between student-athletes’ athletic and academic pursuits is critical to understanding the overall academic performance of student-athletes.

Significance of Study

The significance of this study is twofold. First, this is the only study to date that utilized this particular set of athletic variables, in combination with demographic and academic variables, to predict college GPA and retention. Many studies have examined various academic and demographic predictors for college students, but this particular combination of predictive variables, and their potential relationship to the APR, is relevant for all those involved in the education of college student-athletes. Second, this study examined student-athletes at Ball State University, and the specific variables used to evaluate students by the staff of Academic Support Services.
Assumptions

The following assumptions applied to this study.

1. The participants are representative of all freshman student-athletes at Ball State University.

2. The data obtained from the IBM Hummingbird system, Ball State Academic Support Services, and Ball State Athletics Media Relations were accurate and applicable to this study.

Definition of Terms

APR -

The APR is the fulcrum upon which the entire academic-reform structure rests. Developed as a more real-time assessment of teams' academic performance than the six-year graduation-rate calculation provides, the APR awards two points each term to student-athletes who meet academic-eligibility standards and who remain with the institution. A team's APR is the total points earned by the team at a given time divided by the total points possible. (NCAA, n.d.a, ¶ 1)

Coaching Change - For the purposes of this study, the term coaching change referred to any change in the head varsity athletic coach during the summer prior to a student-athletes’ fall enrollment (beginning the first day of summer school), or anytime during the first year of a student-athlete’s college education (ending the final day of classes in the spring semester). Because coaches are potentially the most influential figure in the lives of college student-athletes (Parsh, 2007), and because they recruit and oversee all athletic and academic progress of student-athletes (Baldwin, 1999, Looney,
1989), their impact on student-athlete behavior is potentially dramatic. A change in this leadership during the summer or school year could account for different attitudes and behaviors by individual student-athletes, thus impacting GPA or retention.

**Distance From Home** - Because college students often experience homesickness (Fisher, 1989), it is logical to conclude distance from home may impact those feelings. Furthermore, because athletic time commitments do not allow student-athletes to travel home when they desire, homesickness may be more intense for these students. Therefore, for the purposes of this study, distance from home was divided into three categories based on the number of miles between a student-athlete’s hometown and Ball State University. Each student’s home address was inputted into the driving directions of mapquest.com as the end location. Ball State University was the starting location (2000 W. University Avenue). Short distance was defined as 100 or less miles. Medium distance was defined as 101-250 miles. Long distance was defined as more than 250 miles.

Because there are no established standards to distinguish what distances should be used in the context of this research, these distances were chosen because they represented varying levels of opportunity for student-athletes to stay connected with their hometowns. The farther the student moves from home, the less likely they are to travel home, or have their friends and family travel to see them. As the distance increases, so does the inability to travel. Student-athletes who were recruited from great distances may only have the opportunity to return home a few times a year due to athletic schedules, travel time, or expenses.
Eligibility - Student-athletes who meet the minimum academic standards established by the NCAA are deemed academically eligible. Eligibility can also refer to minimum athletic standards, but for the purposes of this study only academic eligibility following the first full academic year was considered (two semesters and summer school). Therefore, being eligible was defined as earning a minimum of 24 credit hours and a 1.8 GPA by the first day of classes in the second academic year.

First-Semester College GPA - Because Ball State University is divided into fall and spring semesters, the end of the fall semester is considered the half-way mark of a student’s first year of college. This point offers information from which to predict future academic performance. Therefore, first-semester GPA was defined as the GPA calculated after students’ first full semester attended at Ball State University.

High School GPA - Although high school GPA has been shown as a valuable predictor of college success (Espenshade, Hale, & Chung, 2005; Melendez, 2006), this study will not utilize the true GPA for all classes students attended in high school. Instead, Ball State University uses only core courses from a student’s high school grades to establish an AC Index. The core courses used to calculate the AC Index are math (e.g., algebra, geometry, calculus, etc.), science (e.g., biology, chemistry, Earth science, etc.), social studies (e.g., history, psychology, sociology, etc.), English, and foreign language. This index is a more accurate predictor of high school achievement because it measures the essential courses used by college admission departments that most likely apply to college performance, and eliminates many of the unique courses (e.g., technology education, physical education, art, etc.) that may inflate a student’s high school GPA. However, it is important to note in most situations, true high school GPA and AC Index
produce similar numbers. Therefore, for the purposes of this study, AC Index was used in place of high school GPA, but for language consistency, the term high school GPA was used throughout the study.

*High School Rank* - The variable known as high school rank refers to a number assigned to students based on specific criteria (often GPA) that compares students of the same graduating class against each other (Murphy, 1971). Within the admissions process, Ball State University collects this information and keeps it on record. Therefore, for the purposes of this study, high school rank referred to the number assigned to students resulting in a ranking relative to others in their high school class. Because this study also included the size of the high school, using exact numbers was possible. For example if a student was ranked 85 out of 183 in their high school class, they were ranked in the top 46% in their graduating high school class.

*High School Size* - Much like the size of a college freshman class, the size of one’s high school graduating class may offer different opportunities and levels of interaction. For example, larger graduating classes might provide a greater level of diversity which might better prepare student-athletes for the collegiate social atmosphere, whereas smaller graduating classes might limit such experiences (Ashbaugh & Thompson, 1993; Geffert & Christensen, 1998; McDaniel & Graham, 1999). For the purposes of this study, and because there is no established criteria to determine the most appropriate size classifications, size of a student-athletes’ graduating class was divided into three categories. Small graduating classes were defined as having less than 150 students. Medium graduation classes were defined as having 150 to 300 students. Large graduating classes had more than 300 students.
**Major** - For the purposes of this study, students were classified as having a major or being undecided. Individual majors were not addressed in this study. To determine if students have a major, the IBM Hummingbird database system at Ball State University was utilized. This information was gathered based on the information given when new students registered for their fall classes during their summer orientation process. Therefore, the decision to have a major, or be undecided, upon entering college is the focus of this variable.

**Playing Time** - Because many student-athletes associate their identity with their athletic participation (Melendez, 2006; Taylor & Taylor, 1997), and because most college athletes received ample playing time in high school, it can be assumed some student-athletes may be impacted by a lack of playing time. Determining how to define playing time for each sport was challenging because there were no established criteria in the previous literature to determine how best to define what levels of playing time may impact a student-athlete’s identity or academic pursuits. This decision is further complicated because each sport offers a unique context for which to evaluate a student-athlete’s acceptable level of playing time on a particular team. Additionally, different sports record different playing statistics. Basketball, for example, keeps accurate records of minutes played, which is a specific measure of playing time. Most other sports, however, only record games started and games played, without any record of minutes played.

Based on these challenges, the researcher chose to use the number of contests to measure playing time (i.e., game, round, meet, match). The only exception to using this criterion is basketball, which utilized minutes played instead of contests. To establish the
level of playing time, the first step was to determine the maximum contests available in each sport (for each season). Second, the number of contests was then divided by 3 to determine 3 tiers of potential participation for each sport (low, medium, high). Third, the amount of contests participated in by each student-athlete was determined. Fourth, student-athletes are assigned to one of the three participation tiers representing their level of playing time. For a complete list of the criteria used to determine playing time, see Appendix A.

Retention - It is estimated 40% of college students will leave higher education without obtaining a degree, and 75% of those students may leave within the first two years of entering college (Tinto, 1993). These numbers indicated a need to establish retention patterns early in a student's career. Although there are multiple ways to define student retention most refer to a sustained commitment, or some type of formal measure of enrollment. For the purposes of this study, a student-athlete was considered retained if they are enrolled at Ball State University after the final day to add/drop classes in the fall of their second academic year (i.e., end of the first week of classes). This information was gathered using the Ball State University IBM Hummingbird database system.

Standardized Tests - College admission decisions routinely involve the use of standardized testing. The Scholastic Aptitude Test (SAT) and the American College Testing (ACT) test are the two most common tests used in this capacity. Both tests were utilized in this study. To aid in the consistency of statistical evaluations, SAT scores were converted to ACT scores using a concordance table provided by American College Testing services (American College Testing, 2009a). Therefore, standardized test scores are defined as SAT and ACT scores converted into ACT score format.
Student-Athlete - A student-athlete is any new student identified by each varsity coach as a first-year member of their team during a pre-semester meeting with Academic Support Services. These meetings, usually held the week before fall classes begin, allows the coach to provide all names of scholarship and walk-on student-athletes they are allowing on their team for the start of the academic year. This list is a more accurate representation of new students than a compliance roster because several student-athletes often discontinue participation in their respective sports during the first few weeks of the fall semester, before an official compliance roster may be created.

Sport - The sample of student-athletes in this study came from the seven men’s and 12 women’s varsity athletic teams at Ball State University. Because there are not enough participants to investigate each individual sport, the term sport referred to revenue versus non-revenue sports. Revenue sports were football, men's basketball, and women's basketball. All other sports were considered non-revenue sports.

Winning Percentage - Although there appears to be mixed evidence to conclude a team’s athletic success might influence academic outcomes (Amato, Gandar, Tucker, & Zuber, 1996; Christianson, 2004; Hosick, 2009; Institute for Diversity and Ethics in Sport, 2008; NCAA Research Staff, 2008; Shapiro, 1984), it is worthwhile to examine such a link. For the purposes of this study, winning percentage was defined as the number of wins divided by the number of total games for a sport season (any ties were eliminated from the calculation). This definition applied to all sports except, men’s and women’s golf, and women’s track. Results for these sports are often recorded as a place finish based on number of teams competing (e.g., third place out of eight teams). For these sports, winning percentage was defined as the mean percentile ranking of all multi-team
competitions. For example if a golf team placed 4th out of 15 teams they would be in the top 26% of the teams in a given tournament. This would equate to a .74 winning percentage. If the same golf team finished in the top 26% (.74), top 30% (.70), top 50% (.50) and top 60% (.40) of four tournaments, their winning percentage would be calculated by using the mean of these finishes (.59% in this case). This number would equate to the percentage of wins by sports where there is a clear winner in a head-to-head competition.

Organization of the Study

This study is organized into five chapters. This chapter, an introduction, has introduced the major concepts of the study. The second chapter is a review of the relevant literature on student-athletes, as well as literature on the predictor variables in question. Chapter three outlines the methodology. The results are the subject of chapter four. Chapter five includes a discussion of the results. References and appendices follow chapter five and conclude the study.
CHAPTER II
REVIEW OF LITERATURE

Project Summary

The current research attempted to predict first-year grade point average (GPA) and retention using demographic, academic, and athletic variables. GPA and retention were chosen as dependent variables because they are the primary components used to calculate the Academic Progress Rate (APR), a measurement used by the National Collegiate Athletic Association (NCAA) to evaluate real-time academic performance of individual teams. Gaining an understanding of how these predictor variables impact APR scores may help provide effective academic support programming for student-athletes.

This research is presented in a five-chapter format. Chapter two is the review of literature.

This review of literature first offers a perspective on the lives of student-athletes, and the context of college athletics as a member of the NCAA. Additionally, the APR is described in detail as it was the catalyst for the current research. Secondly, the review focuses on the literature pertaining to the demographic, academic, and athletic predictors of student-athlete academic performance examined within this study.

Student-Athletes

Before a link can be established between student-athlete academic performance and the predictor variables in question, it is necessary to contextualize the experience of
collegiate athletes. Understanding the unique challenges faced by college student-athletes provides perspective into the potential predictive value of the demographic, academic, and athletic predictors.

The amount of time and energy given by student-athletes can be staggering. They must meet the same academic demands as other students with only minimal accommodations while devoting extensive time (30 to 40 or more hours a week) and energy to their sport, spending time away from classes for athletic competitions, satisfying demanding coaches whose livelihood depends upon their athletic performance, and maintain self esteem by performing up to their own, coaches’ and family and friends’ expectations.

(Simons, Bosworth, Fujita, & Jensen, 2007, p. 251)

Time is potentially the biggest obstacle between a student-athlete and academic success. The 30 to 40 hours referenced by Simons et al. can include two to four hours of practice per day, travel, competition, film review, weight training, injury rehabilitation, media responsibilities, and community service. Much of these activities take more time than may be assumed, and are in addition to the academic demands faced by all college students (Emma, 2008). Such time restrictions may also cause financial stress because student-athletes are unlikely to pursue a job while participating in college athletics (Cogan & Petrie, 1996; Melendez, 2006).

Part of the aforementioned time commitments include physically demanding activities. Practices can often be grueling bouts of running, violent contact, and intense concentration. Injury rehabilitation can take hours of therapy, and may be as exhausting as practice. Weight training often pushes athletes to muscle failure, which requires an
athlete’s body to be in a constant state of restoration. These daily physical demands usually occur in the middle of the afternoon, and can take a toll on a student-athlete’s ability to concentrate during the evening hours, a time usually reserved for studying (Emma, 2008).

In addition to the time and energy given by student-athletes, it is helpful to recognize the emotional strain associated with athletic identity. The term athletic identity has been used to describe the extent to which a student identifies with the role of an athlete (Taylor & Ogilvie, 2001). In most cases, college student-athletes have participated in their sport for the majority of their lives. They can derive a personal connection to their sport, and they may evaluate part of their self-worth in terms of their athletic performance. Athletic identity can serve to create a variety of emotional stressors that can hinder academic progress (Brewer, Van Raalte, & Linder, 1993; Marx, Huffman, & Doyle, 2008; Melendez, 2006; Taylor & Taylor, 1997).

For example, an individual with a strong athletic identity may identify a failing grade relative to their athletic lives (e.g., being ineligible). Conversely a student with a weak athletic identity might see the same event from a more academic perspective (e.g., impacting chance of being accepted into graduate school; Brewer et al., 1993). It is reasonable to assume such a difference in perspective could play a role in the grade point average and retention of student-athletes. In other words, student-athletes with a high athletic identity may approach academic responsibilities with less vigor than those who do not identify themselves primarily as an athlete (Lucas & Lovagna, 2002; Reiter, Liput, & Nirmal, 2007).
Oftentimes college student-athletes were celebrities at their respective high schools. They may carry the expectations of parents, friends, and coaches with them as they compete at the collegiate level. This pressure may enhance athletic identity and can prove stressful, particularly in the revenue sports of football and basketball (Emma, 2008; Simons et al., 2007). If student-athletes are not successful in their college sport, they may become ineligible, or be removed from a team. Such an outcome may leave a student-athlete feeling “isolated and unsupported” (Melendez, 2006, p. 52).

Psychological and developmental issues may also accompany a highly developed athletic identity. Pinkerton, Hinz, and Barrow (1989) explained student-athletes are subjected to the same developmental and psychological stages as non-athletes. “These developmental steps apply to the student-athlete as well as to the university student in general, although under amplified and potentially more stress producing circumstances” (p. 218). Subsequently, student-athletes have a variety of unique issues for which mental health counselors or sport psychologists may intervene. Such issues might include denial of emotional problems due to a heightened sense of a hero persona, counterdependence due to the stereotypes of the “macho male” and the “All-American woman,” lack of social support beyond teammates, fear of success, identity conflict, poor athletic performance, academic issues due to unconventional schedules, and career and vocational issues.

There is little doubt a strong athletic identity can impact a student-athlete’s college experience. However, it should be noted that not all college athletes have a high athletic identity. Many have identities that conform to the requirements of higher education, and thus prioritize academics above athletics. In fact, many of the dumb jock
stereotypes associated with student-athletes have been debunked (Jones, 1998; Shapiro, 1984). Obviously, the variables which impact student-athlete performance are too numerous to discuss comprehensively. However, there appear to be some variables more salient than others. Differences in sport, gender, geography, level of competition, race, etc. may dramatically influence how much of an athletic identity is manifested, and ultimately how student-athletes perform academically.

External to a student-athlete’s individual experience are the popular critiques of college athletics. These critiques provide another source of potential stress for student-athletes, and demonstrate the ongoing struggle for academic credibility faced by athletic departments. At the forefront of these critiques is the opinion that athletic priorities often supersede academic responsibilities for financial gain (Staurowsky & Ridpath, 2005).

As early as the 1800s, there has been criticism of college athletics undermining academic ideals. Concerns from faculty, students, coaches, administrators, media, and politicians have been a mainstay since the inception of college athletics (Staurowsky & Ridpath, 2005). In a 1929 Carnegie Foundation Report entitled “American College Athletics” it was concluded that:

More than any other force [athletics has] tended to distort the values of college life and increase its emphasis on the material and monetary.

Indeed, at no point in the education process has commercialism of college athletic wrought more mischief than in its effect upon the American undergraduate. And the distressing fact is that the college, the fostering mother, has permitted and even encouraged it to do these things in the name of education. (Savage, 1929, p. 307-308)
Contemporary critiques express similar ideas. The Knight Commission, a group “working to ensure that intercollegiate athletic programs operate within the educational mission of their colleges and universities” (Knight Commission, 2009, ¶1), stated “the most glaring elements of the problems – academic transgressions, a financial arms race, and commercialization – are all evidence of the widening chasm between higher education’s ideals and big time college sports” (Knight Commission, 2001, p. 1). The result of such a widening chasm has created a negative opinion from many critics outside athletic departments.

The concerns expressed by the Knight Commission are held by many faculty and administrators in higher education. As budgets for academic programs show little growth, or remain stagnant, budgets for athletic departments have grown steadily (Knight Commission, 2009). Such policy decisions, combined with dumb jock stereotypes, may lead some faculty to resent student-athletes or see them as “academically unqualified illegitimate students whose only interest is athletics” (Simons et al., 2007, p. 251).

Although it is unfair to generalize all faculty and administrators as critical, as it is unfair to generalize all student-athletes as dumb jocks, there is a perception by student-athletes that should be noted. Simons et al. (2007) examined 538 collegiate athletes at a large Division I-A public university to determine their opinion on how they were perceived by faculty and students. Results indicated that 33% of student-athletes believed they were perceived negatively by faculty, and 59.1% believed they were perceived negatively by other students. Furthermore, 61.5% reported they were refused or given a hard time by professors when asking for athletic accommodations and 62.1% reported a faculty member had made a negative remark about student-athletes in their class. These
results demonstrate a belief from student-athletes that faculty and students may hold a negative opinion of them because of their role as a student-athlete.

Further complicating the world of college athletics is the critique that student-athletes are exploited for the sake of money (Sperber, 2001). Commercialism, especially in the high profile sports of football and basketball, can generate a tremendous amount of revenue and publicity. Talented athletes are needed to make these programs successful. It is this need of athletic success that can put undue pressure on athletic departments, faculty, administrators, coaches, and student-athletes to sacrifice educational missions in favor of producing a winning athletic team. As this pressure is exerted on athletic departments, one is left to wonder if “the educational interests of athletes are sacrificed to serve the economic interests of their individual institutions, the NCAA, athletic conferences and their corporate partners” (Simons et al., 2005, p. 2).

This brief glimpse into the world of college athletics is not meant to be comprehensive. Instead, it is meant to contextualize this unique group of students and their environment. This glimpse is also meant to demonstrate the additional factors influencing the behavior and perceptions of student-athletes, both within athletic departments and outside this complex world. As this review of literature progresses, these descriptions serve as a point of reference to explain how particular variables may impact student-athletes, and why such variables may be important to investigate within the student-athlete population.

Why GPA and Retention?

Because of the unique context of college athletics, and the aforementioned issues impacting student-athletes, the NCAA has been active to provide legislation ensuring
academic integrity. The cornerstone of this study involves a piece of the most recent academic legislation known as the APR. By adopting the APR, the NCAA expressed its commitment to reaffirm the emphasis on “student” in the student-athlete equation. “The ability of the NCAA to measure academic performance will in and of itself be sufficient incentive for athletics programs to ensure that the mission of educating student-athletes is not compromised, circumvented or ignored” (National Collegiate Athletic Association [NCAA], n.d.c, p. 1).

APR Defined

Brown (2005) noted the rationale behind the APR came from the lack of real-time academic data for individual athletic teams. The previous academic markers used by the NCAA were initial eligibility markers, which are determined before students enter college, and graduation rates, which are calculated six years after students are admitted to college. While enrolled at an institution, the NCAA also monitored grade point average (GPA) and percentage of degree completion to establish ongoing eligibility for individual student-athletes.

Unlike the aforementioned eligibility markers, which focused primarily on individual eligibility or delayed graduation rates, the APR provides a semester-by-semester look at the academic culture for each athletic team. The APR also offers a national comparison for different sports, conferences, and institutions based on team APR scores. An additional rationale for establishing the APR was to hold individual coaches and athletic departments accountable for recruiting capable student-athletes, and monitoring the academic progress of their athletic teams (Christianson, 2004; NCAA, n.d.b).
The APR is calculated for all “currently enrolled student-athletes receiving institutional financial aid based in any degree on athletics ability” (NCAA, 2004, p. 1). Included in this cohort are teams that do not offer financial aid, but recruited student-athletes who are on the team roster, or who have exhausted athletic eligibility and returned to an institution to complete a degree. Walk-on student-athletes in sports that offer athletic scholarship money are not included in this cohort, and subsequently are not calculated in the APR numbers. To establish the correct cohort, institutions may use many departments on campus including compliance, registration, university planning, academic support, coaches, financial aid, and athletic administration (Crenshaw & Leger, 2007).

After the team cohort has been identified, the APR is calculated using both eligibility and retention points. During a semester a student can earn two points. One point is earned for being academically eligible, and one is earned for returning to school the following semester (i.e., retention). Therefore, during an academic year, a student-athlete can earn four APR points if they are eligible and return to pursue their education (Brown, 2005).

An eligibility point is earned when an individual is certified eligible through an institution’s compliance department by meeting the GPA, credit hour, and progress towards degree minimum standards. The GPA requirement is a 1.8 after the first year, a 1.9 after the second year, and a 2.0 in each subsequent year. Credit hour requirements include a minimum of 6 hours completed in any given semester and 18 hours between two semesters. Progress towards degree requirements mandate after the second year of athletic eligibility students must have earned 40% of their degree, 60% after the third
year, 80% after the fourth year, and 100% after year five (Brennan, 2006; Hamilton, 2005). These eligibility guidelines are the minimum standards set forth by the NCAA. It is important to note that although many institutions adhere to the NCAA minimum guidelines, individual athletic conferences or institutions may require student-athletes to meet eligibility guidelines above these minimum standards. For example, an institution may require all student-athletes to maintain a 2.0 GPA during their entire undergraduate experience, rather than earn a 1.8 and 1.9 in the first and second years, respectively. Such an institutional rule could prevent an eligibility point for a student-athlete that would have otherwise been earned under the NCAA minimum GPAs at a similar institution (Brennan, 2006).

A retention point is earned when a student-athlete “is retained by the institution, returning to school as a full-time student the next regular academic term” (NCAA, 2004, p. 2). If a student graduates, they are given both an eligibility and retention point. Retention and eligibility were chosen because they are the two factors that best indicate graduation, which is the goal deemed most important by the NCAA (Brown, 2005).

The team APR is then calculated by dividing the total team points earned by the total team points possible. Because the result is a decimal number, the Committee on Academic Performance (CAP) decided to multiply the decimal by 1,000 to make the corresponding score more easily understood. Thus, a perfect team APR score is 1,000. The designated cutoff score for penalties is 925. A 925 cutoff point was chosen by the CAP because it equates to approximately a 60% graduation rate (NCAA, n.d.a). However, the president of the CAP, Walter Harrison, hesitated to explain the 925 cutoff this way because graduation rates are an entirely different measure than the APR. He
noted the 925 mark will be better understood in the future, but for now the CAP had to
equate the number with something, and graduation rates seemed to make the most sense.
Harrison explained, “the APR is better because it is a term-by-term, year-by-year
calculation that provides a much more sensitive measurement of student-athlete academic
performance” (Brown, 2005, ¶ 14).

Another reason for the 925 cutoff was to provide teams with enough of a cushion
so that normal attrition rates could be factored into the equation. Diane Dickman,
managing director of membership services for the NCAA, explained the 925 mark this
way;

    We know that most teams over a four-year period are going to lose points.
    Things happen in people’s lives – they meet the love of their lives or a
    parent has a health issue – and they transfer. That’s why we didn’t set the
    bar at perfection. But if you’re having sustained, regular ‘runoffs’ to the
    point that half of your roster is just leaving year after year, something’s
    wrong. (Hamilton, 2005, p. 4)

    Any team falling below the 925 mark is subject to both contemporaneous
penalties and historical penalties. Contemporaneous penalties are the most immediate
penalties and occur when a team below 925 has a student-athlete go 0/2 (ineligible and
leaves school). Such a penalty means that institutions cannot re-award the scholarship to
another student-athlete. Thus, a 0/2 means that a scholarship is lost for a full year. This
type of penalty is designed to identify immediate problems and reinforce the importance
of retaining student-athletes, while moving them towards graduation (Brennan, 2006).
Historical penalties, which began after four years of data were collected in 2008, triggered a much more punitive result for teams. Crenshaw and Leger (2007) noted these penalties were designed to punish the chronic underperformers. The punishments include loss of scholarships, postseason bans, and potential loss of NCAA membership. To qualify for historical penalties teams must have a four-year rolling average score below 900.

Because 2008 was the first year historical penalties went into effect, it is difficult to establish a long-term analysis of such penalties. For the first four years, teams were subject to only contemporaneous penalties, which gave them an early warning to fix their academic problems. However, beginning in 2008, the NCAA had data each year from which to calculate a four-year average and monitor individual team culture (NCAA, n.d.d; Sander, 2008).

Data Collection and Impact

APR data was first collected for the 2003-2004 academic year. The first data set was provided to institutions in February of 2005, but the information was for informational purposes only. There were no contemporaneous penalties associated with the first data set because the CAP decided they needed two years of data before a negative pattern could be established, and punitive action could be taken (Wieberg, 2005a). Former NCAA president, Dr. Myles Brand, indicated the first data set was meant to be an early warning to institutions so they could begin to assess potential plans for improvement (Christianson, 2005).

The first year also produced results that were predicted by the CAP. Football (923), men’s basketball (923) and baseball (922) were the only sports to have a national
average under the 925 cutoff (USA Today, 2005). Women’s field hockey, lacrosse, and rowing earned the highest average scores (981 for each). Of the 326 schools in Division I-A, 183 (56%) had at least one program below the 925 mark (Wieberg, 2005a, 2005b).

The second and third years of data (2004-05 and 2005-06) had similar results. The same three men’s sports registered the lowest average APR scores, while numerous women’s sports showed strong scores. However, beginning with the second year of data, contemporaneous penalties were enforced. In year two there were 111 out of 6,100 teams penalized, while year three showed almost identical numbers with 112 teams penalized. These numbers indicate less than 2% of all NCAA Division I-A teams were subject to contemporaneous penalties (NCAA, 2006). The results for the second and third year were encouraging to NCAA officials, especially because the fourth year of data would trigger the hard-hitting historical penalties (Stewart, 2007).

The most anticipated data arrived in May 2008. This data triggered the use of a four-year rolling average, rather than a single year of data from which to base the harshest penalties. Single year APR scores were still used to determine contemporaneous penalties, but any loss of post-season play was to be determined by the historical penalty structure (Stewart, 2007).

The results from the fourth year of data revealed similar patterns to the prior years, but were less harsh than many critics had predicted. Similar to years two and three, the four-year average saw approximately 3% of all Division I-A teams fall below the 925 mark. Only 218 teams out of approximately 6,100 were penalized. Of those, 174 lost scholarships for the 2008-2009 academic year, while 44 received public warnings. Dr. Brand saw those numbers as encouraging. He explained the relatively positive outcome
as the result of the gradual introduction of the APR over the previous four years, as well as institutions’ commitment to embrace the philosophy of the APR, and make behavioral changes within their athletic departments (Sander, 2008).

Results from the most recent data set released in May of 2009 revealed similar, but improving patterns. The sports of men’s basketball, football, and baseball still displayed the lowest APR scores. However, general trends in APR scores revealed this legislation has produced positive results. According to Dr. Brand; “After five years of APR application and data collection, there is clear evidence of upward trends in nearly every sport” (NCAA News Release, 2009, ¶ 3).

The APR has impacted college athletics. Using eligibility and retention as the criteria to calculate the APR allows one to conclude these variables are critical to understanding the academic progress of student-athletes. Therefore, the current study used demographic, academic, and athletic variables to predict two primary components used to determine the APR; GPA and retention. Understanding how GPA and retention are related to demographic, academic, and athletic predictor variables will assist administrators in evaluating and intervening in the academic endeavors of student-athletes, and potentially improving APR scores and overall academic performance.

Demographic Variables

To determine the most accurate predictors of GPA and retention, this research utilized independent variables categorized as demographic, academic, and athletic. Demographic information refers to population characteristics. This type of information is routinely used in research with human participants because it provides a natural and logical way to group similar individuals together while clearly distinguishing between
groups. Standard demographic variables may include gender, race, age, or comparable characteristics (Fraenkel & Wallen, 2006). This research evaluated the demographic variables of gender, race, and distance from home, as potential predictor variables for GPA and retention. The following discussion of demographic variables is focused specifically on the variables' relationship to student-athletes’ academic performance.

Gender

When comparing the academic performance of student-athletes by gender, the evidence is clear. In virtually every piece of literature where gender has been used to compare academic performance of student-athletes, females perform at a higher level than males (Betz & Fitzgerald, 1987; Kane, Leo, & Holleran, 2008; Mayo, 1982; Purdy, Eitzen & Hufnagel, 1982; Rosser, 1989). This notion is especially true when using the most common NCAA academic evaluation measures. The APR, Graduation Success Rate (GSR), and Federal Graduation Rate (FGR) all report women student-athletes outperform males (Hosick, 2009; NCAA Research Staff, 2008).

Among Division I student-athletes in the most recently released GSR data (students who entered college in 2001), females graduated at a 72% rate while males were at 57%. All female students graduated at a 65% rate while all male students graduated at 59% (NCAA, 2009). In a study comparing the GSR of the men’s and women’s NCAA basketball Sweet 16 teams in 2009, the Institute of Diversity and Ethics in Sport found that 100% of the women’s teams graduated at least 60% of their athletes. Only 56% of the men’s Sweet 16 teams graduated their student-athletes at a rate of 60% or better (2009).
GPA has been consistently found to be higher for female student-athletes as well. Whether it is high school (Jefferson, 1999), community college (Kanter & Lewis, 1991), small college (Jones, 1998), or large institutions (Babington, 1997; Durand, 1999; Foltz, 1992; Mayo, 1982), average GPA is higher for female student-athletes. When one combines such information with evidence that high school rank, standardized test scores, and academic motivation are higher in female student-athletes, it is no wonder that gender is considered a primary predictor variable for nearly any academic marker within the student-athlete population (Melendez, 2006).

The multitude of theories used to explain why female students outperform males are well-documented. However, there are a few widely held explanations that should be mentioned. Such explanations were briefly explained in the student-athlete section at the beginning of Chapter 2, but are worth mentioning again with specific reference to gender.

Female student-athletes have a more developed sense of academic identity, while males typically have a more developed athletic identity.

Due to the ambition of many male collegiate athletes to compete at the professional level, men may be more likely to over-identify with the athlete role at the expense of the student role and other more social roles, thus hindering their adjustment to college. Women’s opportunities to compete beyond the collegiate level, while improving, are still vastly fewer in number. Therefore, a greater focus on educational and social opportunities may result, leading to increased adjustment. (Melendez, 2006, p. 50)
The increased adjustment described by Melendez is not a surprise considering males have been found to be more competitive (Frederick, 2000) and score higher on the Athletic Identity Measurement Scale, thus implying a more defined athletic identity (Lubker & Etzel, 2007). Having a more defined athletic identity may also impact the perceptions and behaviors for each gender towards their academic environment.

For example, in a study of 538 student-athletes Simons et al. (2007) found 39.6% of males felt professors had a negative view of students athletes, compared to only 23.7% for females. When asked if they had ever received a higher grade than they deserved, 13.8% of males and 7.6% of females thought they had received such treatment suggesting males receive more specialized treatment than females. These results imply male student-athletes may view their academic environment in a more skeptical and passive way than female student-athletes.

Additionally, Riemer, Beal, and Schroeder (2000) found male and female student-athletes share the desire to graduate and usually tended to cluster with other student-athletes. However, females reported their peer culture promoted a greater academic orientation, and they did not feel they gained as much recognition as male athletes from the university community and media. These differences reinforce a gender difference in athletic identity, and thus explain how each gender may approach their academic environment with different beliefs and behaviors. Therefore, if athletic identity causes a different approach to an academic environment, it is reasonable to assume differences in athletic identity between genders will produce different academic results for males and females.
In a similar vein, Chee, Pino, and Smith (2005) offered another explanation of female academic achievement. Based on the work from Chodorow (1978) and Gilligan (1982), women are more likely to see “morality as emerging from the experience of social connections and value the ethic of responsibility and care. Men, however, tend to emphasize individual achievement and value autonomy” (Chee et al., 2005, p. 609). These psychological differences contribute to the larger context of social capital (Coleman, 1988) which suggest social relationships are connected to academic achievement. Group membership encourages students to conform to the ideals of the group. This theory seems to directly apply to student-athletes as a result of the intense social connection within an athletic team (Emma, 2008; Riemer et al., 2000).

Whether the reason is athletic identity, psychological development, or social adjustment, female student-athletes outperform male student-athletes by all academic measures. Therefore, the strength of gender as a predictor variable for GPA and retention appears powerful. Given this assumption, it was expected that gender would play a strong role in predicting GPA and retention of student-athletes.

Race

Like gender, race has been a common demographic variable used to evaluate academic performance of student-athletes. Although race can be defined by many criteria, the literature on student-athletes primarily examines Caucasians and African Americans. Data evaluating other races within the student-athlete population is virtually nonexistent due to the overwhelming majority of athletes that are classified as Caucasian or African American.
In fact, the 2008 percentages of male student-athletes in all divisions of NCAA membership are 72.2% for Caucasian, 18.3% for African Americans, 3.9% for Latinos, and 5.6% for other races. For females in all divisions the racial breakdown is 78.8% Caucasian, 11.2% African American, 3.6% Latinas, and 6.4% for other races. At the Division I level, the percentage of African American participants increases to 24.7% for males and an all-time high of 15.7% for females (Lapchick, Little, Lerner, & Mathew, 2009). Given the majority of student-athletes are comprised of two races, and the lack of information on other races, this review focuses on literature examining Caucasian and African American student-athletes, and the relationship of these races to academic performance and retention.

When evaluating race as a potential academic criteria for student-athletes, there are two approaches researchers have taken. The first is to investigate race as one of many variables. This type of approach, which was employed in this study, identifies race as one piece of a larger puzzle, and usually compares different racial groups against a combination of variables. This approach does not focus on race as the main point of emphasis, but does acknowledge race as an important variable to consider within the framework of a research question (Babington, 1997; Chee et al., 2005; Kane et al., 2008; Killeya, 2001; Seldacek & Adams-Gaston, 1992; Sellers, 1992; Shapiro, 1984; Siegel, 1994; Walter, Smith, Hoey, Wilhelm, & Miller 1987; Waugh, Micceri, & Takalkar, 1994). The second approach has been to focus on race as the primary source of study. This approach has typically investigated African American student-athletes in the revenue sports of men’s football and men’s basketball, or commented on the experiences
of African American student-athletes as a whole (Institute of Diversity and Ethics in Sport, 2008; Person & LeNoir, 1997; Siegel, 1994; Young & Sowa, 1992).

Most research using race as a point of comparison reveals a significant relationship with academic performance and retention (Institute of Diversity and Ethics in Sport, 2006). In nearly all studies where race is compared, African American student-athletes were found to perform at lower levels than Caucasian student-athletes. One of the most popular measures of academic achievement and retention are graduation rates.

In the latest federal graduation rate data (entering class of 2001), Caucasian student-athletes graduated at a rate of 68%. African American student-athletes graduated at a rate of 53%. When these numbers were examined by gender, Caucasian male student-athletes had a graduation rate of 61% and Caucasian female student-athletes were at 74%. African American male student-athletes graduated at a rate of 48%, while female African American student-athletes were at 66%. These numbers, when compared to the first year of data available for graduation rates (entering class of 1984), show a dramatic improvement. Caucasian student-athletes began at 59%, which is an improvement of 9%. African Americans have improved by a dramatic 18% from a starting rate of 35% (NCAA, 2009).

The latest graduation rate data demonstrates the powerful relationship of both race and gender to academic persistence. Similar studies investing graduation rates have come to the same general conclusions regarding race and graduation rates (Kane et al., 2008; Shapiro, 1984; Siegel, 1994; Waugh, Micceri, & Takalkar, 1994). As an attempt to explain why graduation rates for Michigan State student-athletes decreased from 1953 to 1980, Shapiro suggested it “might be the increase number of Black athletes who may
have received an inferior high school education” (p. 48). Furthermore, in an interpretation of Matheson’s (2007) work on student-athletes in football and basketball, Kane et al. (2008) wrote:

A contributing factor related to the low graduation rates in these two high-profile sports could be that scholarship athletes are much more likely to be drawn from the African American community, which historically has a much lower graduation rate when compared to other racial and ethnic groups. (p. 102)

Standardized tests have also been found to consistently demonstrate differences in performance by race. In 2008 all Caucasian students scored an average of 528 in writing, 537 in math, and 518 in writing on the Scholastic Aptitude Test (SAT). African American students scored an average of 485 in reading, 491 in math, and 470 in writing. These racial gaps have been consistent for the past several years (Higher Education Research Institute [HERI], 2008). SAT results for student-athletes follow the same general pattern with African Americans showing lower average scores than Caucasians (Babington, 1997; Capraro, Capraro, & Wiggins, 2000; Killeya, 2001; Seldaceck et al., 1992; Sellers, 1992; Walter et al., 1987)

Beyond graduation rates and standardized tests, GPA is a popular measure of academic achievement, and one the current study investigated as a dependent variable in conjunction with race. Whether it was football players (Killeya, 2001; Walter et al., 1987), freshman student-athletes (Babington, 1997; Seldacek & Adams-Gaston, 1992), or a variety of sports and grade levels (Chee et al., 2005; Sellers, 1992), African American
student-athletes have consistently demonstrated lower GPAs than Caucasians. Such a consistent finding supports the use of race as a predictive variable for GPA.

As previously noted, due to the disproportionately large amount of African American student-athletes in the commercialized and revenue-producing sports of football and basketball, much attention has been given to this population. To provide context to this distribution, Lapchick et al. (2009) reported in 2008 the percentage of Division I African American male basketball players reached an all-time high at 60.4%, while female Division I basketball players was at 47.4%. In football, 45.9% of players were African American.

These disproportionally large participation numbers for African Americans in college athletics appear to have remained consistent since the 1980s and 90s. For example, at 100 of the 245 colleges in the Football Bowl Subdivision during 1993, 20% of the African American student body was student-athletes, and at 21 of those schools the number was more than 50%. At Boise State University during 1990-1991, 35 of 40 African American male students were student-athletes (Siegel, 1994).

Due to the large percentages of African American student-athletes involved in college athletics relative to the student body, as well as the social and psychological factors associated with both race and sport cultures, these student-athletes are highly visible and desired research participants. It is this type of research where race becomes the primary focus instead of one variable of interest. The result of such a focus has been to examine the unique experiences of African American student-athletes. For example, Young and Sowa (1992) investigated 142 African American student-athletes in 19 varsity sports to determine if cognitive and non-cognitive variables predicted academic potential.
During data collection, the researchers focused their recruiting efforts on the sports of football, men’s and women’s basketball, cross country, and track because those sports contained 90% of the African American student-athletes (43% from football alone).

Similar to results from Walter et al. (1987), the traditional cognitive measures associated with predicting academic success (i.e., SAT scores) were not found to be most predictive. Instead, traditional factors should be used in combination with other non-cognitive measures (i.e., goal setting).

Similarly, Person and LeNoir (1997) examined 31 African American student-athletes from 11 institutions by conducting interviews and focus groups over a five year span to determine what impacts their persistence and retention. Students were taken from public, private, traditionally Caucasian, and historically Black universities. From this qualitative data, several themes emerged and some generalities were discovered.

In general, these student-athletes are more likely to be retained in their degree program if they are involved in a summer program and work in study groups. They are also more inclined to persist when advising, research experiences, and career seminars are viewed as effective. Faculty-student interactions are found to be less frequent outside of the classroom and office hours. At the historically Black institutions, there is more interaction between faculty and students, which leads to more student involvement with research and internship programs. Additionally, positive levels of student satisfaction are often attributed by the students to the faculty. Overall, non persisters in this study are less likely to engage in research activities; less likely to participate in study groups; and less
These studies, which investigate only African American experiences, are important to the overall understanding of college athletics due to the disproportionally large number of African Americans who participate. Identifying important aspects of the African American student-athlete experience aided in interpreting the results of the current research, especially since race is a significant contributor to a predictive formula of GPA and retention.

Although the majority of literature points to race as a strong predictor of academic performance, it should be noted there is some evidence to the contrary. Melendez (2006) investigated 175 freshman and 30 sophomores to examine the relationship between race, gender, athletic participation, and college adjustment. There were 108 (52%) Caucasian students and 99 (48%) minority students (non-Caucasian) who completed the Student Adaptation to College Questionnaire (SACQ). Student-athletes and non-athletes both completed the survey. Results were consistent with findings from Kaczmarek, Matlock, and Franco (1990), as well as results from Zea, Jarama, and Bianchi (1995), which suggested race was not significantly related to college adjustment. These findings appear inconsistent with most research conducted on student-athletes which suggests race is a significant factor in college adjustment, performance, and retention (Chee et al., 2005; Kihl, Richardson, and Campisi, 2008; Person & LeNoir, 1997; Purdy et. al., 1982; Siegel, 1994). Despite the limited inconsistencies, it is clear most literature supports race as a strong indicator of academic measures. Like gender, the theories that could explain why race is related to academic performance and retention are
too numerous to mention in this review. However, there are a few explanations that are unique to race and academic achievement for student-athletes.

Siegel (1994) described the disproportionate amount of African American student-athletes involved in sports, and their subsequent academic struggles, as the result of the desire for equal opportunity and upward mobility. “In no other area of American life, with the possible exception of the entertainment industry, has merit been so important in recruitment or have Blacks risen so quickly and been so successful” (p. 208). Siegel explained college athletics have provided hope to young African Americans when other social or economic factors may have limited their chance at a better life.

With such hope, however, comes a price. Edwards (1986) argued African American student-athletes feel a much greater pressure to be successful in athletics because of fewer opportunities in other fields. Athletics are seen as an endeavor through which African Americans can gain economic and social success. Athletic excellence can be a source of high status. Consequently, young African Americans may then be channeled into a few sports with a low number of professional opportunities. This approach appears to be different from Caucasian student-athletes who “distribute themselves across a variety of occupations in which real employment opportunities exist” (Siegel, 1994, p. 209).

This differential approach to college athletics provides a clear link to academic performance. Because of the increased pressure to succeed by African American student-athletes, their athletic identity may be overly developed (Ashe, 1977). Academic responsibilities may be devalued because of the belief that college athletics produce a professional opportunity or high level of social status. Lederman (1990) concluded the
reasons for such phenomena are; (a) African American parents who hold similar beliefs and who drive their children towards athletic careers, (b) the glorification of African American athletes by the media, (c) coaches who overemphasize the importance of sport competition, and (d) universities that admit African American student-athletes who have little chance of academic success.

In addition to the explanation that sport is an opportunity for upward mobility, and the consequential de-emphasis on academic achievement which may accompany such a belief, is a modern-day racism that may be applied to African American college athletes. Kihl, Richardson and Campisi (2008) noted African American student-athletes are often ridiculed and stereotyped in their athletic roles. Some believe that “the only reason for their special ‘admit’ into higher education was for their labor and entertainment purposes” (p. 288). Such a belief is perpetuated by the disproportionate amount of African American student-athletes in the highly televised sports of football and basketball.

On the campus of the University of Minnesota, after the men’s basketball team was reprimanded by the NCAA for academic corruption in 1999, modern-day racism occurred. A cartoon entitled “The Plantation” was published in a local newspaper. The cartoon displayed an all African American basketball team playing in front of a predominately Caucasian audience with a caption that read “of course we don’t let them read or write” (Anderson, 1999, p. 8A). This cartoon was condemned by the University as a racial slur (Clark, 1999), and caused many of the African American student-athletes to boycott the media. Some supporters of the cartoon claimed it challenged the
community to evaluate the exploitation of the student-athletes on the men’s basketball team (Kihl et al., 2008).

These attitudes serve to perpetuate racial tension from both student-athletes and outsiders who view college athletics with a level of skepticism. These skeptics may be from within the walls of higher education, and may be fellow students (Sailes, 1993) or faculty members responsible for providing the educational experiences to student-athletes (Simons et al., 2007). For example, Simons et al. reported 41.9% of African American student-athletes believe their instructors hold a negative perception of college athletes. In contrast, 34.1% of Caucasian student-athletes held that view. Furthermore, 28.6% of African American student-athletes reported they were suspected or accused of cheating compared to 6.2% for Caucasians. These results suggest:

African American athletes report a much higher degree of negative perceptions and treatment than White and other athletes. This finding may be explained in part by the fact that African American athletes are subject to the double stigma of being Black and an athlete. The lack of intellectual ability is part of both stigmas. (p. 266)

Based on the literature, there is strong evidence race has a relationship with academic performance. In virtually all measures comparing African American student-athletes with Caucasian student-athletes, there is a racial divide in performance. Understanding such differences, as well as why such differences occur, can aid higher education personnel in predicting academic performance and programming needs.
Distance From Home

Students have been found to choose a college or university for a variety of reasons. One of the consistent reasons for their choice is distance from their home (Briggs, 2006; Higher Education Research Institute, 2008; Cunningham, 1997; Cunningham & Fickes, 2000; Jonas & Popovics, 1990; Lam, 1984; Martin, 1996; Mooney, Sherman, & Lo Presto, 1991; Rajapaksa & Dundes, 2003). This variable can be particularly powerful for some individuals, and only a minor consideration for others. Given the relatively large number of student-athletes who are recruited to Division I institutions far from their homes, this variable may be particularly relevant to predict academic performance and retention.

According to the Higher Education Research Institute’s (HERI) 2008 freshman survey, which examined over 400,000 entering freshman at 700 colleges and universities, 20.1% of students reported it was very important to live near home, while 29.3% reported it was somewhat important. These results suggest living near home played a crucial role in college choice for many freshmen. Furthermore, the results of the HERI study revealed 35.5% of freshman attended college within 50 miles of their home, 17.3% lived within 51-100 miles, 33% lived within 100-500 miles, and only 14.1% lived more than 500 miles from their homes. It is clear with over 50% of college freshman living within 100 miles of their homes, distance to home is a variable many college students consider.

There have been several studies confirming distance from home is an important consideration in college choice. Lam (1984) investigated 43 students who had withdrawn from Brandon University with the intent to create a mathematical formula predicting dropouts. Lam’s results revealed seven factors that were significant in predicting dropout
rates. In order of significance these factors were considered most important; student status (i.e., part-time or full-time), residence (i.e., on or off campus), financial resources (i.e., number of financial resources available to students), distance from university (from hometown), goal fulfillment (did students reach their pre-determined goal), and satisfaction with overall university program atmosphere (i.e., the gross perception of their programs including faculty and services).

Distance of hometown from the University was found to account for eight percent of the probability of dropping out. That is, those whose hometowns were within 150 miles radius of the University were less likely to withdraw compared with those who came from further away. (p. 79)

Jonas and Popovics (1990) found similar results when they investigated 76 students who were accepted to attend Cardinal Stritch College in Wisconsin. They found major influences on final college decisions included size, distance from home, reputation, faculty, career placement, and financial aid. Cunningham (1997) and Cunningham and Fickes (2000) discovered comparable results at the Pennsylvania College of Technology. In both studies at this University, the researchers found distance from home was a powerful reason for their choice of college.

Briggs (2006) and Martin (1996) found similar results outside of the United States. Briggs examined 651 students at six contrasting universities in Scotland to determine a model for predicting institutional choice. Although the final conclusion revealed college decisions are complex, there was consistent evidence to determine three factors were significant to predict college choice. Those factors were academic reputation, distance from home, and location. Martin (1996) found that of the 774 first-
year students who were attending the University of South Australia distance from home strongly affected their choice. “The closeness of a university campus from the students’ home usually sets the context for the decision of which university to attend” (p. 11).

It is obvious many students consider distance from home an important factor when choosing their college or university. But what makes distance from home an important factor? What is it about traveling far from home that would make the college experience less fulfilling for some students? The answer is most likely linked to homesickness.

According to Fisher (1989) there are two reasons distance from home might lead to homesickness. First, “the greater the distance incurred the greater the likelihood of change in culture - hence the greater the likelihood of culture shock” (p. 72). This concept makes sense considering the farther students are from their family, friends, and social networks, the more likely their daily lives are altered. This culture shock can be particularly powerful for student-athletes given the level of athletic identity that may have existed before college due to high school athletic success (Emma, 2008).

Second, Fisher (1989) noted the greater the distance, the greater the student will feel “cut off from home and unable to visit it” (p. 72). This feeling may be enhanced because the financial cost of traveling home might be difficult on a tight student budget. Rajapaksa and Dundes (2003) confirmed this logic when they compared a group of international students to a sample of U.S. students. The 182 international students were more likely to feel lonely, homesick, and as if they had left a part of themselves at home. This reasoning may be particularly relevant for student-athletes because they are rarely able to travel home due to strict practice schedules and weekend competitions.
Oftentimes holidays or semester breaks are the only times student-athletes are able to travel home, particularly if their university is a great distance from their hometown.

Given Fisher’s explanations, it is easy to comprehend the link between distance from home and homesickness. However, Mooney et al. (1991) found that the actual distance may be less important than perceived distance for college adjustment. In a study of 88 female college students, those who perceived the “distance from home as ‘just right’ reported a more successful college adjustment than those who perceived the distance as ‘too far’” (p. 447). This finding may also be particularly important for student-athletes who may be limited in their travel, or who may have friends and family who have too far to travel for a visit.

These connections with homesickness are important because homesickness has been found to have serious consequences on social and psychological characteristics. Both homesick and homesick prone individuals seem to be preoccupied with worries and are not able to concentrate as well as the non-homesick. They are more vulnerable to failures in perception, memory and motor function. Homesickness, whether chronic, prone or recovered, was also related to more difficulties in making new friends, fear of heights, dislike of traveling alone, less membership of a club in childhood and school phobia. (Van Tilburg, Vingerhoets, Van Heck, & Kirschbaum, 1999, p. 193)

Distance from home may be especially relevant to student-athletes because of the recruitment process involved in their college choice. Student-athletes are often courted by coaches from institutions across the country and offered scholarships that pay for their
education (Baldwin, 1999). Sometimes, distance from home may not feel like a consideration if only a few scholarships are offered from schools far away. If an entire education is funded by an athletic scholarship, distance from home may be sacrificed, which could potentially impact academic performance or retention.

Academic Variables

Beyond demographic variables, predicting academic success is often accomplished using specific academic variables. This line of thinking is clear; in order to predict academic outcomes one can utilize previous measures of academic performance. Some of the more common variables used to predict college academic performance include standardized testing and multiple high school measures. The current study utilized these academic variables to predict GPA and retention of college student-athletes.

*Standardized Test Scores (SAT & American College Testing [ACT])*

Standardized tests are one of the most common tools to predict academic performance of college students. These tests are designed to measure the aptitude or achievement of students by providing scores on a variety of measures. College admissions departments often use the scores from such tests to make admission decisions. The two most common standardized tests used to predict academic performance are the SAT and the ACT.

The SAT “is the nation’s most widely used admissions test among colleges and universities” (The College Board, n.d., ¶ 1). This standardized test is designed to evaluate students’ knowledge in reading, math, and writing. The SAT was first introduced in 1926 (Cantrell, 1999). Since then, the SAT has evolved to include several test versions, with the most recent update in March of 2004 (The College Board, n.d.). The College Board,
which is “a national nonprofit membership association dedicated to preparing, inspiring, and connecting students to college opportunity,” (Burton & Ramist, 2001, p. preface) provides the SAT service. This organization is composed of more than 3,900 schools, universities, and educational organizations.

The College Board also performs extensive research on the validity of the SAT through the Validity Study Service (VSS). This service, established in 1964, allows universities to provide SAT data for analysis. This massive amount of data from universities across the United States is a wealth of knowledge for the predictive validity and general trends of college grades and SAT scores (Morgan, 1989). “Literally thousands of validity studies have been conducted for institutions throughout the country for more than a half-century. The evidence is clear: The SAT works and it works very well in many different circumstances” (The College Board, 1997, p. 4).

The evidence for the predictive validity of the SAT comes primarily from the VSS by means of quantitative studies involving some measure of college achievement. Most often, the measure of achievement is cumulative GPA (Bridgeman, McCamley-Jenkins, & Ervin, 2000), and most studies involve correlations at only one institution (Boldt, 1986). For example, in a study examining gender bias, Young (1991) observed the correlation of SAT scores to cumulative GPA for 1,564 students at the same institution. The findings showed a correlation coefficient of .46 for all students. Similar correlation coefficients in the range of 0.3 - 0.5 can be found in numerous studies from single institutions indicating a link between SAT scores and college achievement (Bridgeman & Wendler, 1989; Elliott & Strenta, 1988; Moffatt, 1993; Nettles, Thoeny, &

Studies conducted at one institution provide valuable information for that particular institution. However, such studies may cause skepticism that results are generalizable to all institutions. In an effort to demonstrate validity generalization, which was approved by the National Council on Measurement in Education in 1985, Boldt (1986) analyzed ninety-nine validity studies from the VSS. The results indicate average validities were high, and “substantial validity was the rule” (p. 1). In fact, when taking into account all SAT test-takers at those institutions, average correlation coefficients rose to .55. These numbers, both for individual and multiple institutions, suggest the SAT has a relatively strong correlation with overall college academic performance across a wide variety of institutions.

The ACT resembles the SAT in many ways. Similar to how the SAT touts itself as the most widely used college admissions exam (The College Board, n.d., ¶ 1), the ACT claims to be “America’s most widely accepted college entrance exam” (American College Testing, 2009b, ¶ 1). Each test has a section measuring math, English/verbal, and writing skills. The ACT also offers a reading and science section of the test, as well as an overall composite score (American College Testing, 2009d). Both tests are taken using similar test-day procedures. The ACT also offers similar services to the SAT’s VSS whereby institutions can utilize the ACT research department to better understand how to best interpret and use ACT scores for the betterment of their colleges and universities (American College Testing, 2009e, ¶3).
Although the term ACT is most often referred to as a test, ACT is an entire organization founded in 1959 that offers more than a hundred assessment, research, and programming services to both educational and workforce environments (American College Testing, 2009c). The first test devised by the ACT foundation was the ACT assessment test (now known as the ACT) which was designed to fulfill two purposes. First, the ACT attempted to “help students make better decisions about which colleges to attend and which programs to study” (¶ 4). Second, the ACT was designed “to provide information helpful to colleges both in the process of admitting students and ensuring their success after enrollment” (American College Testing, 2009e, ¶ 4).

As researchers discovered the relationship between standardized tests and GPA, they began to investigate this relationship for various student subgroups. When separated by gender, a common pattern seemed to emerge. The SAT seems to slightly underpredict college GPA for women, and overpredict GPA for men (Cleary, 1992; Friedman, 1989; Hyde, Fennema, & Lamon, 1990; Stanley, Benbow, Brody, Dauber, & Lupowski, 1992; Willingham & Cole, 1997).

Ramist, Lewis, and McCamley-Jenkins (1994) reported the average overprediction and underprediction using SAT scores to predict first-year grades was -.06 for women, and +.06 for men. For example, women predicted to earn a 3.0 first-year GPA would actually receive a 3.06, while men predicted to earn a 3.0 would actually earn a 2.94. When Ramist et al. accounted for different majors and various course selection patterns, the overprediction for males was reduced to +.03, and females to -.03. Although these results suggest the SAT predicts differently for men and women, the
overpredictions and underpredictions are relatively small and consistent, which provide further evidence of the SAT’s predictive validity.

Like males, the relationship of SAT scores to college GPA for African American students has been slightly overpredicted (American Association for Colleges for Teacher Education, 1992; Bowen & Bok, 1998; Friedman & Kay, 1990; Johnson, 1993; Nettles et al., 1986). The greatest difference reported in any study for African American students, when compared with their Caucasian counterparts, was -.22 (American Association of Colleges for Teacher Education, 1992). However, the opposite effect was found with a combination of SAT and high school records, indicating an underprediction of college GPAs by +.05.

In the largest study to examine such a relationship, Bowan and Bok (1998) investigated 2,300 African American student’s SAT scores in relationship to high school rank, socioeconomic status, college selectivity, and major. The results indicated the dependent variable of cumulative college class rank to be virtually the same for African American students as it was for all other students when predicted by SAT score. In fact, SAT score was the strongest predictor of success for African American students, as well as all students as a whole. Similar results were found for Hispanic students (Pearson, 1993), Asian American Students (Fuertes, Sedlacek, & Liu, 1994), and students with disabilities (Ragosta, Braun, & Kaplan, 1991).

Results for race and culture, like those for gender, reveal that although there may be slight differences between such subcategories of test-takers, the SAT is a relatively stable predictor of college academic performance for all students. Any differences in predictability is due to normal variation in testing procedures which include, sample size
variations, differences in interests or expectations, and unequal educational opportunities. “Understanding why differences exist is considerably more useful than simply dismissing differences as bias” (The College Board, 1997, p. 1).

Not all literature suggests standardized tests are a valid and reliable predictor of academic success. Critics of standardized tests suggest differences in predictability are the result of more than normal test variation, and oftentimes reveal flaws in the test itself (Worthen & Spandel, 1991). The recent critiques of standardized testing are the result of many years of debate. The first public critic of these tests was made by Banesh Hoffman. In 1961 Hoffman wrote an article in Harper’s magazine titled *The Tyranny of Multiple Choice Tests*. Hoffman suggested multiple choice tests unfairly penalized deep thinkers, and a reliance on such tests would have “dangerous consequences, not only for education, but for the strength and validity of the nation” (p. 37).

Hoffman’s article laid the groundwork for individuals to question the validity of standardized testing. Such criticism ultimately led to the 1965 Senate and House Committee hearings on standardized testing. Although these hearings dealt with many aspects of psychological testing, one of the primary topics was the applicability of standardized tests for the purpose of college admission decisions. From those hearings, numerous concerns over the predictive validity of standardized tests were raised. From that point forward, the use of standardized testing has been the topic of an ongoing debate (Cantrell, 1999).

The critiques of standardized testing, particularly aptitude tests such as the SAT and ACT, usually fall under one of four categories described by Worthen and Spandel (1991). The first critique is standardized tests are poor predictors of individual student
performance. This critique is ironic because supporters of standardized testing point to the relatively constant correlation between test scores and academic achievement. However, as critics are quick to acknowledge, those correlations are made using large groups of students and cannot accurately predict any one individual’s performance.

Consider this explanation by Worthen and Spandel:

> When a child scores well on a standardized reading test, that doesn’t mean we can kick back and say, “Well he’s a terrific reader, all right. That’s how it will always be.” Ridiculous. Maybe he felt extra confident. Maybe the test just happened to touch on those things he knew well. But if we look at all the students with high scores and all those students with low scores, we can safely predict more reading difficulties among students with low scores. (p. 66)

This critique also appears relevant within the previously mentioned research regarding student subgroups. Although small, the differences for gender, race, and socioeconomic status are documented (Young & Kobrin, 2001). This evidence gives credence to the idea that as more variables are extracted from the overall student population, more differences are found. Thus, credibility is given to the argument that standardized test scores are good predictors of group achievement as a whole, but suspect at predicting individual scores.

Nearly all research completed on the student-athlete subgroup supports the first critique by Worthern and Spandel (1991). Simply stated, standardized tests are, at best, a moderate predictor of academic success for student-athletes, but often not a predictor at all (Babington, 1997; Baumann & Henschen, 1986; Lang, Dunham, & Alpert, 1988;
Sedlacek & Adams-Gaston, 1992; Walter et al., 1987; Waugh et al., 1994; Young & Sowa, 1992). The results from these studies seem to suggest standardized tests are one small piece to a predictive puzzle for the relatively small student subgroup of student-athletes, and scores should be used in combination with other variables to best predict academic performance. The current research is predicated on this logic.

The second critique noted by Worthen and Spandel (1991) was standardized test results can label students in harmful and damaging ways. This critique is most often seen in elementary and secondary education with achievement tests. Students can be placed in advanced or remedial courses based on one such test. SAT or ACT scores can be used to place college students in categories such as honors, at-risk, or probation. Each of these categories carries with it certain expectations that may shape the behavior of students. According to Worthen and Spandel, this labeling phenomenon can have a drastic impact on the motivation and development of students.

Third, and probably the most controversial critique of standardized testing, is alleged racial, cultural, and social bias (Zwick, 1999). Critics claim standardized tests “favor economically and socially advantaged children over their counterparts from lower socioeconomic families. Minority group members note many tests have a disproportionately negative impact on their chances of real opportunities in education and employment” (Worthen & Spandel, 1991, p. 67).

Although some research from the VSS suggested there is only a small difference between various subgroups (American Association of Colleges for Teacher Education, 1992; Bowen & Bok, 1998; Friedman & Kay, 1990; Fuertes et al., 1994; Johnson, 1993; Nettles et al., 1986; Pearson, 1993), many researchers argue racial differences are often
overlooked, and should not be easily dismissed. In a study of multiple standardized tests taken by elementary through high school students, Antonucci (1999) wrote: “There isn’t a state in the nation without a significant gap in test scores between races. This gap leads to attacks on the tests, attacks on the public school system, attacks on teachers and administrators, and attacks on politicians” (p. 16).

In an effort to investigate why such gaps existed, Thompson (2007) conducted a study which utilized both surveys and interviews for 102 African American high school students in California. This study found half of the respondents indicated they did not do their best on the SAT because they felt it was a waste of time and did not specifically apply to them. Additionally, some students indicated they take too many tests, they had not been adequately prepared for the tests, and probably would not benefit from doing well on such a test. Thompson reported these results are disheartening because there is a lack of understanding from many minority students about the purpose of standardized testing. According to Thompson, the primary conclusion to draw from this study is “adults should be wary of assuming that the scores are an accurate reflection of what students know and an accurate reflection of their skill levels” (p. 25).

The final critique highlighted by Worthen and Spandel (1991) was standardized tests only measure limited and superficial knowledge. Although test designers utilize many methods of testing, students are only tested on a designated number of specific questions given at one time. There is little chance such a limited amount of questions in a limited amount of time can accurately predict success for any individual student.

The designers of these tests do the best job they can in selecting test items that are likely to measure all of a content area’s knowledge and skills that
the nation’s educators regard as important. But the test developers can’t really pull it off. Thus, standardized achievement tests will always contain many items that are not aligned with what’s emphasized instructionally in a particular setting. (Popham, 1999, p. 11)

In a much more philosophical argument about the merit of testing, Bigelow (1999) attacked the design of standardized tests in relationship to multiculturalism. He wrote;

> When we look directly at the tests, their limitations and negative implications for multiculturalism become most clear. Test questions inevitably focus on discrete facts, but cannot address the deeper, multifaceted meaning of facts. . . . For example, one question asked which Constitutional amendment gave women the right to vote. Students could know virtually nothing about the long struggle for women’s rights and get this question right. (p. 38)

Such tests, argued Bigelow, lack questions that would measure the deeper thinking skills needed to prepare students for higher education. Therefore, the message to memorize facts, instead of understanding the multifaceted background of those facts, is what appears important to standardized test takers.

There is obvious disagreement about the appropriateness of using standardized tests to predict academic success. Because the SAT is the test most used by college admissions departments (The College Board, n.d.), it is prudent to consider both the evidence for and against such a test when determining the extent of its use. Before
determining that extent, it is important to note that universities are legally allowed to use standardized testing any way they see fit (Cantrell, 1999).

Considered one of the four essential freedoms for universities, admission decisions have been challenged many times in the legal arena. In Wirsing v. Board of Regents of University of Colorado (1990), the court found under the concept of academic freedom universities are free to determine who may teach, what may be taught, how it should be taught, and who may be admitted. This ruling has been the general finding of similar court cases challenging admissions decisions (Enns v. Board of Regents of University of Washington, 1982; Knight v. State of Alabama, 1991; North v. West Virginia Board of Regents, 1985). However, in Sharif v. New York State Education Department (1989), the court found the SAT discriminated against females due to the underprediction of academic performance.

From a legal perspective it is clear institutions are allowed to use standardized testing for admissions decisions, but it is also clear the courts believe predictive validity of such tests are questionable. For this reason, the decision in Ayers v. Fordice (1995) recommends that if universities use the SAT in admissions decisions, they should also use some other combination of criteria to accompany those decisions.

The recommendation by the courts to use a combination of admissions criteria is evidence that the predictive validity of the SAT is limited. Although the VSS provides correlation coefficients for large groups in the .30 - .50 range (Boldt, 1986), such correlations are insufficient to make definite academic predictions for individual students. For this reason, the predictive validity claimed by supporters of the SAT is only applicable to large groups of students (Worthen & Spandel, 1991).
From a statistical perspective, the SAT to GPA correlations found by the VSS are moderate at best. “Correlations between .40 and .60 are often found in educational research and have theoretical or practical value, depending on the context. A correlation of at least .50 must be obtained before any crude predictions can be made about individuals” (Fraenkel & Wallen, 2006, p. 344). The moderate correlation coefficients routinely found in SAT correlational research are not powerful enough to use as the sole predictor of academic performance. Such information is disturbing when one considers that in 1985 44% of the American Association of Collegiate Registrars and Admissions Officers considered test scores as very important, or the single most important factor in admissions decisions (Schaffner, 1985).

Furthermore, Sacks (1997) reported only 16% of the variation in freshman grades can be predicted using the SAT. Better predictors of such variation include high school class rank and high school performance. Current research by The College Board acknowledged using the SAT in combination with high school information appears to be the most accurate predictor of academic success (Bridgeman & Wendler, 1989). “The combination of SAT scores and high school records provided better predictions than either grades or test scores alone” (Burton & Ramist, 2001, p. 16).

Given the similarities between the SAT and ACT, both tests are subject to the strengths and weaknesses of standardized testing. However, from a practical standpoint, these tests are still widely used to help make college admission decisions. Given the inconsistent results, as well as the differing levels of support and criticism, more research on these tests is warranted. In particular, any research contributing to the work on subgroup populations (i.e., student-athletes) will aid the overall body of knowledge
regarding the predictive value of standardized testing. Therefore, both of these standardized tests were used as predictor variables in the current study.

*High School Measures (GPA, class rank, size)*

Although standardized tests are routinely used to predict college performance and assist with admission decisions, it has been consistently found a more accurate predictor of college GPA comes from high school academic information (i.e., high school GPA and class rank) (Chesborough, 1993; Espenshade, Hale, & Chung, 2005; Melendez, 2006; Zea et al., 1995). As previously noted, high school information is particularly powerful when combined with standardized tests (Baker & Siryk, 1989; Baumann & Henschen, 1986; Burton & Ramist, 2001). Within the student-athlete population, these findings are consistent.

Investigating high school measures in combination with SAT was particularly popular during the mid 1980’s when the NCAA enacted legislation known as Proposal 48 on August 1, 1986. This legislation mandated graduating high school seniors must score a combined 700 on the SAT or a 15 ACT composite score, and have a minimum high school GPA of 2.0 to be eligible for college athletic competition (Baumann & Henschen, 1986). Proposition 48 sparked research within the athletic community to determine if these variables correlated to actual college academic performance.

In one of the first studies to examine the Proposition 48 standards, Baumann and Henschen (1986) examined 753 student-athletes who attended the University of Utah between 1974 and 1984. ACT scores, predicted college GPA, high school GPA, race, and sport were compared with actual college GPA. Results revealed both ACT scores and high school GPA were moderate predictors of college GPA, but high school GPA was a
statistically stronger predictor. Regression analysis revealed utilizing both ACT scores and high school GPA was the best predictor for the overall group of student-athletes.

In a similar study at the University of Michigan, Walter et al. (1987) examined 183 football players from 1977 to 1983 to determine if the standardized test scores, high school GPA, and race would predict college GPA and graduation rates. They found SAT scores were not predictive for African American students, and only weakly related to college GPA for Caucasians. High school GPA, however, accounted for 20% of the variance in college GPA for African American students and 15% for Caucasian students. Graduation rates for African Americans were predicted equally well by both high school GPA and college GPA. High school GPA, however, did not predict graduation for Caucasian students. Walter et al. concluded that for student-athletes “high school grade point average is the single best predictor of college success among predictors commonly used and is not improved by adding an aptitude measure” (p. 278).

Another study investigating college football players was conducted by Lang et al. (1988). Twenty three variables were identified as potential predictor variables for the 94 participants in this study, who happened to be the 1986-1987 University of Miami football team that won the 1987 National Championship. High school GPA was found to be one of the six primary variables that combined to predict college GPA, while SAT scores were not significant. “The fact that GPA is a better indicator of academic success than SAT scores within our population has some implications for selection as well as for program development” (p. 219).

It is clear high school GPA has some predictability for student-athletes as a whole, but it also appears race is important to consider when exploring high school GPA.
As noted by Walter et al. (1987), high school GPA was found to predict college GPA better for African American football players than for Caucasian football players at the University of Michigan. Bauman and Henschen (1986) also found high school GPA was a better predictor for African American student-athletes than for Caucasians student-athletes.

These findings confirm research by Allen (1986) and Nettles (1984) which found high school GPA is a better predictor of academic success for African Americans in the overall college student population. However, research by Sedlacek and Adams-Gaston (1992) found high school GPA was a better predictor for Caucasian students than for African Americans, while Sellers (1992) found it predicted equally well for either race. It appears the evidence for race is somewhat inconsistent, but it seems clear high school GPA is an important variable to predict college academic performance.

In addition to high school GPA, high school class rank is a variable used to predict college academic performance. Ranking students is a different measure than GPA because it is a school-specific measure relative to performance of other students, rather than averages based only on individual performance. “Ostensibly, the reason for class rank is to meaningfully distinguish among members of a given graduating class” (Murphy, 1971, p. 205). The process of assigning class rank is relatively simple. Students are assigned a number value based on a predetermined set of criteria (oftentimes GPA). After students are assigned numbers, they are placed in numerical order with the higher number representing the better student in a particular class.

Predicting academic success using class rank is a common practice. For example, Schwartz and Wilbur (1981) investigated over 4000 students in 80 different high schools
who participated in the Syracuse University Project Advance program. This program allowed students to participate in joint high school and college classes during their senior year of high school. Performance in Project Advance was measured in addition to other common predictor variables (i.e., SAT and high school rank). Results from multiple regression analysis revealed high school rank was a good predictor of first-semester college GPA, while SAT scores were not predictive.

Similarly, Ruban and Nora (2002) examined 102 low-achieving college students, and 226 high-achieving college students to determine what precollege variables best predicted inclusion to these groups. The results suggested using a variety of precollege and self-regulated learning strategies are most useful to determine achievement levels. More specifically related to class rank, the authors note:

High school rank, which was used in this study as a proxy for students’ academic aptitude, provided an incremental contribution of 68% to the classification validity of the model, which reflects on the importance of considering high school rank in making college admissions decisions. (p. 20)

Similar results suggesting the importance of class rank for a variety of populations were found by Cohn, Cohn, Balch, and Bradley (2004), Dittmar (1977), Hengstler and Reichard (1980), Houston (1980, 1983), and Slack and Porter (1980).

Although the preceding studies support class rank as a predictor of college academic performance, it is important to note class rank is not without criticism. Murphy (1971) explained that because there is so little difference between each student’s rank, especially students in the middle of a class, there is a need for a more accurate ranking.
system. His solution, as a vice principal and former high school counselor, was to chunk students into deciles. However, this created a problem because college admissions counselors could not accurately use the class ranking system to evaluate his students for college admission. In other words, college admissions personnel are trained to define high school rank as one number which represents each student.

Lang (2007) found the same general problems when he examined 232 of the largest 500 high schools in the United States to determine if students have proper incentives to enter college, and if high schools are providing colleges consistent information about student rankings. Lang’s conclusions stated:

In summary, the majority of high schools (in the sample) place additional weight on advance placement and, at times, honors courses. However, this is typically done using methods that have flaws including inequitable premiums, rewarding students for doing less, and confusing and conflicting information. The findings of this survey suggest that current State-based ‘percent-plans’ or other guaranteed admission programs may not be targeting the intended students. (abstract)

The percent-plans referred to by Lang are admissions agreements within the states of California, Texas, and Florida which guarantees if a student finishes in the top of their graduating class they are automatically admitted to their public university system. In California, students must be in the top 4%, Texas requires the top 10%, and Florida allows the top 20% (Kahlenberg, 2003). Critics of such plans suggested using class rank to admit the top students only perpetuates a system that already rewards students of
privilege, and eliminates many qualified students of different races or backgrounds (Lang, 2007).

The issue of using class rank is further complicated when used in conjunction with high school class size and quality of the high school. “Inclusion of high school class rank without considering high school class size in an analysis results in output of limited value” (Ashbaugh & Thompson, 1993, p. 335). For example, if a strong academic student’s class rank is average because they attend a very good high school with a small class size, they are less likely to get accepted to the college of their choice. Espenshade et al. (2005) described this phenomenon as the small frog in a big pond scenario.

Because of the important role that class rank plays, students with very good grades and strong test scores at talent-rich high schools are at a competitive disadvantage relative to their even-more-gifted peers. Unless these students are at the top of their class, they are more likely to gain acceptance to selective colleges and universities if they attend a less prestigious high school. (p. 270)

Although class size can influence the powerfulness of class rank, it should be noted class size has also been used to predict academic performance. The logic behind using class size as a predictor of academic success is a simple one. Larger schools usually have more resources, more diversity, and can offer students more educational and extracurricular opportunities (Ashbaugh & Thompson, 1993; Geffert & Christensen, 1998; McDaniel & Graham, 1999).

For example, in an attempt to discover how knowledgeable incoming freshmen were about using a library for research, Geffert and Christensen (1998) found students
from larger high schools came to college with several advantages. First, students tended to have experience being taught research by a high school librarian. Second, students had more access to, and more experiences with, online catalog searches and electronic periodical indexes. Finally, students from larger high schools had access to and used interlibrary loan services more than did students with smaller graduating classes. Although isolated to library research skills, results from Geffert and Christensen’s research are an important demonstration of how schools that serve larger student populations offer resources and training which may not be available at schools serving small numbers of students.

Similar results have been found by Ashbaugh and Thompson (1993) as they examined variables that may impact exceptional performance on the Uniform Certified Public Accounting (CPA) exam. Participants in this study included 234 CPA candidates at a medium-sized Midwestern university. A total of 136 candidates passed all parts of the exam on their first attempt. The remaining 98 students failed at least one part of the test. High school class size was one variable that distinguished candidates who passed all parts of the exam on the first attempt from the students who failed at least one part of the exam on the first attempt. The larger the high school, the greater likelihood students would pass on the first attempt. Results by Ashbaugh and Thompson reaffirm students who had access to more high school resources achieve at a higher academic level in college.

First-Semester GPA

Although high school variables appear to be consistent predictors of academic performance, first-semester college GPA is also a likely predictor. The logic behind using
first-semester GPA to predict overall GPA is basic. First-semester GPA will predict future GPA and retention because it is a direct measure of similar performance within higher education. Furthermore, first-semester GPA represents a powerful marker many students use to evaluate their ability to succeed in higher education. “Students whose first academic experience in college is positive and successful are more likely to persist towards their goals than those who have negative initial experiences” (Driscoll, 2007, p. 4).

Historically, first-semester GPA has been used as a dependent variable. That is, many researchers have examined variables that may influence first-semester GPA rather than identifying first-semester GPA as a predictor of other achievement. For example Walter et al. (1987) examined the relationship between SAT scores and first-semester GPA for football players at the University of Michigan. Babington (1997) used first-semester GPA to distinguish between student-athlete succeeders and non-succeeders at Indiana University. This information was also related to traditional variables (e.g., high school information) and nontraditional variables (e.g., academic plans) to determine which variables best predicted successful GPA. At historically Black institutions, Young and Sowa (1992) and McDaniel and Graham (1999) found a variety of academic variables best predicted first-semester GPA. Rarely has first-semester GPA been used as an independent variable to predict future GPA or retention.

When used as an independent variable, results suggest first-semester GPA is a good predictor of academic success. For example, to determine how important first-semester GPA was to retention and graduation of both freshman and transfers, Belcheir (2001) examined 1,692 new freshman and 767 new transfers at Boise State University.
Participants were checked for graduation status after four, six, and ten years. Results indicated first-semester GPA, in combination with continuous enrollment, strongly predicted graduating at all year markers for both freshman and transfers. In fact, “at the four year mark, each unit increase in GPA improved the probability of graduating by a factor of 1.85. At six years, the odds were 2.05, while at ten years, the odds improved by a factor of 1.87” (p. 8). Additionally;

First-semester GPA probably played the most important role in increasing the odds of graduation. The impact was clear in predicting freshman graduation for those who returned for additional fall semesters. In this case, each unit increase in GPA approximately doubled the odds of graduating at four, six, and ten years. Thus, a student with a 4.00 GPA would be approximately sixteen times more likely to graduate than a student with a 0.00 first-semester GPA. (p. 15)

The results found by Belcheir provide powerful evidence for the predictability of first-semester GPA upon retention. Similarly, Moore (2006) found for 263 students enrolled in an introductory college biology course, first-semester GPA and class attendance were strongly correlated to class performance. That is, students who earned higher first-semester GPAs were more likely to have continued academic success as they progressed. “This finding underscores the importance of students getting off to a good start in college, because their first-semester GPAs are strongly correlated with their subsequent academic performances” (p. 116).

Similarly, Driscoll (2007) investigated factors which would most likely predict the transfer of California community college students to a four-year university.
this cohort, 64.3% of the students who enter community college have the goal of transferring to a four-year college to earn a bachelor’s degree. However, 25% of those students who entered in the fall do not return to school the following spring. Among the many variables that impact these numbers is first-semester GPA.

For all races in Driscoll’s investigation high first-semester GPA correlated with transfer to a four-year university. Almost 50% of the African American and Latino populations with at least a 3.0 GPA transferred, while only 30.6% with GPAs below a 3.0 transferred. For Caucasians 60.3% with a GPA over 3.0 transferred, and Asians who had a GPA over a 3.0 transferred at a rate of 65.2%. Overall, the results indicated “students who start fast, that is, who take a heavy course load of transfer-eligible course in their first semester and do well in them, are much more likely to achieve the goal of transferring to a four-year college” (p. 12).

In a slightly different use of first-semester GPA, St. Thomas (1982) sought to determine if a 1.75 GPA was the proper cut-off for nurses to continue in their program after the first semester. At the time of the research, a 1.75 GPA was required to continue. Using first-semester GPA as the independent variable, and scores from the state nursing board examination as the dependent variable, it was determined a GPA of 1.75 was too high. It was found with 95% accuracy that students with a first-semester GPA of 1.5 or higher would pass the state exam. In this case, first-semester GPA was found to be particularly useful to determine performance on a state exam, thus causing the author to call for a policy change at Vermont College, and validate first-semester GPA as a useful evaluation tool.
These results suggest when first-semester GPA is used as an independent predictor variable, rather than as a dependent variable, its predictability for future academic success is strong. However, because there is limited evidence of first-semester GPA as an independent variable, especially within the student-athlete population, more research is needed. The current research investigated the predictive ability of first-semester GPA to the overall GPA at the end of the freshman year. This measure was combined with other high school measures to predict GPA and retention.

Major

Identifying all potential majors, and their impact on GPA and retention, is not the goal of this study. There are too many majors and too small of a student sample to accomplish such a task. Instead, this study is designed to predict both GPA and retention based on whether or not a student-athlete declared a major upon entering college. Therefore, student-athletes in this study were classified as having a major, or being undecided.

The logic behind identifying undecided students as a possible risk is both supported and refuted by research. Before discussing such research, it is necessary to note the importance of choosing a major. “There is perhaps, no college decision that is more thought-provoking, gut wrenching and rest-of-your life oriented - or disoriented - than the choice of a major” (St. John, 2000, p. 22). In fact, Roese and Summerville (2005) found the most frequently identified life regret for Americans are educational choices, including choice of major. Furthermore, Gordon and Steele (2003) report 63% of students feel somewhat anxious about choosing a major, and 21% report feeling very anxious.
The path to choosing a major, if taken seriously, can be intense. Beggs, Banham, and Taylor (2008) suggested there are four categories students must consider when choosing a major; sources of information and influence, job characteristics, fit and interest in subject, and characteristics of the major/degree. In a similar manner, Cooperthwaite and Knight (1995) suggested this important decision is based on three main areas they define as inputs (e.g., race, gender, academic ability, family background, personality factors, etc.), involvement indicators (e.g., college activities, money, friends, work, children, community orientation, etc.), and environments (e.g., faculty, curriculum, involvement in sports or recreation, cost, prestige, institution type, etc.). Furthermore, Huang and Healy (1997) suggested there is an interactive relationship that exists between particular majors and level of work involved in those majors.

Given the importance, and large number of variables involved in a choice of major, it is reasonable to assume students who have chosen a major have a more defined and focused approach to their academics. Conversely, “students who are academically undecided when they begin their first year of college are assumed to have certain academic and career exploration needs” (Gordon & Steele, 2003, p. 19). The literature supports, and refutes, this logic.

Research supporting the notion that undecided students are more at risk for poor academic performance comes in different forms. Cooney (2000) investigated 1,339 general studies majors at Salt Lake Community College to determine how different these students are in terms of educational and career goals. Any student who is undecided is included within the general studies major. Survey data examining the respondents revealed that of the 35% in the student body who were general studies majors, 76% were
classified as undecided. Results also revealed that although educational and career goals appeared similar, those students who were undecided in their major were most in need of assistance from faculty and student services. Additionally, they found indecision when choosing a field of study can ultimately have a negative impact on student success.

St. John, Hu, Simmons, Carter, and Weber (2004) found similar results. Taken from the Indiana Commission for Higher Education’s Student Information System, data for 3,123 Caucasian and 5,755 African American students from Indiana state institutions were examined to determine factors related to persistence throughout freshman and sophomore years. Among the factors examined were background data (e.g., age, ethnicity, etc.), college experience (e.g., grades, type of institution, etc.), major (e.g., undecided, social sciences, etc.), and financial aid statistics. Results revealed freshman Caucasian students who were undecided had a lower probability of persisting than other Caucasian students. According to Hu et al., these results are not surprising considering work by Tinto (1993) would indicate the “lower level of probability of persistence by White freshmen who were undecided about their major field may result from either their initial lower level of goal or institutional commitment or from their lower level of academic and social integration” (p. 226).

Similarly, Ridener (1999) investigated 204 students enrolled in an introductory sociology course to determine how ecological worldviews might change when exposed to an environmental education program. Students were divided into four groups of majors (i.e., social science, science, business, and undecided) to determine which students might respond more or less favorably to the program. Results revealed both social science and science majors showed the most increases in ecological attitudes from pretest to posttest
measurements, while business and undecided majors showed the least change. These results suggest undecided students, in addition to business majors, fail to comprehend the importance of environmental responsibility as well as social science and science majors. Although they may not necessarily know any less, undecided and business majors demonstrate less concern, which may be an indication of their approach to other educational endeavors or world views.

Despite the aforementioned research indicating undecided students do not perform as well as those with a major, there is evidence to the contrary. Kroc, Howard, Hull, and Woodard (1997) investigated 204,000 students from 38 public, land grant institutions in 1988 and 1990 to determine if academic program choice had a relationship to graduation rates. Among the many results of this large study was the finding that undecided students (about 26% of the study population) were retained through to graduation at a higher rate than students who chose a major upon entry to the university (56.9% to 54.8% respectively). Findings also revealed undecided students had similar entry characteristics and high school preparation as those who initially chose majors. “This finding is significant given the mythology about undecided students. Clearly undecided students are not poorly prepared upon entry, do not drop out at higher rates, and do not take longer to graduate” (p. 5).

Knight (1994) conducted a similar study at Georgia Southern University. In an effort to explain the time it takes some students to achieve graduation, the entire graduating class of 1992 (868 students) was examined. Although not as comprehensive as the Kroc et al. (1997) study, Knight’s findings revealed similar results. That is, academic major did not impact time to graduate. Although Knight did not specifically investigate
undecided majors, the fact all majors were not related to time to graduation gives credence that other variables besides major choice contribute more significantly to graduation.

Both Knight (1994) and Kroc et al. (1997) demonstrated choice of major, or lack of choice, do not impact graduation. This idea was strengthened by Schein and Laff (1997) when they wrote “the construct of a major is a somewhat artificial notion . . . majors, in many cases, are bureaucratic and administrative structures that put arbitrary boundaries on disciplines and restrict creative ways of conceptualizing academic pathways” (p. 42). Instead, they argued a major should be a joint decision between student, department, and advisor whereby the student has more choice in their educational path. From this standpoint, being undecided would not distinguish one student from another, and would not place them in an artificially created group having little bearing on their graduation outcome.

It is evident the literature is not consistent regarding the impact of being undecided. Evidence from Cooney (2000), St. John et al. (2004), and Ridener (1999) suggested undecided students are more at risk for educational roadblocks. However, Kroc et al. (1997) and Knight (1994), and found undecided students do not show differences in their progress toward graduation, while Schein and Laff (1997) argued that defining students by a major is an arbitrary way to categorize students. Given this inconsistent evidence, the current study attempted to determine if being undecided is related to first-year GPA and retention of student-athletes.
Athletic Variables

Beyond demographic and academic variables often associated with predicting college academic performance, there is a group of potential predictor variables unique to student-athletes. Such variables could play a critical role in the lives of student-athletes because they define much of the athletic experience. These variables include the type of sport, coaching influence, playing time, and team winning percentage. Each of these variables has the potential to dramatically impact how a student-athlete perceives their college athletic experience, and may be powerful enough to impact academic performance and retention. The current study is designed to examine if such relationships exist.

Sport

The differences in academic achievement between individual collegiate team sports are well documented. The revenue sports of men’s football and basketball have fallen under attack for their historically sub-par academic performances (Mayo, 1982; Riemer et al., 2000), while many women’s teams have performed at extremely high levels (Hosick, 2009). The NCAA pays particular attention to these differences and monitors several indicators of academic success in the form of the APR and graduation rates.

As previously noted, the APR is meant to be an accurate predictor of academic performance for individual teams (Christianson, 2004). The results for the latest four-year APR data reported by the NCAA for the 19 men’s teams confirm the long-standing concerns held for the revenue sports of basketball and football (Christianson, 2009; Eitzen & Purdy, 1986; Kane et al., 2008; Kihl et al., 2008; Lang et al., 1988; Mayo, 1982;
Riemer et al., 2000; Shapiro, 1984; Young & Sowa, 1992). The criticism is warranted given the two lowest APR scores for men’s teams are football (939) and basketball (933) (NCAA Research Staff, 2009). This trend has been consistent throughout APR data collection.

Beyond basketball and football, the next five lowest men's APR averages for Division I institutions were seen in baseball (946), wrestling (948), indoor track (953), outdoor track (954), and soccer (958). These numbers represent a four-year average in all teams across the country. Therefore, it is reasonable to conclude these are the sports, alongside basketball and football, that warrant the greatest concern from both a GPA and retention perspective. (Hosick, 2009; NCAA Research Staff, 2009).

For women’s sports, the average APR scores are higher than men. The five lowest team scores for women were in bowling (945), basketball (962), indoor track (965), outdoor track (966), and softball (968). It is clear the lowest women’s scores are well above the lowest men’s scores. In fact, with the exception of women’s bowling, all of the women’s average APR scores were higher than the lowest seven men’s scores. It is interesting to note within the bottom six men’s teams and the bottom five women’s teams are the sports of basketball, indoor track, and outdoor track. Furthermore, baseball and softball both have averages in the bottom five (NCAA Research Staff, 2009). This evidence suggests the student-athletes who participate in these specific sports struggle academically more so than student-athletes in other sports. This observation is important because it suggests a link between the type of sport and academic achievement. However, it is also important to note that although these sports demonstrate the lowest average scores, there are large differences in these averages between genders. This finding
suggests gender and sport are interacting to produce these results, thus strengthening the need to investigate these variables in combination with each other.

When comparing the APR national four-year averages to sports at Ball State University, the numbers are similar. In men’s sports the three lowest four-year APR averages were for basketball (873), baseball (939), and football (944). These results are similar to national averages for men’s teams. For women, the three lowest averages at Ball State were softball (962), tennis (961) and volleyball (974). These results are similar to national averages with softball and tennis scoring below the national averages by 6 and 13 points respectively, and volleyball scoring 2 points above the national average (Academic Progress Rate, 2009; NCAA Research Staff, 2009). This evidence suggests Ball State University APR scores are similar to the national APR averages, thus increasing the potential for generalizability of the current study to the broader student-athlete culture.

In addition to APR scores, graduation rates have been a longstanding marker of academic achievement and retention for individual sports. Currently, there are two ways to calculate graduation rates. The original rate, known as the federal graduation rate, does not take into account students who transferred out or in to a university, or who started their college careers in the middle of an academic year. The modified rate, known as the graduation success rate (GSR), takes these changes into account and is used by the NCAA because it is a more accurate measure of graduation (NCAA Research Staff, 2008).

The NCAA first began collecting GSR data with the entering freshman class of 1995. The latest data for the Division I entering class of 2001 reveals the lowest GSRs
are in the men’s sports of football (championship subdivision, 62.6%), basketball (65%), football (bowl subdivision, 66.3%), wrestling (71.2%) and baseball (72.4%). In women’s sports, the lowest GSRs were from the sports of bowling (78.6%), track (85.3%), basketball (85.4%), and golf (86.5%).

At Ball State University, the GSR and federal graduation rates for the 1998-2001 cohorts resemble the national averages. In men’s sports the lowest GSRs are in golf (60%), track (64%), basketball (67%), and football (72%) (Graduation Success Rate, 2008). It is important to note that golf is an aberration because of the small size of the team and the potential impact on GSR if one or two individuals do not graduate. Furthermore, it is important to note the Ball State men’s track program was eliminated in 2004.

Female GSRs were slightly different than national averages with the lowest scores in tennis (55%), soccer (71%), golf (73%), and field hockey (74%). Basketball and track, two women’s sports with low national GSRs, were both higher than the national averages. Basketball had a GSR of 95% and track was at 81%. These comparisons suggest men’s sports at Ball State closely mirror the national GSR averages. Conversely, women’s GSRs seem to be somewhat inverted with nationally strong graduating sports (i.e., tennis, soccer, field hockey) faring less well at Ball State than sports which have lower national averages (i.e., basketball and track).

Research examining individual sports has found the same general conclusions offered by the APR and graduation rates. The sports of football and basketball consistently produce lower academic achievement than all other sports (Adler & Adler, 1985; Akker, 1995; Lang et al., 1988; Purdy et al., 1982; Riemer et al., 2000; Walter et
al., 1987). Additionally, women’s sports are consistently higher in nearly every academic measure than men’s teams (Meyer, 1990; Riemer et al., 2000). This research supports the argument by Adler and Adler (1985) which suggests the more status given to a specific team by the university community, the more time and energy would be spent on their sport program. Thus, less time would be focused on academics.

Not surprisingly, sports that demonstrate low measures of academic achievement and low graduation rates are the same sports that demonstrate low APR scores. The consistently low marks for these teams suggest certain sports may attract student-athletes who do not excel academically and matriculate towards graduation. This type of evidence may serve to reinforce the dumb jock stereotype, especially for the highly-publicized revenue sports of basketball and football. This evidence also justifies the examination of sport type as a potential predictor of academic success.

**Coaching Change**

*In loco parentis* is a Latin term translated to mean “in place of a parent.” This term is utilized in a variety of settings within higher education, but there is likely no greater example of this term than a college athletic coach. A college coach plays a primary role in the social, psychological, and developmental growth of student-athletes while directly influencing most aspects of a student’s life (Field, 1991). In one college coach’s words;

I think each one of us as coaches, are also sport psychologists because different guys have different buttons and they respond to different things.

. . . You’re their father figure, you’re the minister, you’re the advisor, and sometimes the warden. You know, you’re all those things. You’re their
friend if you have the right kind of relationship. (Giacobbi, Roper, Whitney, & Butryn, 2002, p. 173)

These comments place a perspective on the important role coaches have in the lives of college student-athletes. The roles, however, do not develop without reason. Beginning with the recruiting process, college coaches lay the foundation for the type of student-athletes they believe will fit within their particular program, and the expectations for student-athlete’s behavior within their program. During recruiting trips it is not uncommon for coaches to visit the homes of respective student-athletes to talk with the student and their family. It is during these recruiting meetings that prospective student-athletes are first informed about the athletic, social, and academic expectations associated with their college career (Baldwin, 1999).

Oftentimes, the coach’s recruiting trip is the first association a prospective student-athlete has with a university. The relationship with a coach sometimes becomes the filter from which a student comes to view their potential life at a particular university. If rapport is built with the coach, the student may choose to visit the university, meet their future teammates, and investigate a potential academic program of interest (Baldwin, 1999; Looney, 1989).

After a student-athlete agrees to attend a specific university, they are under the direction of the college coach. Although there are a number of different philosophies from which coaches choose to guide their programs, each coach has a great deal of influence over the members of their team (Parsh, 2007). The amount of influence is dependent on the roles each coach chooses to fulfill, and how much authority they wish to exercise over their particular teams.
As evidenced in the earlier quote by Giacobbi et al. (2002), coaches are responsible for fulfilling a variety of roles and exercising a great deal of authority. First and foremost the coach is expected to be the expert and mentor in their particular sport. They are responsible for all things related to the program including practice plans, game plans, coaching staffs, budget allocation, scheduling, public relations, team policy, and punishment (Smith, 2004). As a result of these wide-ranging athletic responsibilities, coaches have a great deal of interaction with their student-athletes.

Beyond the athletic expert, a college coach may play a number of critical roles in the lives of student-athletes. They might resemble teachers (Brubaker, 2007), guardians (Schilling, 2007), business mentors (Lattman, 2008), counselors (Bradley, 2005), disciplinarians (Schilling, 2007), injury evaluators (Lewis, 2004), emotional caretakers (Gagne, Ryan, & Bargmann, 2003), and psychologists (Amorose, 2003; Thelwell, Weston, Greenlees, & Hutchings, 2008). These roles cover nearly any scenario for which a coach might intervene in the lives of student-athletes, and demonstrates how influential a college coach can become in the absence of parents. One critical area that can be shaped by coaching roles is academic expectations. Coaches may outline specific team goals in addition to individual expectations. These expectations might include specific GPAs, class attendance policies, study table expectations, and regular meetings with the coaching staff. Depending on the coach, these expectations will vary from team to team. Some coaches may employ strict academic guidelines, while others may implement a more leisurely approach.

It is reasonable to assume student-athletes are impacted by these academic expectations. Therefore, any change in such a powerful leadership position could be
assumed to bring a change in the academic philosophy and behavior of the student-athletes on a particular team. Due to the large amount of coaching turnover at a mid-sized Division I university, the current study afforded the opportunity to investigate the potential impact of a coaching change on the GPA and retention of student-athletes.

Playing Time

College athletes, particularly at the Division I level, were typically the most skilled athletes at their high schools. They rarely had to worry about playing time and competing for a position because their skills were far superior to the average high school athlete. Using a popular analogy, they were big fish in a small pond. The result of this advance athletic skill provided the opportunity to play college sports. This scenario changes for many high school athletes as they transition to the college game. Former high school stars may find themselves surrounded by athletes with equal or better athletic skills. The result may be less playing time than they were accustomed to in high school. Therefore, many new college athletes may become small fish in a big pond (Murphy, 1991).

This change in playing time may impact the athletic identity of student-athletes. Students who were once the best athletes on their high school teams may get less playing time in college, thus changing how they feel about their abilities and their role as a sport participant. Student-athletes who were all-state performers in high school may not earn a varsity letter in college because such awards may be determined by playing time (Moe, 1994).

Furthermore, lack of playing time has been the basis for numerous legal disputes where “there may be a viable cause of action against a coach and school for limiting a
student-athlete’s playing time if it can be established that the student-athlete had a valuable athletic reputation” (Epstein, 2005, p. 174). Although most such lawsuits are considered frivolous, the fact such lawsuits continue to be filed demonstrate the strong feelings tied to playing time, especially for those with strong athletic identities and potential proprietary interests.

Because playing time appears to be heavily tied to an athletic identity, research suggests playing time does have an impact on student-athletes in a variety of ways. In one of the earliest studies to examine playing time, Kauss (1978) investigated the entire UCLA football team (N=100) and coaching staff (N=9) to determine how different playing variables impacted psychological and physical readiness. More specifically, Kauss wanted to know how experience, playing time, offense versus defense, position, and professional aspirations impacted the players and coaches perceptions of emotional, physical, cognitive, and professional preparation. Results suggested both players and coaches believe starters and experienced players were more prepared emotionally and physically, thus resulting in more playing time. Therefore, Kauss was able to determine that a player who received more playing time tended to “get less excited, angry, etc. and to control his energy in more structured, instrumental, productive ways” (p. 142).

Kauss’ (1978) results implied college athletes who displayed more control of their physical and emotional states tended to earn more playing time. These results were important because they identified playing time as a variable that may impact the psychological and emotional states of student-athletes. Petlichkoff (1993a, 1993b) extended Kauss’ ideas and realized there were differences in how playing time could be defined. Petlichkoff conceptualized playing time on a continuum of high to low rather
than a dichotomous definition that placed student-athletes in a participant or nonparticipant category. Petlichkoff also noted playing time could dramatically change throughout a sport season. Therefore, Petlichkoff hypothesized as participation increased or decreased throughout a sport season, so too might an individual’s motivation and satisfaction levels.

Petlichkoff’s findings confirmed those who played more throughout a sport season had higher perceptions of their athletic ability, higher levels of mastery goal orientations (i.e., a focus on personal skill improvement), and higher levels of satisfaction. These findings were consistent throughout the entire sport season. Such results demonstrate the strong relationship between the amount of playing time and perceived competence, which has been consistently shown to be a correlate of motivation and enjoyment in physical activity (Weiss, McAuley, Ebbeck, & Wiese, 1990).

Weiss and Frazer (1995) extended this line of thinking when they examined 141 female high school basketball players to determine if athletes with more playing time and status would be motivated for different reasons than would secondary substitutes. Participants were evaluated to determine perceptions of success, competence, and enjoyment at three different points in a basketball season (preseason, midseason, and postseason). Weiss and Frazer hypothesized; 1) “athletes with more playing time and status would be motivated for different reasons than would secondary substitutes, and would perceive success, competence, and enjoyment differently from the latter” (p. 325), and 2) starters would score higher in perceived basketball competence than would primary and secondary substitutes by the end of the season. Results indicated the first hypothesis was incorrect. Starters, primary substitutes, and secondary substitutes were
consistent in describing mastery goals, friends, team aspects and fitness as important motives for their participation throughout the whole season. This consistency suggests “motives for participating in sport are common among teenagers, regardless of playing time or status, at various points during their involvement” (p. 325). Results from the second hypothesis, however, were confirmed. Starters were higher in their perceived sport confidence than were the primary and secondary substitutes at the end of the season. Additionally, both starters and primary substitutes were high in perceived peer acceptance, perceived success, and enjoyment at both midseason and the end of the season. These results demonstrate “athletes who were given more opportunities to demonstrate their ability and master skills perceived themselves as more successful over the season, more competent in basketball skills, more accepted by their teammates, and experienced more enjoyment playing basketball” (p. 325). Similar results were found by Demaine and Short (2007) when they concluded playing time is one variable that accounts for increased sport confidence. Furthermore, Rainey and Schweickert (1991) found that collegiate baseball players who were satisfied with their playing time were more committed to team goals and objectives.

Given the results from Kauss (1978), Petlichkoff (1993a, 1993b), Weiss and Frazer (1995), Demaine and Short (2007), and Rainey and Schweickert (1991), it is prudent to conclude playing time is related to various self perceptions, motivation, confidence, and enjoyment of particular athletic environments. But, how do these results impact the lives of student-athletes outside of their sporting context? In other words, given the apparent psychological and social impact of playing time on a student-athletes’ sporting experience, could playing time also influence a student’s academic performance
or retention? It seems reasonable to conclude that because student-athletes do not function in a sporting vacuum, and because of the strong athletic identity displayed by many collegiate athletes, playing time could impact a student-athlete in a variety of ways, including academic performance or retention. There is virtually no research available that has answered such a question for collegiate student-athletes, but there are some clues found in other research.

For example, Dellaserra (1988) investigated a link between playing time and academic performance of high school student-athletes. Thirty-six California high school female basketball players were separated into two groups based on playing time during an entire season. The regular players were defined as ones that played in more than half the total minutes throughout the season, and the non-regular players participates in less than half the total minutes for the entire season. These groups were then compared based on a number of GPA measures (i.e., overall, in-season, elective courses, subject areas). Results from Dellaserra’s study indicated playing time had no significant impact on the academic performance of female high school basketball players. These results suggest female basketball players at the high school level do not allow playing time to influence their academic performance. Although it appears these student-athletes can separate athletic participation from academic responsibilities, Dellaserra’s results may need further exploration. Given the small sample size (n=36), as well as the population (female high school students), one may question if these results transfer to the average division I college athlete, especially student-athletes with a highly developed athletic identity.

Childs (2002) found high school student-athletes do not identify with sports as strongly as college student-athletes. That is, college athletes tend to have a stronger
athletic identity. Furthermore, Childs found college athletes who planned to continue their athletic careers beyond college had a stronger athletic identity than those who did not. Likewise, Wang, Chen, and Ji (2004) discovered college student-athletes (starters and nonstarters) perceived playing time as a critical issue during their college experience. These results suggest that although Dellaserra (1988) found no link between playing time and academic achievement at the high school level, such a link may be found at the college level due to the more evolved sense of athletic identity in college student-athletes. This study attempted to determine if such a link exists.

Team Winning Percentage

As previously explained, members of different sport teams appear to perform differently with respect to academic achievement and retention. But, are academic performance and retention affected based on the winning percentage of a team? In other words, does a winning or losing season impact the GPA and retention of student-athletes, or are most student-athletes able to keep their academic lives separate from their athletic team achievements? This question is difficult to answer because most research has focused on investigating differences between sports as a whole, rather than examining how students respond to the wins and losses during a particular season.

In research investigating individual sports, traditional revenue producing sports perform worse in nearly all academic measures, and are retained at a lower level than non revenue sports (Amato, Gandar, Tucker, & Zuber, 1996; Christianson, 2004; Hosick, 2009; Institute for Diversity and Ethics in Sport, 2008; NCAA Research Staff, 2008; Shapiro, 1984). These differences are magnified when one examines the most athletically successful of these teams. For example, of all the 2008 football bowl participants, 19
(28%) teams graduated less than half of their African American student-athletes (Institute for Diversity and Ethics in Sport, 2008). Additionally, in the 2009 NCAA Division I men’s basketball tournament only 40 teams (63%) graduated more than half of their student-athletes, only 22 teams (35%) demonstrated graduation rates above 70%, and a 38% gap existed between the graduation rates of Caucasian and African American players (Institute for Diversity and Ethics in Sport, 2009a).

This evidence suggests an inverse relationship between winning and academic success for the most athletically successful revenue sports. That is, the winningest football and basketball teams seem to perform at relatively low academic levels, particularly for African American student-athletes. It is this relationship between successful revenue-producing athletic teams and poor academic performance that has fueled the dumb jock stereotype, and continues to reinforce the idea that student-athletes cannot be simultaneously successful in athletics and academics (Simons et al., 2007).

In contrast to schools with large football and basketball programs, evidence from one small college with no football program suggests student-athletes are not different than the normal student population in terms of GPA (Akker, 1995). These results are interesting because they conflict with the notion student-athletes perform differently than non-athletes. However, when evaluating such a study it is important to note football was not included in this sample, and this institution is a small and relatively selective college.

Likewise, Kotlyarenko and Ehrenberg (2000) investigated the relationship between academic index and athletic success for schools in the Ivy League. Even though Ivy League schools are known as the most prestigious and rigorous academic institutions with NCAA Division I athletic status, the authors hypothesized higher athletic
achievement would be correlated with low academic measures. Contrary to the hypothesis, the results revealed high athletic achievement was synonymous with high academic achievement. These results, like those from Akker (1995), suggest students who perform well academically, also perform well athletically.

Given the inconsistent evidence relating sport success and academic achievement, it is difficult to determine how much (if any) winning may impact individual student-athletes. Although there have been no studies examining the relationship between team winning percentage and academic performance, there is evidence such a relationship might exist. First, successful sports teams appear to be important to students and university stakeholders with regard to a shared sense of pride and community. The most compelling evidence demonstrating the importance of successful athletic teams comes from what has been described as the Flutie effect. This phenomenon suggests the more successful a university becomes in athletics (especially in the highly visible sports of football and basketball), the more publicity and positive recognition it receives, thus producing an increase in freshman applications. This phenomenon is named the Flutie effect because a year after 1984 Heisman winner Doug Flutie led Boston College to national football fame, the applications for admissions at Boston College jumped from 12,500 to 16,200 (McCormick & Tinsley, 1987).

Such a phenomenon is not isolated to Boston College. North Carolina State University received a 40% increase in applications after their 1983 NCAA basketball championship, and the University of South Carolina reported a 23% increase in 1985 following the best year of football in the school’s history. Similarly, Stinson and Howard (2008) reported successful athletic programs directly impact both the number of donors
making gifts to an institution, as well as the average dollar amount of those gifts. Furthermore, winning football and basketball programs have direct effects on both athletic and academic gifts, which suggest successful and popular athletic programs benefit the university with increased financial support.

The Flutie effect, as well as increased financial giving, indicates successful athletic programs can reach beyond an athletic department to generate positive influences on athletes. These winning programs can be a source of intense pride, and lead to increased applications and contributions from students, fans, and stakeholders. McCormick & Tinsley (1987) noted; “We conclude that there is evidence to a symbiotic relation between athletics and academics on many college campuses, and the elimination of large-scale athletic participation could, for any particular school, have detrimental effects on its enrollment and academic standards” (p. 1108). Such a symbiotic and powerful relationship acknowledged by students and stakeholders surely must be felt by the student-athletes themselves. If that is the case, it is also reasonable to conclude winning impacts multiple areas of college student-athletes' lives, including their approach to academic requirements and prolonged enrollment.

The second piece of evidence suggesting winning percentage might influence academic performance and retention comes from the student-athlete experience. Given the high athletic identity seen in Division I student-athletes (Taylor & Ogilvie, 2001), as well as the considerable time and effort expected from these students (Simons et. al, 2007), it is reasonable to conclude student-athletes have a vested interest in the success of their team. With such an intense focus on athletic responsibilities, it is logical to conclude team athletic performance may affect attitudes towards other responsibilities.
Hurley (1993) noted student-athletes who were on full athletic scholarships had significantly lower GPAs than those who did not have a full scholarship. In other words, student-athletes who had the most invested in the sporting experience did not perform their academic responsibilities as well as those student-athletes who were not tied to their sports by a fully funded education. Similarly, Bentson and Summerskill (1955) found college letter winners enjoyed their college experiences more than non-letter winners. These findings demonstrate the importance athletics has for many student-athletes, and allows one to conclude if scholarships and varsity letters impact the lives of student-athletes, then team winning percentage might have an impact as well.

Summary

The preceding review summarized the literature pertaining to the current research study which attempted to predict GPA and retention of first-year student-athletes. This review contained five distinct parts, each designed to provide information from which the current research was developed. First, a brief glimpse into the lives of student-athletes and college athletics provided a context from which to view this research. Second, the APR was discussed providing a rationale for examining GPA and retention. Third, this review identified the literature pertaining to the demographic variables utilized in this study. Fourth, the academic variables used in the current study were discussed. Finally, the literature regarding the athletic variables identified in the current study were reviewed.
CHAPTER III

METHODS

Project Summary

The current research attempted to predict first-year grade point average (GPA) and retention using demographic, academic, and athletic variables. GPA and retention were chosen as dependent variables because they are the primary components used to calculate the Academic Progress Rate (APR), a measurement used by the National Collegiate Athletic Association (NCAA) to evaluate real-time academic performance of individual teams. Gaining an understanding of how these predictor variables impact GPA and retention may help provide effective academic support programming for student-athletes.

This research is presented in a five-chapter format. Chapter three is a description of the methods. The following chapter includes specific information about the design of the study, setting, data collection procedures, statistical design and analysis, and a plan for data presentation.

Design of the Study

Because low APR scores can have serious consequences for college athletic teams (Brown, 2005), it is reasonable to examine which variables most accurately predict those scores. Although there have been numerous studies conducted on the academic performance of student-athletes (see Chapter 2), there is little data to determine which
combination of variables might provide the most powerful predictions of GPA and retention, and there is virtually no evidence linking athletic variables to these measures, or the APR. Therefore, the problem investigated in this study is a lack of understanding regarding what types of variables would most accurately predict the determinates of the APR, namely GPA and retention.

Statement of Purpose and Research Questions

The purpose of this study was to predict student-athletes’ first-year college GPA and persistence into their second year of college using demographic, academic, and athletic predictor variables. This goal was achieved by answering the following two research questions. First, what variables predict GPA for student-athletes during the first year of college? Second, what variables predict retention of student-athletes into the second year of college? Answering these questions provided insight into a combination of variables that had not been explored in conjunction with APR scores, thus ensuring the significance of this study.

Hypotheses

This study tested two hypotheses. First, all variables examined were significant predictors of first-year college GPA. Second, all variables examined were significant predictors of retention into the second year of college.

Population and Sample

The population investigated in this study was all first-year student-athletes at Ball State University. The sample included 674 first-year student-athletes from the years of 2004-2008. These years were chosen because the ability to produce an accurate list of players from Academic Support Services records began in 2004. Before 2004, accurate
records of student rosters from Academic Support Services did not exist. Participants were evaluated using the following 13 possible independent predictive variables; gender, race, distance from home, high school GPA, high school rank, standardized test scores, first-semester college GPA, major, size of high school, sport, coaching change, playing time, and team winning percentage.

Research Approach

Because this study examined a relationship between variables, the researcher was a detached observer, and the goal was to establish generalizations about the population, a quantitative approach was appropriate. Within the quantitative approach, the researcher utilized both descriptive and inferential statistics. Descriptive statistics (i.e., mean, median, standard deviation) were used to describe the results in general terms (Green, Camilli, & Elmore, 2006). Inferential statistics (i.e., correlation and multiple regression) were used to evaluate the relationships between the independent predictor variables and the dependent variables of first-year GPA and retention (Montgomery, Peck, & Vining, 2006). Identifying such a correlation allowed the researcher to make inferences about the relationships. Because the data had already been recorded by the institution, the researcher considered the data archival, and extracted it from the appropriate sources (Fraenkel & Wallen, 2006).

Setting

The current study takes place at Ball State University. The campus, located in Muncie, Indiana, is a state-assisted residential university one hour northeast of Indianapolis. Ball State is ranked as a doctoral/research university by the Carnegie Foundation and has approximately 20,000 undergraduate and graduate students (Ball
State, 2009b). There are 175 bachelor’s, 92 master’s, 16 doctoral, eight associate, and
two specialist degrees offered through seven academic colleges (Ball State, 2009a). Ball
State is a member of the NCAA and competes in seven men’s and twelve women’s sports
at the Division I level (Ball State, 2009c).

The researcher, who is the Assistant Coordinator of Academic Support Services
for Student-Athletes, has witnessed the effects athletic participation appears to have on
the academic progress of student-athletes, as well as the impact the APR has on
identifying academic programming efforts for student-athletes. Identifying athletic
variables, in conjunction with demographic and academic variables, allowed the
researcher to identify the best set of variables from which to predict first-year GPA and
retention. This potential link between student-athletes’ athletic and academic worlds is
critical to understanding the overall academic performance of student-athletes.

Data Collection Procedures

Upon approval from the Institutional Review Board (see Appendix B), the
researcher compiled a complete list of freshman student-athletes (years 2004-2008) from
the files provided by the Office of Academic Support Services for Student-Athletes.
Academic Support Services serves as the liaison between the athletics department and
academic departments at Ball State University.

The student-athlete list included any new student-athlete identified by each varsity
c coach as a first-year member of their team during a pre-semester meeting with Academic
Support Services staff. These meetings, usually held the week before fall classes begin,
allows the coach to provide the names of all scholarship and walk-on student-athletes
they are allowing on their team for the start of the academic year. This list is a more
accurate representation of new student-athletes than a compliance roster because several student-athletes often discontinue participation in their respective sports during the first few weeks of the fall semester, before an official compliance roster may be created.

Permission to utilize information from Academic Support Services, as well as a statement of support regarding the research methods, was provided by the Coordinator of this department (see Appendix C).

After the list of student-athletes was created, information was extracted from the Ball State University IBM Hummingbird system. This system is the central informational database for Ball State University. All of the demographic (i.e., gender, race, hometown) and academic variables (i.e., high school GPA, high school rank, standardized test scores, first-semester GPA, major, size of high school) was obtained from this system. Athletic variables (i.e., coaching change, playing time, winning percentage) were obtained from media guides, or the Ball State University athletics website, maintained by the Ball State University Athletics Media Relations department. The data included all of the relevant student-athlete information for each incoming class of student-athletes during the five years investigated in this study (2004-2008). All information was stored in a password-protected Microsoft Excel file on the researcher’s office desktop computer.

Names and identification numbers of the participants were included in the Excel file for identification purposes only during data collection. The inclusion of individual names and identification numbers were necessary because the researcher must know this information to have collected further data from the IBM Hummingbird system. After the data was inputted into the Excel file, and before any data analysis occurred, the names and identification numbers of all student-athletes were deleted from the data set. Only the
principle investigator and dissertation chairperson had access to the original Excel file and the specific names of student-athletes before they were deleted. Once the names were deleted from the Excel file, and only raw data existed, no one was able to identify individual student-athletes.

Furthermore, to ensure no individual participants were identifiable by the raw data, information was grouped by the variables under investigation, and analyzed as one data set for the entire five-year time period. No individual years were identified in the analysis or reporting of the data. Collapsing the data into one data set covering a five-year period ensured no student-athlete was identifiable by the year they entered school. Taking these measures to protect individual identities of student-athletes ensured no single individual was identifiable from the results of this research. Data sets were statistically analyzed only after the data was collected, collapsed into one data set, and names/identification numbers were deleted.

Statistical Design and Analysis

Upon completion of the data collection, the data was analyzed using Predictive Analytics SoftWare (formerly Statistical Package for the Social Sciences [SPSS]), version 18. Analysis included frequencies and measures of central tendency for descriptive purposes (e.g., means, median, standard deviation, ranges, etc.). In addition to these descriptive statistics, all independent predictor variables were subjected to multiple regression analysis against the dependent variables of first-year GPA and retention. Multiple regression is an advanced correlational technique “that enables researchers to determine a correlation between a criterion variable and the best combination of two or more predictor variables” (Fraenkel & Wallen, 2006, pp. 338-339).
Data Presentation

Data is presented within chapter four as text, and as numerical information within tables formatted according to the Publication Manual of the American Psychological Association (2001). The order of presentation follows the order of the research questions in this study. Therefore, descriptive statistics regarding the predictor variables and their correlation with first-year college GPA were first presented. Secondly, descriptive statistics regarding the predictor variables and their correlation with retention were presented. Finally, tables demonstrating the results of the Pearson correlations and multiple regression analyses for both dependent variables and independent variables were presented. Chapter five includes a discussion of the results.

Summary

The rationale of chapter three was to present information about the methods used to complete this research. Within this chapter a project summary and study design was first provided. Following the explanation offered by the summary and design, chapter three explained the population, research approach, setting, data collection procedures, statistical design, and data presentation.
CHAPTER IV
RESULTS

Project Summary

The current research was designed to predict first-year grade point average (GPA) and retention into the second year of college using demographic, academic, and athletic variables. GPA and retention were chosen as dependent variables because they are the primary components used to calculate the Academic Progress Rate (APR), a measurement used by the National Collegiate Athletic Association (NCAA) to evaluate real-time academic performance of individual teams. Gaining an understanding of how these predictor variables impact GPA and retention may help provide effective academic support programming for student-athletes. This research is presented in a five-chapter format. Chapter four describes the results.

Before describing the results, it is appropriate to explain the procedure used to ensure the data were accurate. Given the large amount of individual data points collected, it was essential to ascertain the accuracy of the data. The data reliability check was accomplished by randomly selecting 50 students (10 students in each of the five years of data) and recollecting their data. The recollected data was compared to the original data set for each case. The accuracy check revealed seven individual data inaccuracies from 750 possible data points (50 individual cases x 15 variables each). These results indicate the data collected was 99.1% accurate.
Population Characteristics

This study included 674 first-year student-athletes at Ball State University. Descriptive information for the dependent and independent variables are included in Tables one through four. Within these tables the $N$ values for each variable differs from variable to variable. The reason for this inconsistency is due to missing data for some student-athletes. Comprehensive data were not available for all student-athletes. For example, if a student-athlete decided to withdraw from the university during their first semester, they would not have an overall GPA at the end of the spring semester. Overall GPA would then be blank for that student-athlete, instead of a 0.0 GPA, thereby reducing the total amount of student-athletes who had an overall GPA. Another example would include high school rankings. Although 518 student-athletes in this study had a high school ranking, 156 of the participants’ high schools did not include such records on their transcripts, thereby causing missing data and reducing the total number of students who had a HS rank. Missing data is particularly important when calculating a multiple regression analysis because any students missing one or more variables were deleted from the multiple regression equation by virtue of a process known as listwise deletion (Montgomery et al., 2006). However, for descriptive purposes it is prudent to note the total number, means, and standard deviations for each variable.

Table 1 includes information describing the dependent variables of Overall GPA and Retention. There were 663 student-athletes who had mean overall GPA of 2.99 ($SD=.61$). The total number of students who were retained into their second academic
<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall GPA at End of First Year</td>
<td>663</td>
<td>2.99</td>
<td>.61</td>
</tr>
<tr>
<td>Retained Into Year Two</td>
<td>560</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Retained Into Year Two</td>
<td>114</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
year was 560. Conversely, a total of 114 student-athletes were not retained into their second year of college.

Table 2 demonstrates descriptive information for the demographic variables of gender, race, and distance from home. Because there were no averages necessary for these variables, Table 2 only includes total N values and percentages. Overall, there were slightly more males (52%) than females (48%), many more Caucasian (76%) than African American (18%) or other races (6%), and a relatively even distribution of the distance from home categories.

Table 3 includes descriptive information for the academic predictor variables of standardized test scores, high school GPA, high school class rank, high school size, first-semester college GPA, and major. The mean standardized test score (presented in ACT scoring format) was 21.62 (SD = 3.76) for the 655 student-athletes that had standardized test scores available. There were 654 student-athletes with a mean high school GPA of 3.06 (SD = .54). A total of 518 student-athletes had high school rank information. The high school rank information in Table 3 is presented as a percentage that represents where student-athletes rank in their class. For example, the mean number of 32.5% (SD = 2.13%) indicates the average first-year student-athlete at Ball State finished in the top 32.5% of their graduating class. There were 135 student-athletes who had a small high school graduating class (200 or less students). A larger group of student-athletes, 196, had a medium-sized high school graduating class (201-400 students). The largest category of high school graduating class size (more than 400 students) was attended by 187 student-athletes. The mean for the first-semester GPA was 2.99 (SD = .7), which
Table 2

*Descriptive Information for Demographic Predictor Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>352</td>
<td>52.2</td>
</tr>
<tr>
<td>Females</td>
<td>322</td>
<td>47.8</td>
</tr>
<tr>
<td>Caucasian</td>
<td>513</td>
<td>76.1</td>
</tr>
<tr>
<td>African American</td>
<td>120</td>
<td>17.8</td>
</tr>
<tr>
<td>Other Race</td>
<td>41</td>
<td>6.1</td>
</tr>
<tr>
<td>Distance (0-100 miles)</td>
<td>240</td>
<td>35.6</td>
</tr>
<tr>
<td>Distance (101-250 miles)</td>
<td>204</td>
<td>30.3</td>
</tr>
<tr>
<td>Distance (over 250 miles)</td>
<td>230</td>
<td>34.1</td>
</tr>
</tbody>
</table>
Table 3

*Descriptive Information for Academic Predictor Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized Test Scores</td>
<td>655</td>
<td></td>
<td>21.62</td>
<td>3.76</td>
</tr>
<tr>
<td>High School GPA</td>
<td>654</td>
<td></td>
<td>3.06</td>
<td>.54</td>
</tr>
<tr>
<td>High School Rank</td>
<td>518</td>
<td></td>
<td>32.5</td>
<td>2.13</td>
</tr>
<tr>
<td>High School Size (1-200 students)</td>
<td>135</td>
<td></td>
<td>26.1</td>
<td></td>
</tr>
<tr>
<td>High School Size (201-400 students)</td>
<td>196</td>
<td></td>
<td>37.8</td>
<td></td>
</tr>
<tr>
<td>High School Size (over 400 students)</td>
<td>187</td>
<td></td>
<td>36.1</td>
<td></td>
</tr>
<tr>
<td>First-semester GPA</td>
<td>668</td>
<td></td>
<td>2.99</td>
<td>.70</td>
</tr>
<tr>
<td>Has Major</td>
<td>553</td>
<td></td>
<td>82.1</td>
<td></td>
</tr>
<tr>
<td>No Major (undecided)</td>
<td>121</td>
<td></td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Standardized Test Scores are a combination of SAT and ACT scores converted ACT scores. High School Rank is presented as a % indicating the average student-athlete in this sample finished in the top 32.5% of their class. High School Size is the number of students in a participant's graduating class.
included 668 student-athletes. Finally, the number of first-year student-athletes who entered college with a declared major was 553. There were 121 student-athletes who did not identify a major upon entering college.

The descriptive information for athletic variables is provided in Table 4. For the category of sport, there were 204 student-athletes from revenue sports, and 470 student-athletes from non-revenue sports. Ninety-two student-athletes experienced a coaching change during their first year of college. The variable of playing time produced 354 student-athletes with low playing time, 87 students with medium playing time, and 233 with high playing time. Lastly, the athletic predictor variable of winning percentage included 674 student-athletes with a mean winning percentage of 47.2% (SD = 1.9%).

Relationships Between Variables

Because multiple regression is a statistical technique derived from a combination of correlations between multiple variables, it is necessary to first determine single correlations between individual variables. Calculating individual correlations provides a researcher the tool to evaluate individual variables within a multiple regression equation. In essence, correlations describe a one-to-one relationship, while multiple regression provides an overall description of how individual variables work in conjunction with one another to predict a dependent variable (Montgomery et al., 2006).

Table 5 provides the Pearson correlation coefficients between the dependent variables of overall GPA and retention, and the independent demographic predictor variables of gender, race, and distance from home. A p value of less than .05 was required for statistical significance. Race was divided into two categories based on a
Table 4

*Descriptive Information for Athletic Predictor Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport - Revenue</td>
<td>204</td>
<td>30.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport - Non-Revenue</td>
<td>470</td>
<td>69.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaching Change</td>
<td>92</td>
<td>13.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Coaching Change</td>
<td>582</td>
<td>86.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Playing Time</td>
<td>354</td>
<td>52.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Playing Time</td>
<td>87</td>
<td>12.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Playing Time</td>
<td>233</td>
<td>34.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Winning Percentage</td>
<td>674</td>
<td>47.2%</td>
<td>1.9%</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Sport - Revenue = football, men's basketball, and women's basketball. Coaching Change = athletes who have experienced a coaching change or not. Playing Time = amount of games or matches played (minutes played for basketball) divided into thirds.
Table 5

Pearson Correlation Coefficients Between Dependent Variables and Demographic Predictor Variables

<table>
<thead>
<tr>
<th></th>
<th>OGPA</th>
<th>Retained</th>
<th>Gender</th>
<th>Race 1</th>
<th>Race 2</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>OGPA</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Retained</td>
<td>-.26**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Gender</td>
<td>.36**</td>
<td>-.05</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Race 1</td>
<td>.36**</td>
<td>.16**</td>
<td>-.22**</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Race 2</td>
<td>.03</td>
<td>.02</td>
<td>-.03</td>
<td>-.12**</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Distance</td>
<td>.09*</td>
<td>.09*</td>
<td>.07*</td>
<td>.12**</td>
<td>.09*</td>
<td>—</td>
</tr>
</tbody>
</table>

Note. OGPA = overall grade point average. Retained = student-athletes retained into their second year of college. Race 1 = Caucasian compared to African American. Race 2 = Caucasian compared to other races besides African American. Distance = distance student-athletes attend college from their hometown.

*p < .05. **p < .01.
dummy code system which used Caucasians as a baseline. Race 1 refers to Caucasian
student-athletes compared with African Americans student-athletes. Race 2 refers to
Caucasian student-athletes compared with other races besides African Americans. All
demographic variables were significantly correlated with overall GPA, except for Race 2.
Similarly, all demographic variables except gender ($r = -.05$) and Race 2 were
significantly correlated with retention.

Table 6 provides the Pearson correlation coefficients for the academic predictor
variables of standardized test scores, high school GPA, high school class rank, high
school size, first-semester college GPA, and major. A $p$ value of less than .05 was
required for statistical significance. All academic variables were significantly correlated
with overall GPA. In fact, all academic variables were correlated at the $p < .01$
significance level. The variables of high school size ($r = .01$) and major ($r = -.03$) were
the only academic variables which did not correlate with retention.

Table 7 provides the Pearson correlation coefficients between the dependent
variables of overall GPA and retention, and the independent athletic predictor variables
of sport, coaching change, playing time, and winning percentage. A $p$ value of less than
.05 was required for statistical significance. The athletic variables of sport ($r = .37$) and
playing time ($r = .15$) were significantly related to overall GPA. The same two athletic
variables were also significantly related to retention ($r = -.09$ and -.17 respectively).

Predicting First-Year GPA

Table 8 demonstrates the results from an ordinary least squares multiple
regression analysis used to predict overall GPA after the first academic year in college.
Due to listwise deletion within the multiple regression statistic, 492 of the original 674
Table 6

*Pearson Correlation Coefficients Between Dependent Variables and Academic Predictor Variables*

<table>
<thead>
<tr>
<th></th>
<th>OGPA</th>
<th>Retained</th>
<th>Stand Tests</th>
<th>HS GPA</th>
<th>HS Rank</th>
<th>HS Size</th>
<th>1st GPA</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>OGPA</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Retained</td>
<td>-.26*</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Stand. Tests</td>
<td>.49**</td>
<td>-.11**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>HS GPA</td>
<td>.65**</td>
<td>-.14**</td>
<td>.52**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>HS Rank</td>
<td>-.58**</td>
<td>.12**</td>
<td>-.46**</td>
<td>-.83**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>HS Size</td>
<td>.15**</td>
<td>.01</td>
<td>.15**</td>
<td>&lt;-.01</td>
<td>-.07</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1st GPA</td>
<td>.89**</td>
<td>-.33**</td>
<td>.46**</td>
<td>.59*</td>
<td>-.52**</td>
<td>.09</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Major</td>
<td>-.11**</td>
<td>-.03</td>
<td>-.08</td>
<td>-.07</td>
<td>-.08</td>
<td>&lt;.01</td>
<td>-.09*</td>
<td>—</td>
</tr>
</tbody>
</table>

*Note.* OGPA = overall grade point average. Retained = student-athletes retained into their second year of college. Stand. Tests = standardized tests (i.e., a combination of SAT and ACT scores converted to ACT scores). HS GPA = high school grade point average. HS Rank = high school rank. HS Size = high school size (i.e., size of the participant's graduating class). 1st GPA = first-semester college grade point average. Major = has major or undecided.

*p < .05. **p < .01.*
Table 7

Pearson Correlation Coefficients Between Dependent Variables and Athletic Predictor Variables

<table>
<thead>
<tr>
<th></th>
<th>OGPA</th>
<th>Retained</th>
<th>Sport</th>
<th>Coach Change</th>
<th>Play Time</th>
<th>Win %</th>
</tr>
</thead>
<tbody>
<tr>
<td>OGPA</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Retained</td>
<td>-.26**</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sport</td>
<td>.37**</td>
<td>.09*</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Coach Change</td>
<td>-.02</td>
<td>-.03</td>
<td>.16**</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Playing Time</td>
<td>.15**</td>
<td>-.17**</td>
<td>.28**</td>
<td>-.01</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Win %</td>
<td>.01</td>
<td>&lt;.01</td>
<td>.01</td>
<td>-.25**</td>
<td>-.10*</td>
<td>—</td>
</tr>
</tbody>
</table>

Note. OGPA = overall grade point average. Retained = student-athletes retained into their second year of college. Sport = revenue sports or non-revenue sports. Coach Change = athletes who have experienced a coaching change or not. Playing Time = amount of games or matches played (minutes played for basketball) divided into thirds. Win % = team winning percentage.

*p < .05. **p < .01.
Table 8

Summary of Ordinary Least Squares Multiple Regression for Variables Predicting
Overall GPA (N= 493)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.06</td>
<td>.03</td>
<td>.05</td>
<td>1.91</td>
<td>.06</td>
</tr>
<tr>
<td>Race 1</td>
<td>-.13</td>
<td>.04</td>
<td>-.08</td>
<td>-3.52</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Race 2</td>
<td>-.04</td>
<td>.06</td>
<td>-.01</td>
<td>-.63</td>
<td>.53</td>
</tr>
<tr>
<td>Distance</td>
<td>.03</td>
<td>.02</td>
<td>.04</td>
<td>2.14</td>
<td>.03*</td>
</tr>
<tr>
<td>Academic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand. Tests</td>
<td>.01</td>
<td>&lt;.01</td>
<td>.04</td>
<td>1.38</td>
<td>.17</td>
</tr>
<tr>
<td>HS GPA</td>
<td>.09</td>
<td>.05</td>
<td>.08</td>
<td>1.97</td>
<td>.05*</td>
</tr>
<tr>
<td>HS Rank</td>
<td>&lt;-.01</td>
<td>&lt;.01</td>
<td>-.08</td>
<td>-2.20</td>
<td>.03*</td>
</tr>
<tr>
<td>HS Size</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.04</td>
<td>1.83</td>
<td>.07</td>
</tr>
<tr>
<td>1st GPA</td>
<td>.71</td>
<td>.02</td>
<td>.74</td>
<td>29.22</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Major</td>
<td>-.04</td>
<td>.03</td>
<td>-.03</td>
<td>-1.41</td>
<td>.16</td>
</tr>
</tbody>
</table>
### Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>-.03</td>
<td>.04</td>
<td>-.02</td>
<td>-.75</td>
<td>.46</td>
</tr>
<tr>
<td>Coach Change</td>
<td>-.05</td>
<td>.04</td>
<td>-.03</td>
<td>-1.29</td>
<td>.20</td>
</tr>
<tr>
<td>Playing Time</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>.60</td>
<td>.55</td>
</tr>
<tr>
<td>Win %</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.01</td>
<td>.24</td>
<td>.81</td>
</tr>
</tbody>
</table>

*Note. Race 1 = Caucasian compared to African American. Race 2 = Caucasian compared to other races besides African American. Distance = distance student-athletes attend college from their hometown. Stand. Tests = standardized tests (i.e., a combination of SAT and ACT scores converted to ACT scores). HS GPA = high school grade point average. HS Rank = high school rank. HS Size = high school size (i.e., size of the participant's graduating class). 1st GPA = first-semester college grade point average. Major = has major or undecided. Sport = revenue sports or non-revenue sports. Coach Change = athletes who have experienced a coaching change or not. Playing Time = amount of games or matches played (minutes played for basketball) divided into thirds. Win % = team winning percentage. *p < .05. **p < .01.
participants were included in this calculation. One hundred eighty two participants were missing one or more variables, and were subsequently eliminated using the listwise deletion technique. For all multiple regression calculations race was divided into two categories based on a dummy code system which used Caucasians as a baseline. Race 1 refers to Caucasian student-athletes compared with African Americans student-athletes. Race 2 refers to Caucasian student-athletes compared with races other than African Americans.

Within the demographic variables, Race 1 \( (p < .01) \) and distance from home \( (p = .03) \) were significant contributors to the prediction model. High school GPA \( (p = .05) \), first-semester GPA \( (p < .01) \), and high school rank \( (p = .03) \) were the three academic variables which significantly added to the prediction model. There were no athletic variables that significantly added to the predictive model for overall GPA.

As a prediction model, the regression equation was particularly powerful at predicting overall GPA, \( F(14) = 142.5, p < .01 \). The first set of predictors, demographic variables, accounted for a significant amount of overall GPA variability, \( R^2 = .19, F(4, 488) = 28.76, p < .01 \). The second set of predictors, academic variables, also accounted for a significant amount of overall GPA variability, \( R^2 = .63, F(7, 481) = 233.93, p < .01 \). The final set of predictors, athletic variables, did not account for a significant amount of overall GPA variability, \( R^2 = .00, F(4, 477) = .85, p = .5 \).

Upon completion of the first regression analysis, the powerful impact of first-semester GPA \( (B = .705) \) became apparent. The influence of first-semester GPA was so dominate in predicting overall GPA, other predictive variables may have been overshadowed within the prediction equation. This result is logical because first-semester
GPA contributes approximately half of the overall GPA at the end of the freshman year (assuming a student enrolled in approximately the same amount of credit hours each semester). To combat this issue, the researcher conducted a second least squares multiple regression analysis with the independent variable of first-semester GPA eliminated from the regression equation.

Table 9 displays the results from an ordinary least squares multiple regression analysis with the variable of first-semester GPA removed. There were two additional participants included in this calculation ($N = 494$) because they were missing first-semester GPA information, which caused them to be excluded in the first regression equation. For the demographic variables, Race 1 ($p < .01$) and gender ($p < .01$) were significant, but distance from home ($p = .74$) was no longer significant. Race 2 was also not significant. The academic variables of high school GPA ($p < .01$) and high school rank ($p = .02$) were significant. Standardized test scores ($p < .01$) and high school size ($p = .03$) were significant, which did not occur when first-semester GPA was included.

There were no significant athletic variables.

As an overall predictive model, this regression analysis was also powerful at predicting overall GPA, $F(13) = 36.23, p < .01$. Demographic variables accounted for a significant amount of overall GPA variability, $R^2 = .2, F(4, 489) = 29.72, p < .01$. Likewise, academic variables accounted for a significant amount of overall GPA variability, $R^2 = .49, F(5, 484) = 56.024, p < .01$. Athletic variables did not significantly predict overall GPA, $R^2 = .5, F(4, 480) = 1.14, p = .34$. 
Table 9

Summary of Ordinary Least Squares Multiple Regression for Variables Predicting

Overall GPA; First-Semester GPA Excluded (N = 494)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.16</td>
<td>.05</td>
<td>.13</td>
<td>3.21</td>
<td>&lt;.01*</td>
</tr>
<tr>
<td>Race 1</td>
<td>-.26</td>
<td>.06</td>
<td>-.16</td>
<td>-4.17</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Race 2</td>
<td>-.06</td>
<td>.09</td>
<td>-.02</td>
<td>-.64</td>
<td>.52</td>
</tr>
<tr>
<td>Distance</td>
<td>.01</td>
<td>.03</td>
<td>.01</td>
<td>.34</td>
<td>.74</td>
</tr>
<tr>
<td>Academic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand. Tests</td>
<td>.03</td>
<td>.01</td>
<td>.16</td>
<td>3.88</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>HS GPA</td>
<td>.41</td>
<td>.07</td>
<td>.36</td>
<td>5.53</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>HS Rank</td>
<td>&lt;-.01</td>
<td>&lt;.01</td>
<td>-.15</td>
<td>-2.40</td>
<td>.02*</td>
</tr>
<tr>
<td>HS Size</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.08</td>
<td>2.16</td>
<td>.03*</td>
</tr>
<tr>
<td>Major</td>
<td>-.08</td>
<td>.05</td>
<td>-.05</td>
<td>-1.63</td>
<td>.10</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>t</td>
<td>sig</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----</td>
<td>------------</td>
<td>------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>Athletic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>-.07</td>
<td>.06</td>
<td>-.05</td>
<td>-1.14</td>
<td>.26</td>
</tr>
<tr>
<td>Coach Change</td>
<td>-.01</td>
<td>.06</td>
<td>-.01</td>
<td>-.22</td>
<td>.83</td>
</tr>
<tr>
<td>Playing Time</td>
<td>.04</td>
<td>.02</td>
<td>.06</td>
<td>1.66</td>
<td>.10</td>
</tr>
<tr>
<td>Win %</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.04</td>
<td>1.01</td>
<td>.31</td>
</tr>
</tbody>
</table>

Note. Race 1 = Caucasian compared to African American. Race 2 = Caucasian compared to other races besides African American. Distance = distance student-athletes attend college from their hometown. Stand. Tests = standardized tests (i.e., a combination of SAT and ACT scores converted to ACT scores). HS GPA = high school grade point average. HS Rank = high school rank. HS Size = high school size (i.e., size of the participant's graduating class). Major = has major or undecided. Sport = revenue sports or non-revenue sports. Coach Change = athletes who have experienced a coaching change or not. Playing Time = amount of games or matches played (minutes played for basketball) divided into thirds. Win % = team winning percentage.

*p < .05. **p < .01.
Predicting Retention Into the Second Year

Table 10 displays the results from a binary logistic multiple regression analysis used to predict retention into the second year of college. Due to listwise deletion, 160 student-athletes were eliminated from the original sample, leaving 514 participants in this analysis. Results revealed Race 1 \( (p = .03) \) and distance from home \( (p = .02) \) were the significant demographic variables. First-semester GPA \( (p < .01) \) was the only significant academic predictor. Playing time \( (p < .01) \) was the only significant athletic predictor.

It is worth noting the variables used in this model produced a correct prediction 85.6\% of the time \( (\text{Chi-square} = 49.366(11), p < .01) \). Of the 514 participants, six student-athletes were predicted to leave the university, but were retained. Conversely, there were 74 student-athletes who were predicted to be retained, but were not. Additionally, Nagelkerke's \( R^2 \) values for each set of predictor variables are as follows; demographic (.04), academic (.12), athletic (.04).

Similar to the model used to predict overall GPA, the model used to predict retention was dominated by first-semester GPA \( (B = -1.167) \). Therefore, first-semester GPA overshadowed the predictive potential of other variables. This complication is logical because of the interrelationship between GPA and the retention of college students. Therefore, a second binary logistic multiple regression analysis was completed after eliminating the variable of first-semester GPA.

Table 11 displays the results from a binary logistic multiple regression analysis used to predict retention into the second year of college with the first-semester GPA removed. There were an additional three student-athletes included in this analysis \( (N = 517) \). Results revealed Race 1 \( (p < .01) \) and distance from home \( (p = .01) \) were the
Table 10

Summary of Binary Logistic Multiple Regression for Variables Predicting Retention

Beyond First Year (N= 514)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. Error</th>
<th>Wald</th>
<th>sig</th>
<th>95% C.I. for Exp (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.01</td>
<td>.34</td>
<td>&lt;.01</td>
<td>.97</td>
<td>.99</td>
</tr>
<tr>
<td>Race 1</td>
<td>.83</td>
<td>.38</td>
<td>4.70</td>
<td>.03*</td>
<td>2.29</td>
</tr>
<tr>
<td>Race 2</td>
<td>.55</td>
<td>.60</td>
<td>.83</td>
<td>.36</td>
<td>1.73</td>
</tr>
<tr>
<td>Distance</td>
<td>.38</td>
<td>.17</td>
<td>5.07</td>
<td>.02*</td>
<td>1.46</td>
</tr>
<tr>
<td><strong>Academic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand. Tests</td>
<td>&lt;.01</td>
<td>.05</td>
<td>.01</td>
<td>.94</td>
<td>1.00</td>
</tr>
<tr>
<td>HS GPA</td>
<td>-.04</td>
<td>.50</td>
<td>.01</td>
<td>.94</td>
<td>.96</td>
</tr>
<tr>
<td>HS Rank</td>
<td>-.01</td>
<td>.01</td>
<td>.44</td>
<td>.51</td>
<td>.99</td>
</tr>
<tr>
<td>HS Size</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.91</td>
<td>.34</td>
<td>1.00</td>
</tr>
<tr>
<td>1st GPA</td>
<td>-1.17</td>
<td>.23</td>
<td>25.13</td>
<td>&lt;.01**</td>
<td>.31</td>
</tr>
<tr>
<td>Major</td>
<td>-.11</td>
<td>.34</td>
<td>.10</td>
<td>.75</td>
<td>.90</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>Std. Error</td>
<td>Wald</td>
<td>sig</td>
<td>Exp(B)</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----</td>
<td>------------</td>
<td>------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Athletic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>.75</td>
<td>.40</td>
<td>3.50</td>
<td>.06</td>
<td>2.11</td>
</tr>
<tr>
<td>Coach Change</td>
<td>.01</td>
<td>.45</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.98</td>
</tr>
<tr>
<td>Playing Time</td>
<td>-.62</td>
<td>.17</td>
<td>13.58</td>
<td>&lt;.01**</td>
<td>.54</td>
</tr>
<tr>
<td>Win %</td>
<td>&lt;-.01</td>
<td>.01</td>
<td>.02</td>
<td>.89</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. Race 1 = Caucasian compared to African American. Race 2 = Caucasian compared to other races besides African American. Distance = distance student-athletes attend college from their hometown. Stand. Tests = standardized tests (i.e., a combination of SAT and ACT scores converted to ACT scores). HS GPA = high school grade point average. HS Rank = high school rank. HS Size = high school size (i.e., size of the participant's graduating class). 1st GPA = first-semester college grade point average. Major = has major or undecided. Sport = revenue sports or non-revenue sports. Coach Change = athletes who have experienced a coaching change or not. Playing Time = amount of games or matches played (minutes played for basketball) divided into thirds. Win % = team winning percentage.

*p < .05. **p < .01.
Table 11

*Summary of Binary Logistic Multiple Regression for Variables Predicting Retention Beyond First Year; First-Semester GPA Excluded (N= 517)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. Error</th>
<th>Wald</th>
<th>sig</th>
<th>Exp(B)</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.21</td>
<td>.33</td>
<td>.42</td>
<td>.52</td>
<td>.81</td>
<td>.43</td>
<td>1.53</td>
</tr>
<tr>
<td>Race 1</td>
<td>1.09</td>
<td>.35</td>
<td>9.45</td>
<td>&lt;.01*</td>
<td>2.96</td>
<td>1.48</td>
<td>5.92</td>
</tr>
<tr>
<td>Race 2</td>
<td>.53</td>
<td>.56</td>
<td>.91</td>
<td>.34</td>
<td>1.70</td>
<td>.57</td>
<td>5.09</td>
</tr>
<tr>
<td>Distance</td>
<td>.40</td>
<td>.16</td>
<td>6.19</td>
<td>&lt;.01*</td>
<td>1.49</td>
<td>1.09</td>
<td>2.03</td>
</tr>
<tr>
<td><strong>Academic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stand. Tests</td>
<td>-.04</td>
<td>.04</td>
<td>.67</td>
<td>.41</td>
<td>.97</td>
<td>.89</td>
<td>1.05</td>
</tr>
<tr>
<td>HS GPA</td>
<td>-.43</td>
<td>.44</td>
<td>.94</td>
<td>.33</td>
<td>.65</td>
<td>.27</td>
<td>1.55</td>
</tr>
<tr>
<td>HS Rank</td>
<td>&lt;.01</td>
<td>.01</td>
<td>.02</td>
<td>.89</td>
<td>1.00</td>
<td>.98</td>
<td>1.02</td>
</tr>
<tr>
<td>HS Size</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
<td>.32</td>
<td>.57</td>
<td>1.00</td>
<td>.10</td>
<td>1.00</td>
</tr>
<tr>
<td>Major</td>
<td>-.06</td>
<td>.33</td>
<td>.03</td>
<td>.87</td>
<td>.95</td>
<td>.50</td>
<td>1.79</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>Std. Error</td>
<td>Wald</td>
<td>sig</td>
<td>Exp(B)</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------</td>
<td>------------</td>
<td>-------</td>
<td>------</td>
<td>--------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Athletic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>.82</td>
<td>.38</td>
<td>4.61</td>
<td>.03*</td>
<td>2.28</td>
<td>1.08</td>
<td>4.84</td>
</tr>
<tr>
<td>Coach Change</td>
<td>.13</td>
<td>.42</td>
<td>.09</td>
<td>.77</td>
<td>.88</td>
<td>.39</td>
<td>2.02</td>
</tr>
<tr>
<td>Playing Time</td>
<td>-.70</td>
<td>.16</td>
<td>18.43</td>
<td>&lt;.01**</td>
<td>.50</td>
<td>.36</td>
<td>.69</td>
</tr>
<tr>
<td>Win %</td>
<td>&lt;-.01</td>
<td>.01</td>
<td>.25</td>
<td>.62</td>
<td>1.00</td>
<td>.98</td>
<td>1.01</td>
</tr>
</tbody>
</table>

Note. Race 1 = Caucasian compared to African American. Race 2 = Caucasian compared to other races besides African American. Distance = distance student-athletes attend college from their hometown. Stand. Tests = standardized tests (i.e., a combination of SAT and ACT scores converted to ACT scores). HS GPA = high school grade point average. HS Rank = high school rank. HS Size = high school size (i.e., size of the participant's graduating class. Major = has major or undecided. Sport = revenue sports or non-revenue sports. Coach Change = athletes who have experienced a coaching change or not. Playing Time = amount of games or matches played (minutes played for basketball) divided into thirds. Win % = team winning percentage.

*p < .05. **p < .01.
demographic variables with significant predictive value. There were no academic variables which significantly predicted retention. The athletic variables of sport ($p = .03$) and playing time ($p < .01$) were significant predictors.

After eliminating first-semester GPA from the equation, this model produced a correct prediction 82.8% of the time ($\text{Chi-square} = 21.688(9), p = .01$). Of the 517 participants, five student-athletes were predicted to leave the university, but were retained. Eighty-four student-athletes were predicted to be retained, but were not. 

*Nagelkerke's R Square* was .05 for demographic values, .02 for academic variables, and .07 for athletic variables.

**Summary**

Chapter four explained the results of the current study. Within this chapter were individual sections entitled project summary, population characteristics, relationships between variables, predicting first-year GPA, and predicting retention beyond the first year. The results from the sample of 674 first-year student-athletes revealed four out of five demographic variables, six out of six academic variables, and two out of four athletic variables were significantly correlated to first-year GPA. After excluding first-semester GPA, six of those variables significantly contributed to predicting first-year GPA. Similarly, four out of five demographic variables, four out of six academic variables, and two out of four athletic variables were significantly correlated to retention beyond the first year of college. Four of those variables significantly contributed to predicting retention beyond the first year of college.
CHAPTER V
DISCUSSION

Project Summary

The current research attempted to determine what combination of demographic, academic, and athletic variables best predicted first-year GPA and retention. GPA and retention were chosen as dependent variables because they are the primary components used to calculate the Academic Progress Rate (APR), a measurement used by the National Collegiate Athletic Association (NCAA) to evaluate real-time academic performance of individual teams. Gaining an understanding of how these predictor variables impact GPA and retention may help provide effective academic support programming for student-athletes. This research is presented in a five-chapter format. Chapter five is a discussion of the results as they pertain to the research questions. This chapter will conclude with suggestions for future research.

Before discussing the results specific to the research questions, it is important to note the powerful part-whole correlation results between first-semester GPA and first-year GPA \((r = .89, p < .01)\). The overwhelming power of first-semester GPA to predict cumulative first-year GPA overshadowed the predictive properties of the remaining variables. Therefore, after obtaining the results from the first set of multiple regression analyses, the researcher determined first-semester GPA should be removed from the list of independent predictor variables. For consistency, first-semester GPA was also
removed as a predictor of retention, and a second set of multiple regression analyses were conducted for both dependent variables. Chapter four presented results of the multiple regression analyses using first-semester GPA (see Tables 8 and 10), and with first-semester GPA removed (see Tables 9 and 11).

The powerfullness of first-semester GPA is supported by previous literature (Belcheir, 2001; Driscoll, 2007; Moore, 2006; St. Thomas, 1982), and makes intuitive sense because first-semester GPA accounts for approximately half of the GPA used to calculate first-year GPA. Coaches and administrators, however, would not have access to first-semester GPA until half-way through a student-athlete's first year of college, which would limit the predictive value of this variable upon entering college. However, once first-semester GPA information was available, it would be wise to use it for GPA forecasting purposes. Therefore, for the remainder of Chapter Five, the discussion will focus on the results calculated without first-semester GPA. Discussing the results without first-semester GPA appears to be a more appropriate way to evaluate the predictive variables, especially for student-athletes entering their first year of college.

Predicting First-Year GPA

The first research question used to guide this study was: what variables predict GPA for student-athletes during the first year of college? This question isolated the overall GPA at the end of the first two college semesters because this variable is crucial to academic standing. A student's academic standing impacts decisions about academic probation, expulsion, and athletic eligibility. APR scores, therefore, are dramatically affected by student-athletes' first-year GPA. Understanding what combination of variables best predict first-year GPA may allow one to better assist student-athletes in
their academic pursuits, ultimately leading to better academic standing and athletic eligibility.

Demographic Variables

As noted previously, demographic variables are population characteristics. Such variables are commonly researched to determine how group attributes impact a variable of interest (Fraenkel & Wallen, 2006). This study identified gender, race, and distance from home as the demographic variables of interest. It was hypothesized all demographic variables would be significant predictors of first-year GPA. Not all variables were found to be significant predictors, but the demographic group of predictors as a whole was significant ($R^2 = .20$, adjusted $R^2 = .19$, $F(4, 489) = 29.72$, $p < .01$).

The first demographic variable examined, gender, is a commonly researched demographic variable which has consistently demonstrated a relationship with academic performance. It is well-documented that females, and female student-athletes in particular, outperform their male counterparts in nearly all academic measures (Babington, 1997; Betz & Fitzgerald, 1987; Durand, 1999; Foltz, 1992; Hosick, 2009; Kane et al., 2008; Mayo, 1982; NCAA Research Staff, 2008; Purdy et al., 1982; Rosser, 1989). The current study confirmed gender as a powerful variable to determine first-year GPA for student-athletes.

The Pearson correlation coefficient between gender and first-year GPA was .36, and significant at the $p < .01$ level. This result demonstrates a moderately strong relationship between gender and first-year GPA, and was nearly the strongest relationship of the three demographic variables used in this study. The ordinary least squares multiple regression analysis revealed gender significantly contributed to the prediction equation of
first-year GPA ($B = .16, p < .01$). The $B$ value of .16 suggests if all other variables were held constant, females would have a GPA .16 higher than males. These results are consistent with the previous literature indicating GPA, high school measures, standardized test scores, graduation rates, and academic motivation are higher for females (Melendez, 2006).

Determining females had a higher first-year GPA, and gender significantly aids in predicting first-year GPA, is much easier than establishing why gender is so powerful. The notion that female student-athletes have a lower level of athletic identity (Menendez, 2006), are more connected to responsibility and care (Chodorow, 1978; Gilligan, 1982), or have a greater investment in social capital (Coleman, 1988) could all be plausible explanations. The answer most likely lies in a combination of these theories. The functional importance of the current research, however, is the application of this information.

If coaches, administrators, and faculty understand gender is a significant variable that predicts first-year GPA, they can make informed programming decisions about resources, curriculum, and academic support. For example, if there are limited academic resources available to an incoming class of first-year student-athletes, it may be reasonable to assume males would need more of these resources than females. It could be expected then, to earn a comparable GPA with females, males on average would see more tutors, have more academic interventions, and be more involved in regulated study activities. However, this type of programming decision may be unlikely given gender equity guidelines in college athletics.
Race was the second demographic variable examined in this study. Like gender, race is a common demographic variable used in a variety of research. Because race was divided into three categories (Caucasian, African American, and other), and because Caucasians dominated the sample \((n = 513)\), the researcher created a system to code the race variable into two categories. The first category, Race 1, is a comparison between Caucasian student-athletes and African American student-athletes \((n = 120)\). The second category, Race 2, is a comparison of Caucasian student-athletes and student-athletes from other races \((n = 41)\). Other races were defined as any race other than Caucasian or African American.

The results of this study revealed Race 1 was both significantly correlated to first-year GPA \((r = .36, p < .01)\), and significantly contributed to predicting first-year GPA \((B = -.26, p < .01)\). Of the three demographic variables, Race 1 had the highest level of correlation with first-year GPA, and impacted the prediction equation most. In fact, a \(B\) value of -.26 indicates African American student-athletes would have a first-year GPA .26 lower than Caucasian student-athletes if all other variables were held constant. These results are not surprising considering research investigating race has consistently found African American students perform at lower academic levels than their Caucasian counterparts (Babington, 1997; Chee et al., 2005; Institute of Diversity and Ethics in Sport, 2006; Kane et al., 2008; Killeya, 2001; Seldacek & Adams-Gaston, 1992; Sellers, 1992; Shapiro, 1984; Siegel, 1994; Walter, et al., 1987; Waugh, et al., 1994).

As discussed in Chapter Two, the reasons for lower African American first-year GPAs may include the desire for equal opportunity and upward mobility while minimizing academic pursuits (Siegel, 1994), a perception of fewer opportunities to gain
social and economic success (Edwards, 1986), an over-developed athletic identity (Ashe, 1977; Menendez, 2006), or modern-day racism (Kihl et al., 2008). Like gender, the reason for a difference in GPAs is probably explained by a combination of these theories. Also similar to gender, the contribution of this research is the functional use of such information. Allocating proper resources, understanding the unique struggles faced by the African American student-athlete, and acknowledging the difference between Caucasian and African American students upon entering college could aid the coach or administrator in proper planning for the challenges African American student-athletes face. Like gender, understanding the difference between races could then aid in the academic planning and resource allocation for this particular student-athlete sub group.

Race 2, the difference between Caucasian and other races, was not correlated with, or significant in predicting first-year GPA. This variable was the only demographic variable not significant in any way. Perhaps the sample of other races was too small (n = 41), or the diversity of the sample was too mundane to differ much from the Caucasian sample. Or, perhaps other races beyond African Americans do not significantly differ from Caucasian student-athletes with regard to first-year GPA. The results of this study suggest other races should be considered similar to Caucasians when predicting first-year GPA.

Distance from home was the final demographic variable investigated with regard to first-year GPA. Although distance from home was significantly correlated to first-year GPA (r = .09, p < .05), it was not significant in predicting first-year GPA. Therefore, the farther a student attends college from their hometown, the lower their GPA. However, when combined with other predictor variables, this relationship was not powerful enough
to significantly aid in predicting GPA. This result is somewhat peculiar, but demonstrates the important difference between correlations and multiple regression analyses. In a correlation statistic the variable is evaluated individually against the dependent variable. In a multiple regression analysis, the variable is one of a combination of potential predictor variables. So, distance from home can be correlated to first-year GPA, but not demonstrate a strong enough relationship in comparison to the other predictor variables, to aid in prediction.

Although distance from home is a consistent reason for college choice (Briggs, 2006; Cunningham, 1997; Cunningham & Fickes, 2000; Higher Education Research Institute, 2008; Jonas & Popovics, 1990; Lam, 1984; Martin, 1996; Mooney et al., 1991; Rajapaksa & Dundes, 2003), and correlated to first-year GPA, predicting first-year GPA is not aided by knowing such a distance. This result is somewhat surprising given the link between distance from home and homesickness (Fisher, 1989). One might assume the farther from home, the more homesick one becomes, and ultimately one's GPA is lowered. Apparently, this is not the case often enough to make predictions about GPA. Therefore, it is reasonable to conclude although there is a relationship between distance from home and first-year GPA, the overall relationship is not powerful enough to predict the amount distance from home lowers GPA after the first year of college.

From a practical standpoint, coaches and administrators should understand the farther a particular student-athlete is from their hometown, the lower their GPA may be. This finding is particularly important for the student-athlete population because they are often recruited from great distances, and rarely get to travel home due to practice and competition schedules. The implications for recruiting and academic planning, therefore,
suggest student-athletes whose hometowns are relatively close to their universities stand a better chance of earning a higher first-year GPA than those students who are from a further distance.

*Academic Variables*

The academic variables chosen for this study involved a combination of test scores, high school variables, and major. Academic predictor variables were chosen because they have been consistently related with other academic outcomes, and are often used in admission and academic programming decisions. Therefore, the current study used established academic criteria to determine which variables predict first-year GPA. It was hypothesized all academic variables would be significant predictors of first-year GPA. Results found all but one of the academic variables were significant predictors of GPA, and academic predictors proved to be the strongest group of predictor variables for first-year GPA ($R^2 = .29$, adjusted $R^2 = .3$, $F (5, 484) = 56.02, p < .01$).

Standardized test scores was the first academic variable investigated in this study. More specifically, the Scholastic Aptitude Test (SAT) and American College Testing (ACT) test were evaluated. For the purposes of this study, SAT scores were converted to ACT composite scores using a concordance table (American College Testing, 2009a). This conversion allowed the researcher to have a consistent scoring format for both the SAT and ACT. Results demonstrated standardized tests were both significantly correlated ($r = .49, p < .01$) and significantly contributed to predicting first-year GPA ($B = .03, p < .01$). In practical terms, these results predict for every point higher a student-athlete scores on standardized tests (ACT scale), they can expect a .03 increase to their first-year GPA, assuming all other variables are held constant.
Although the reliability and validity of standardized tests have been debated for quite some time (Babington, 1997; Baumann & Henschen, 1986; Cantrell, 1999; Hoffman, 1961; Worthen & Spandel, 1991; Young & Kobrin, 2001), this research found standardized tests are a useful tool to help predict GPA after the first year of college. In fact, the results nearly mirrored the findings by Sacks (1997) who found 16% of the variation in freshman grades can be predicted using the SAT. Furthermore, this study confirmed the supposition held by Ayers v. Fordice (1995), Bridgeman and Wendler (1989), Burton and Ramist (2001), and Sacks (1997) who suggested standardized tests are valuable to help predict academic performance, but work best when used in conjunction with other predictor variables.

The practical value of these results are evident. Admissions departments, coaches, administrators, and academic support personnel should utilize the scores from these tests to assist in decisions about recruiting, admissions, and academic performance. Establishing relative cut-off points, or sliding scale measures, are common practices when utilizing standardized test scores. Based on the results of this research, standardized test scores should continue to be used in conjunction with other valuable predictive measures, such as high school GPA.

High School GPA was the first high school academic variable evaluated in this research. Prior research with student-athletes has shown high school GPA is a particularly strong predictor of college GPA for student-athletes (Allen, 1986; Baumann & Henschen, 1986; Lang et al., 1988; Nettles, 1984; Walter et al., 1987). The results of this study confirmed these findings.
High school GPA was both significantly correlated to first-year GPA ($r = .65, p < .01$), and significantly contributed to predicting first-year GPA ($B = .41, p < .01$). Therefore, high school GPA had a particularly strong relationship to the other predictors in the model ($\beta = .36$), demonstrating powerful predictive quality. In fact, if all other variables were held constant, one would expect first-year college GPA to increase by .41 for every point of improvement in high school GPA. This result indicates high school GPA is the most powerful predictor of first-year GPA when compared with all other predictor variables examined in this study.

The logic relating high school GPA to first-year college GPA is simple. One can assume the academic skills and behaviors used to obtain a high school GPA will continue throughout college, producing a similar GPA. Such knowledge can aid coaches and administrators in a pre-screening process to assess how individual student-athletes, or entire incoming classes of student-athletes, will perform. This process can also aid in identifying at-risk student-athletes, aid in admission decisions, or assist advisors when helping students choose majors or individual classes. Therefore, high school GPA is a valuable predictive tool that should be utilized if available to coaches and administrators.

High school class rank was the second high school variable examined in this study. High school rank referred to the number assigned to students resulting in a ranking relative to others in their high school class. The ranking number assigned to students is usually based on some criteria (e.g., GPA) which places students in order from greatest to least.

Like high school GPA, high school rank was both significantly correlated to first-year GPA ($r = -.58, p < .05$) and significantly contributed to the prediction model ($B = -.41$).
.01, \( p < .05 \). Therefore, the higher the high school rank, the higher the first-year college GPA. More specifically, if all other variables were held constant, each increase of 10 percentile points would improve first-year GPA by .04. The similarity between high school GPA and high school class rank is easily understood when one realizes class rank is usually a result of one's high school GPA (Murphy, 1971). This powerful relationship was confirmed by the current study as demonstrated by the strong correlation between the two variables \( (r = -.83, \ p < .01) \). In other words, when a student has a high GPA, they tend to have a high class rank.

The findings in this research are consistent with the findings from Cohn et al., (2004), Dittmar (1977), Hengstler and Reichard (1980), Houston (1980, 1983), Ruban and Nora (2002), Schwartz and Wilber (1981), and Slack and Porter (1980) who suggested high school class rank is important in predicting college academic performance. This research does not support the contentions by Murphy (1971) and Lang (2007) who suggested class rank is an inappropriate measure to predict academic success, or make academic decisions. Used in conjunction with other measures, high school class rank does significantly add to the accuracy of predicting first-year GPA for student-athletes.

In much the same way high school GPA could be used to pre-screen potential student-athletes, high school rank could also be used. Identifying percentile or cut-off levels, particularly in conjunction with class size, would help identify incoming student-athletes who might achieve at differing academic levels. It is also important to note high school rank was significantly correlated \( (p < .01) \) with every other academic variable of interest in this study. These results support the contention of Ashbaugh and Thompson
(1993) who encouraged the use of high school rank only while considering other academic variables such as class size and quality of high school.

High school size was the final high school variable examined within the academic predictor group. For the purposes of this study, high school size was defined as the total number of students in the participant's graduating high school class. The logic for the use of class size to predict first-year GPA and retention, besides its connection to class rank, is straightforward. Larger schools often provide more resources, more diversity, and more educational and extracurricular opportunities (Ashbaugh & Thompson, 1993; Geffert & Christensen, 1998; McDaniel & Graham, 1999). These additional opportunities are thought to produce a more prepared college freshman.

The results of this study confirm high school size is significantly correlated to first-year GPA ($r = .15, p < .01$), and significantly contributed to predicting first-year GPA ($B = < .01, p < .05$). Therefore, the larger the high school, the higher the first-year GPA. Specifically, the results predict for every increase of 100 students in a graduating high school class, one would expect an increase of .02 in first-year GPA of student-athletes, assuming all other variables were held constant. Considering the findings by Geffert and Christensen (1998), as well as Ashbaugh and Thompson (1993), who emphasized the importance of high school size in relationship to available academic resources, it is not a surprise class size is an important factor in predicting first-year college GPA.

Like the other significant academic variables, utilizing information about high school class size can assist admissions counselors, coaches, and administrators in pre-screening student-athletes. Identifying students from larger high schools, particularly
those with ample resources, can aid in predicting first-year GPA. Although these results do not condemn student-athletes from small high schools to a low first-year GPA, it is reasonable to assume a student from a larger high school will be more academically prepared than a student from a small high school with limited resources.

The final academic variable under investigation was major. For the purposes of this study, major was divided into two categories. The first category were students who declared a major upon entering college. The second were students who were undecided upon entering college. Results revealed major was significantly correlated to first-year GPA \( r = -.11, p < .01 \), but did not significantly aid in predicting first-year GPA.

These results are not surprising considering the literature regarding the importance of major is mixed. On one hand, first-year GPA is correlated with choosing a major. This result suggests student-athletes who choose a major upon entering college have a higher first-year GPA than those student-athletes who are undecided. This result supports findings by Cooney (2000), Cooperthwaite and Knight (1995), Gordon and Steele (2003), Roese and Summerville (2005), St. John (2000), and St. John et al. (2004) who suggested choosing a major is an extremely important decision which represents a serious academic commitment. Such a commitment may be representative of the type of student who would be more engaged in their academic endeavors. Additionally, such a student would likely have a higher GPA than a student who did not take this decision seriously. These results do not suggest undecided students cannot take their educational choices seriously, but on average, it appears student-athletes who commit to a major upon entering college perform significantly better than those who do not.
On the other hand, despite the correlation, major did not aid in significantly predicting first-year GPA. This result supports findings from Knight (1994), Kroc et al. (1997), and Schein and Laff (1997) who suggested being undecided did not make a difference in students' path to graduation, and a major may be "bureaucratic, and administrative structures that put arbitrary boundaries on disciplines and restrict creative ways of conceptualizing academic pathways" (Schein & Laff, 1997, p. 42). Considering the correlation, these arguments are at least partly unsubstantiated, but seem to have some credibility when one considers the impact of major was not powerful enough to be a significant predictor of first-year GPA when combined with other variables. From a practical standpoint, it would be of use to note which student-athletes choose a major, and which do not. This observation may help coaches and administrators evaluate the academic goals and level of academic commitment for each student.

**Athletic Variables**

The four athletic variables investigated in this study were sport, coaching change, playing time, and team winning percentage. These variables, although not a comprehensive list of predictive athletic variables, were chosen based on the availability of data to the researcher, and potential to impact GPA and retention of student-athletes. It was hypothesized all athletic variables would be significant predictors of first-year GPA. Results indicated none of the athletic variables significantly attributed to predicting first-year GPA, but two variables were significantly correlated to first-year GPA \( R^2 = < .01, \) adjusted \( R^2 = < .01, F (4, 480) 1.138, p = .34 \).

Sport was the first athletic variable examined. For the purposes of this study sport was divided into revenue sports and non-revenue sports. Revenue sports were defined as
men's football, men's basketball, and women's basketball. All other sports were non-revenue. Results from the Pearson correlations ($r = .37, p < .01$) indicate revenue sports had a significantly lower first-year GPA than non-revenue sports. This result is to be expected given the well-documented discrepancies between the academic performance of revenue and non-revenue sports (Academic Progress Rate, 2009; Christianson, 2009; Eitzen & Purdy, 1986; Kane et al., 2008; Kihl et al., 2008; Lang et al., 1988; Mayo, 1982; NCAA Research Staff, 2009; Riemer et al., 2000; Shapiro, 1984; Young & Sowa, 1992).

Using the same logic, one might expect sport to be a sound predictor of GPA. This was not the case despite having the strongest correlation of all athletic variables. It appears the demographic and academic variables which contributed to predicting first-year GPA were powerful enough to overshadow sport from a prediction equation. When this information is used practically, one can assume revenue sports would require more academic attention than non-revenue sports to acquire the same GPA. However, predicting GPA would be best served by using only demographic and academic variables.

Coaching change was the second athletic variable examined in this study. Coaching change was defined as any change in head coach during the summer before school begins, or during the first year of college. Prior research indicated coaches have an influential role in developing the social, psychological, and developmental growth of student-athletes (Amorose, 2003; Baldwin, 1999; Field, 1991; Gagne, et. al., 2003; Giacobbi et al., 2002; Parsh, 2007). Such research may lead one to conclude a coaching change might negatively impact the academic performance of student-athletes.

Results from this study revealed coaching change had no significant correlation, or significant contribution to predicting first-year GPA. Given the supposed impact
college coaches have on student-athletes, this result was unanticipated. It appears first-year GPA is not impacted by losing a head coach. However, there may be some plausible explanations why this variable proved insignificant.

It is possible the operational definition used in this study could not capture the true impact a college coach has on their student-athletes. For example, if a college coach was removed at the beginning of the summer, the entire summer and first year of college will have passed before the first-year GPA is calculated. During that time it is possible student-athletes recover from the loss of their coach, or make an equally meaningful connection with their new coach. Likewise, if a student-athlete loses their coach at the end of their first college year, the majority of their first-year GPA may already be established. It is also possible the status of the athlete / coach relationship for coaches who are removed (terminated or promoted) versus coaches that remain, are different. Perhaps the relationships between coaches who leave their teams and student-athletes are not as strong as those relationships with established coaches. This weakened relationship may be a partial explanation indicating why coaches leave or are terminated. This study did not attempt to ascertain specifically when coaches left their position, or what type of individual relationships existed between coaches who left versus coaches who were retained.

Playing time was the third athletic variable examined. For the purposes of this study, individual playing time was defined as the number of games played by a student-athlete during their first academic year, except in the sport of men's and women's basketball. Because the basketball programs tally the exact minutes played, and because this measure of playing time is more precise than games played, minutes played were
used to determine playing time for both men's and women's basketball teams. There were three levels of playing time based on the number of total games for each sport. Low playing time was defined as playing in one third or less games. Medium playing time was defined as playing between one third and two thirds of games. High playing time was defined as playing in two thirds or more of the games. Similar to the variable of sport, the results of this study revealed playing time was significantly correlated with first-semester GPA ($r = .15$, $p < .01$), but did not significantly aid in predicting first-year GPA.

The results of the correlation statistic indicates the lower the playing time, the lower the first-year GPA. This result is not a surprise considering the majority of Division I college student-athletes were among the best athletes on their high school teams, but may not earn much playing time their first-year of college (Moe, 1994; Murphy, 1991). This lack of playing time appears to impact other aspects of a student's life, including academic pursuits. This result is conceivable when one considers the potential impact of playing time on athletic identity, motivation, and enjoyment (Petlichkoff, 1993a, 1993b; Weiss et. al., 1990).

In much the same way the variable of sport was overshadowed by demographic and academic variables within the prediction equation, playing time might also have been overshadowed. This may explain why playing time was significantly correlated to first-year GPA, but did not significantly aid in predicting first-year GPA. Although there is a clear link between playing time and first-year GPA, coaches and administrators should be careful to avoid predicting all students with low-playing time will earn a low GPA. This is not the case. In fact, there were many individual student-athletes within this study who achieved high first-year GPAs, but had low levels of playing time. More importantly,
these results should send a signal to coaches and administrators that for the average first-year student-athlete playing time is tied to academic performance, and understanding how this link may impact individual students, in combination with other variables, could aid in the level of academic intervention.

Team winning percentage was the final athletic variable under investigation. To calculate winning percentage, the researcher divided the number of team wins by the total games in a particular sport season. Prior research has shown the winningest teams, particularly in revenue sports that reach televised post-season competition, produce relatively low academic outcomes (Amato et al., 1996; Christianson, 2004; Hosick, 2009; Hurley, 1993; Institute for Diversity and Ethics in Sport, 2008; NCAA Research Staff, 2008; Shapiro, 1984). Such findings continue to reinforce the dumb jock stereotype. However, other findings have concluded team success dramatically impacts freshman admission applications and financial contributions from donors (McCormick & Tinsley, 1987; Stinson & Howard, 2008). This evidence insinuates a link between academic success and team athletic success, and begs the question of whether winning in athletics can go hand in hand with academic achievement.

The results of this study indicate team winning percentage is not related to first-year GPA. This finding reveals student-athletes as a whole are able to separate their athletic team performance from their academic responsibilities. Additionally, this finding, in conjunction with the results from playing time, suggests team winning percentage impacts student-athletes' first-year GPA less than individual playing time. This notion is consistent with findings from Akker (1995) and Kotlyarenko and Ehrenberg (2000) who found student-athletes' GPAs were similar to non-athletes, and high athletic success can
be matched with high academic success. Coaches and Administrators can breathe a sigh of relief knowing team athletic success does not impact student-athletes' first-year GPA.

Predicting Retention Beyond the First Year

The second research question used to guide this study was: what variables predict retention of student-athletes beyond the first year of college? For the purposes of this study, students were defined as retained if they were enrolled at Ball State University after the final day to add/drop classes in the fall of their second academic year (i.e., end of the first week of classes). Retention was chosen as a dependent variable in this research because of its link to the NCAA APR, which uses retention in its calculations. Furthermore, from an athletic standpoint, understanding what variables contribute to student-athlete retention can help coaches and administrators to better intervene in the lives of student-athlete, ensuring a prolonged college experience.

Demographic Variables

The demographic variables of gender, race, and distance from home were examined. It was hypothesized all demographic variables would be significant predictors of retention. The model produced from the binary logistic multiple regression analysis indicated the demographic variables as a whole were significant in predicting retention ($Chi-square = 16.26(4), p < .01, Naglekerke R Square = .05$), but not all individual demographic variables significantly aided in predicting retention.

The first demographic variable, gender, was neither significantly correlated, nor significant in predicting retention. These results differ from first-year GPA where gender was significant on both counts. Such results are somewhat curious given the documented
discrepancy of student-athlete graduation rates based on gender (Institute of Diversity and Ethics in Sport, 2009b).

Perhaps using retention data for the first year is not enough information to responsibly link gender to graduation rates. In other words, even though research has shown gender is significant to predict college graduation, it is not significant enough to predict retention after only one year of college. Therefore, it can be reasoned the impact of gender is not profound enough to affect retention after one year of college, but might after several years. Based on the results of this study, coaches and administrators should not expect male and female retention rates to differ after one year.

The second demographic variable examined was race. In the same way race was divided into two groups when examining first-year GPA, it was also divided when examining retention. Race 1 was found to be correlated to retention more so than any other demographic variable ($r = .16, p < .01$). Race 1 also significantly contributed to predicting retention into the second year of college ($B = 1.09$, $Wald = 9.45$, $Exp(B) = 2.96$, $p < .01$). These results suggest the odds of not being retained after the first year are 2.96 times higher for African American student-athletes than for Caucasian student-athletes, after controlling for all other variables. Similar to the findings between Race 1 and first-year GPA, this result is supported by numerous findings. Most notably, African American students consistently are found to have lower GPAs, graduation rates, and APR scores than Caucasian student-athletes (Babington, 1997; Chee et al., 2005; Institute of Diversity and Ethics in Sport, 2006; Kane et al., 2008; Killeya, 2001; Sedlacek & Adams-Gaston, 1992; Sellers, 1992; Shapiro, 1984; Siegel, 1994; Walter et al., 1987; Waugh et
al., 1994). These academic measures are likely to influence some decisions about persisting into the second year of college.

From a practical standpoint, it is important to note both first-year GPA and retention were significantly predicted by Race 1. This suggests African American student-athletes are doubly at risk to negatively affect APR scores. For this reason, as well as the multitude of other studies identifying African American student-athletes as more academically at risk, coaches and administrators should expect more time and academic resources be allocated to the average African American student-athlete.

Race 2 was not significantly correlated with retention, nor did Race 2 significantly contribute to predicting retention. These results suggest, in much the same way as first-year GPA, student-athletes from other races are not different than Caucasian student-athletes with regard to retention. In other words, minority student-athletes who are not African American can expect to be retained at the same level as Caucasian student-athletes.

The final demographic variable, distance from home, was both significantly correlated ($r = .09, p < .05$) and significantly helped predict retention ($B = .4, Wald = 6.19, \text{Exp}(B) = 1.49, p < .05$). Therefore, the farther a student-athlete's college is from their home, the less likely they are to be retained into their second year of college. More specifically, the odds of not being retained increase 1.5 times for each distance level investigated in this study, assuming all other variables are constant. For example, student-athletes whose homes are between 101 and 250 miles from their college are 1.5 times more likely to be retained than student-athletes whose homes are more than 250 miles from their college, and 1.5 times less likely to be retained than student-athletes whose
homes are within 100 miles of college. Furthermore, students whose homes are within 100 miles of their college are three times as likely to be retained as students whose homes are more than 250 miles from their college.

The capability of distance from home to predict retention, rather than first-year GPA, is supported by numerous sources. It has been found distance from home is one of the most important reasons college students choose their institution (Briggs, 2006; Higher Education Research Institute, 2008; Cunningham, 1997; Cunningham & Fickes, 2000; Jonas & Popovics, 1990; Lam, 1984; Martin, 1996; Mooney, Sherman, & Lo Presto, 1991; Rajapaksa & Dundes, 2003). It is also thought homesickness is precipitated by the distance a college student is separated from their family, and their inability to interact with their social support networks found in high school (Fisher, 1989). Furthermore, in the college recruiting process student-athletes are sometimes recruited from great distances (Baldwin, 1999), and may receive scholarships only from institutions far from their homes. Such limited scholarship opportunities may handcuff a student to accept a scholarship from an institution far away, while potentially ignoring the importance of the distance from home. All of these factors appear to support the findings that distance from home has a significant impact on retention.

From a practical standpoint, this information can be extremely valuable to coaches with regard to recruiting. If coaches know distance from home is an important variable in retaining student-athletes, they may be more inclined to spend their time and resources recruiting student-athletes within a reasonable distance from their university. From an APR standpoint, even though distance from home did not significantly help predict first-year GPA, coaches and administrators should be aware distance from home
is important to predict retention, which is equally important as first-year GPA when calculating APR scores.

A final point about distance from home should be mentioned. The correlation between Race 1 and distance from home was significant ($r = .12, p < .01$). This result suggests more African American student-athletes are recruited from further distances. This fact is important because both Race 1 and distance from home significantly contributes to predicting retention. Therefore, coaches at this particular university should be aware that recruiting African American student-athletes from more than 250 miles away more than triples the likelihood such student-athletes would not be retained into their second year of college, assuming all other variables were held constant.

*Academic Variables*

The academic variables used to predict retention were standardized tests, high school GPA, high school rank, high school size, and major. All academic variables were hypothesized to aid in predicting retention beyond the first year of college. Results from the binary logistic multiple regression analysis revealed none of the academic variables significantly aided in the prediction of retention ($Chi-square = 5.48(5), p = .01$, *Nagelkerke R Square* = .02), but three of the five variables were correlated to retention. These results suggest we can use some academic variables to make generalizations about retention, but cannot predict how much such a relationship would impact retention. These results also suggest academic predictor variables are much more valuable to predict first-year GPA than they are to predict retention.

The first academic variable examined was standardized test scores. Results indicated retention was significantly correlated to standardized test scores ($r = -.11, p <$
Therefore, the higher the test scores for student-athletes, the more likely a student-athlete is to be retained. These results make sense considering standardized test scores are used to predict academic performance (Ayers v. Fordice, 1995; Bridgeman & Wendler, 1989; Burton & Ramist, 2001; Sacks, 1997), and academic performance often dictates a student's liberty to remain in college.

Coaches and administrators should be aware that although standardized test scores cannot predict retention, they are correlated to retention, and predict first-year GPA. These findings signify standardized test scores are useful to predict APR scores and should be considered a valuable pre-screening tool for student-athletes. This value is enhanced when one considers the two dependent variables of first-year GPA and retention are also significantly correlated (r = -.26, p < .05).

High school GPA was the second academic variable investigated. Similar to standardized test scores, high school GPA was one of the three academic variables significantly correlated to retention (r = -.14, p < .01). This result implies the higher the high school GPA, the more likely a student-athlete is to be retained into the second year of college. Also similar to standardized test scores, high school GPA has been consistently found to predict college academic performance (Allen, 1986; Baumann & Henschen, 1986; Lang et al., 1988; Nettles, 1984; Walter et al., 1987). In fact, results in this study indicated high school GPA was the most powerful predictor of first-year GPA. Thus, one can assume the correlation between high-school GPA and retention exists because of the ability of high school GPA to strongly predict first-year college GPA, which is correlated to retention.
From a coach's perspective, high school GPA should be considered extremely valuable. As the strongest predictor of first-year GPA, in addition to its correlation with retention, high school GPA appears to be a crucial piece of information. Utilizing high school GPA to help with decisions about recruiting, academic support services, and probability of individual student-athlete success, is recommended.

High school class rank is the second high school variable, and third academic variable investigated in this study. In addition to standardized test scores and high school GPA, class rank was the third academic variable significantly correlated with retention \((r = .12, p < .01)\). Not surprisingly, high school rank and high school GPA performed similarly in this study with regard to both dependent variables. As noted earlier in chapter five, when one considers the strong correlation between class rank and high school GPA \((r = -.83, p < .01)\), these results were anticipated.

Although class rank does not contribute to the prediction of retention, the correlation suggests class rank could be used in conjunction with other academic information to determine an academic profile from which decisions could be made. For example, if a coach or administrator knows a student-athlete has a strong high school GPA, high standardized test scores, and is in the top 10% of their class, it is likely the student will be retained (and likely they will have a relatively high first-year GPA). This logic is supported by the current research and the previously discussed literature, which demonstrated a link between high school rank and college academic performance (Cohn et al., 2004; Dittmar, 1977; Hengstler and Reichard, 1980; Houston, 1980, 1983; Ruban & Nora, 2002; Schwartz & Wilber, 1981; Slack & Porter, 1980).
High school size is the third high school variable, and the fourth academic variable examined in this study. This variable was neither correlated with, or helped predict, retention. The finding that size of a student-athlete's graduating class is not significant to retention, but is significant to first-year GPA, is corroborated based on a few important factors. First, GPA is an academic measure that appears to be linked to high school size because of the resources available, and the extracurricular activities afforded (Ashbaugh & Thompson, 1993; Geffert & Christensen, 1998; McDaniel & Graham, 1999). Resources and opportunities, therefore, better prepare students for the multitude of opportunities and challenges in college, and therefore produce higher GPAs.

Second, based on the previous research and analogies provided by Espenshade et al. (2005) it could be theorized larger high schools have an atmosphere similar to a college campus where students regularly socialize with new people and have a variety of academic options. In essence, those students from larger high schools might already be a small fish in a big pond. Students from small high schools, especially student-athletes, may be big fish in a small pond until they enter college where they are transformed into small fish. Such an atmosphere may allow students from larger high schools to more quickly acclimate to their college surroundings because they are familiar with such an environment. The ability to quickly adapt to the college environment may impact GPA, and not retention. In other words, students from a large high school may find their coursework suffers less than a student from a small high school who may have a difficult time adapting to the larger social context of a college or university. Therefore, students from both large and small high schools are equally retained, but students from smaller
high schools may take longer to adapt to college, thus explaining the significant difference in GPA.

Additionally, student-athletes in this particular study were members of a university with a particularly strong program designed to help first-year students acclimate to college. The Freshman Connections program divides all first-year students into ten small learning communities where students live in the same residential housing, and take classes together. The goal of this program is to "deepen the contact new students have with faculty, staff, and fellow students in order to improve learning and persistence to graduation" (Ball State University, 2010, ¶ 2). It is certainly conceivable a program with small learning communities was influential in the retention of student-athletes, thereby reducing the impact class size might have otherwise had on retention.

The final academic variable, major, was not significantly related to retention. Given the literature does not provide an overwhelming consensus regarding the impact of major, it is not surprising this variable is of minimal value to predict retention (Knight, 1994; Kroc et al., 1997; Schein & Laff, 1997). These results, however, do not suggest coaches and administrators should ignore a student's choice of major. Instead, coaches and administrators should evaluate why their undecided students have not committed to a major, and discern why some students choose their particular majors. Such information can be used in conjunction with other demographic, academic, and athletic variables to gauge an overall level of academic potential and commitment. Additionally, the finding that major was significantly correlated with first-year GPA does suggest value in this variable.
**Athletic Variables**

The final group of predictive variables were athletic in nature. These variables included sport, coaching change, playing time, and team winning percentage. It was hypothesized all athletic variables would be significant predictors of retention. This hypothesis was not realized. However, two athletic variables significantly predicted retention. The overall model produced from all athletic variables by the binary logistic multiple regression analysis indicated athletic variables as a whole were significant in predicting retention ($\text{Chi-square} = 6.09(4), \ p < .01, \ \text{Nagelkerke R Square} = .02$).

The first athletic variable examined was sport. Results indicated revenue sports were significantly less likely to be retained than non-revenue sports ($r = -.09, \ p < .05$). Additionally, sport type significantly aided in predicting retention ($B = .82, \ \text{Wald} = 4.61, \ \text{Exp} (B) = 2.28, \ p < .05$). In fact, if all variables are held constant the odds of not being retained are 2.28 times higher for revenue sports.

Such results were anticipated due to the overwhelming amount of research indicating student-athletes in revenue sports have lower scores in virtually every academic measure used to evaluate student-athletes (Academic Progress Rate, 2009; Christianson, 2009; Eitzen & Purdy, 1986; Kane et al., 2008; Kihl et al., 2008; Lang et al., 1988; Mayo, 1982; NCAA Research Staff, 2009; Riemer et al., 2000; Shapiro, 1984; Young & Sowa, 1992). In particular, the strongest existing evidence to support the retention findings of this study appear to be graduation success rates. Although the current study examined retention after only one year of college, it is reasonable to conclude there is a link between first-year retention and graduation. Therefore, results
from this study and the NCAA (NCAA Research Staff, 2008) confirm the type of sport is a valuable indicator of college persistence after one year, and through to graduation.

The practical implications of these results are obvious. Student-athletes in revenue sports should be considered more at risk to leave the university than student-athletes in non-revenue sports. The sports of men's football, men's basketball, and women's basketball may require more attention, programming, support, and structure during their first year of college than students in non-revenue sports. Additionally, identifying student-athletes on revenue sport teams, in combination with other athletic, demographic and academic variables, can aid in developing a comprehensive academic profile of the student-athlete which can be used to develop specific programming accommodations.

Coaching change was the second athletic variable examined in this study. Similar to first-year GPA, there was no relationship between coaching change and retention. These results indicate losing a college coach has no significant retention impact on the average student-athlete. As previously noted, these results were somewhat surprising given the conventional wisdom that college coaches are social and psychological caretakers of their student-athletes (Amorose, 2003; Baldwin, 1999; Field, 1991; Gagne et al., 2003; Giacobbi et al., 2002; Parsh, 2007).

Perhaps, as noted earlier, the operational definition of coaching change encompassed too wide of a time frame to truly capture the impact of such a loss. Or, perhaps the relationships between coaches who leave their jobs and student-athletes are already poor, which could be a factor leading to the coaching change. This study did not examine the terms under which a coaching change was made (i.e., terminated versus promotion), which may provide important insight into the overall impact of the coach.
Furthermore, it may be appropriate to challenge the common assumption college coaches are as important in the lives of student-athletes as they are thought to be. Empirically evaluating coach / athlete relationships appears justified to determine the impact of a coach, especially when much of the information about coaching relationships is conjecture.

Playing time was the third athletic variable examined in this study. Results revealed the amount of individual playing time a student-athlete receives is significantly correlated to retention ($r = -.17, p < .01$). Playing time was also a significant predictor of retention ($B = -.70, Wald = 18.43, Exp(B) = .5, p < .01$). These results suggest the more playing time a student-athlete receives, the more likely they are to be retained. More specifically, as a student-athlete's playing time increases by each level defined in this study, the odds of not be retained decrease by 50%. Therefore, student-athletes who play in more than two thirds of their games during their first-year are 100% more likely to be retained than student-athletes who play in less than one third of their games, assuming all other variables are held constant.

The results of this study, combined with the previous literature, imply playing time is a powerful force in the lives of first-year college student-athletes (Wang et al., 2004). For example, it is logical to believe student-athletes at the Division I level were excellent athletes at their individual high schools, and likely did not have to worry about playing time (Moe, 1994). From an athletic standpoint, those athletes were big fish in a small pond (Murphy, 1991). This high school athletic dominance is likely tied to a strong athletic identity, which results in better coping skills (Kauss, 1978), as well as increased motivation, satisfaction, enjoyment, and confidence (Demaine & Short, 2007;
Petlichkoff, 1993a, 1993b; Weiss et al., 1990; Weiss & Frazer, 1995). If student-athletes are removed from an environment of high playing time in high school, and placed in a situation where they rarely play in college, the positive associations with playing time are likely to be reduced or eliminated. The result for many student-athletes with low first-year playing time appears to be retreat from the situation, many times to pursue playing time at other institutions.

From a practical standpoint, college coaches should be keenly aware many first-year student-athletes will not be satisfied with a low level of playing time. Such dissatisfaction increases the likelihood the student-athlete will not be enrolled at the same university after the first year of college. Although many coaches are unlikely to adjust their in-game strategies, and resist accommodating student-athletes by providing more playing time, the results of this study could aid coaches in considering how playing time impacts the individual student-athlete, and ultimately the team. This understanding could then lead coaches to better prepare student-athletes for their individual role on the team, and how such a role could evolve after their first year of college.

The final athletic variable examined was team winning percentage. Similar to the results for first-year GPA, team winning percentage was not significantly related to retention. These results confirm the powerfulness of individual factors versus team factors. In other words, the choice to remain at a particular university is influenced more by a student-athlete's individual playing time than by the winning percentage of their team. Therefore, it appears student-athletes can better tolerate team losses than limited individual participation.
Anyone associated with college athletics would be wise to understand these results are counterintuitive to the philosophy of many college athletic departments and team sports. Winning, which has become the primary mark of evaluation for many college athletic programs and their fans (McCormick & Tinsley, 1987) does not appear to be as important to the individual student-athlete as their playing time. In the age of the APR, where retention matters, coaches and administrators may want to worry a bit less about wins and losses, and a bit more about the individual student-athlete experience. Accepting this idea is likely to be more difficult than it appears given the modern world of big time college sports where commercialism, financial arms races, and an emphasis on winning appears to be the standard (Knight Commission, 2001, 2009).

Conclusions

This study attempted to ascertain what combination of demographic, academic, and athletic variables best predicted GPA and retention of first-year college student-athletes. GPA and retention were chosen as dependent variables because they are two primary determinates of the APR, a real time academic measure used by the NCAA to evaluate team academic performance. The first dependent variable, first-year GPA, was best predicted by a combination of demographic and academic variables. Specifically, all of the demographic variables were correlated to first-year GPA, with gender and race being significant predictors. Likewise, all of the academic variables were correlated with first-year GPA, and all academic variables except major significantly aided in prediction. As a group, the academic variables were the strongest predictors of first-year GPA, with high school GPA as the single-most powerful predictor. None of the athletic variables
were significant predictors, but sport and playing time were significantly correlated to first-year GPA.

The results reinforced the powerfulness of the traditional demographic and academic variables used to predict college academic performance. It is not a surprise these variables are significant predictors of first-year GPA considering the vast use of these variables by college admission departments, as well as the plethora of research indicating college GPA is linked to these variables. In fact, this study confirmed that 50% of the total variance in first-year GPA was explained by the significant demographic and academic variables investigated in this study. Furthermore, when first-semester GPA is included in the prediction formula, 81% of the variance was explained. This study clearly demonstrated that coaches and administrators should use traditional demographic and academic variables to make informed decisions about potential GPAs. Additionally, it would be wise to identify these traditional variables for student-athletes in revenue sports, or who do not earn much playing time as freshman, because those athletic variables signify student-athletes who are more at-risk to achieve a low first-year GPA.

The second dependent variable, retention, was best predicted by a combination of demographic and athletic variables. The demographic variables of race and distance from home were both correlated, and significantly contributed to predicting retention. Similarly, the athletic variables of sport and playing time were correlated, and significant for predicting retention. The most powerful group of predictors for retention were athletic variables, with playing time the single most powerful predictive variable. None of the academic variables were significant predictors of retention, but all were correlated with retention except high school size and major.
The retention results are particularly powerful because they suggest persistence into the second year of college has more to do with who the individual is (i.e., demographic and athletic variables), rather than what type of student they have been in the past (i.e., academic variables). These results confirm the significance of this study, and validate the use of athletic variables as predictors of retention. Most notably, the importance of athletic identity (Melendez, 2006) is manifested by the worth of individual playing time. In other words, the amount an individual student-athlete plays in their particular sport is the greatest determinant of their commitment to remain at their institution after their first year of college. From an athletic coaching standpoint, it is critical to note individual playing time was more important than team winning percentage, which is counterintuitive to a "team first" mentality. This result suggests first-year student-athletes would be more likely to be retained if they earned a high amount of playing time on a losing team, rather than a low amount of playing time on a winning team. Apparently, there is an I in team.

Although not all variables examined in this study were significant predictors of first-year GPA and retention, results suggest a combination of demographic, academic, and athletic variables did aid in prediction. These specific variables could be used by coaches and administrators to develop a comprehensive profile which could be used to make decisions about recruiting, coursework, athletic participation, and resource allocation. The results could also be used to better understand the overlapping impact of these variables on APR scores. After all, GPA and retention are both necessary to determine APR scores, which implies any variable significant to GPA or retention is important to APR calculations.
Limitations

The following limitations applied to this study:

1. Only student-athletes at Ball State University were participants in this study. Generalizing the results to institutions dissimilar to Ball State University may be inappropriate. Much smaller or larger institutions may provide different resources causing their student-athletes to perform differently than those at Ball State University. Likewise, private schools and schools in different NCCA divisions may provide different experiences than might be found at Ball State University.

2. The results are limited to the variables examined by the researcher. It is possible there are variables beyond this study that may predict academic success and retention more accurately than the ones chosen for this research. Although such variables have not been identified, such a possibility should be acknowledged.

Suggestions for Future Research

The following suggestions are made for future research.

1. Replicate the study at other institutions. This study only examined first-year student-athletes at Ball State University during a five-year period. If such research could be replicated at a variety of other institutions with different types of student-athlete populations, results may reveal differences in the variables observed. For example, students at large Bowl Championship Series (BCS) institutions, Division II and III schools, or historically black institutions, may provide different results because they may have different athletic goals and academic resources.

2. Identify other potential variables which could predict GPA and retention for student-athletes. This study utilized a relatively small group of predictor variables
because of their availability. If, for example, a researcher could gain access to athletic training records, the researcher might be able to determine if athletic injuries impact GPA and retention. Other potential variables might include scholarship versus non-scholarship student-athletes, team versus individual sports, individual athletic position (e.g., offense versus defense, position group, or starters versus bench), and public versus private high schools.

3. Focus on the other interactions between variables investigated in this study. For example, understanding how gender or race impacts playing time or coaching changes could lead to valuable links between these variables, which might help establish better programming efforts for coaches and administrators. Furthermore, given the powerful impact of first-semester GPA, this variable might be better utilized as a dependent variable.

4. Reevaluate the definition of coaching change. As previously indicated, the results from this study did not reveal coaching change as a significant factor in predicting first-year GPA or retention. It is possible the operational definition was not specific enough to capture any true impact of a coaching change. Identifying the specific time when a coach leaves, the conditions under which a coaching change was made, and the type of relationships between coaches and student-athletes, might better determine the impact a coaching change has on individual student-athletes. Additionally, identifying which coach (head vs. assistant) spends the most time with a student athlete may provide insight into the coach / athlete relationship. Capturing these specific conditions, especially the perceived relationships between student-athletes and coaches, might be best served by a qualitative analysis.
5. Continue to monitor the participants through to graduation. The current study only examines student-athletes in their first year of college. Determining what factors predict college graduation, and if those factors are different from what predicts retention into the second year, is worthwhile. Therefore, graduation statistics could be used as an additional dependent variable.

6. Identify the impact of these variables on APR scores. Although the focus of this study was the variables used to calculate APR scores, APR scores themselves were not used as a dependent variable. A follow-up study to investigate the link between these results and APR scores appears to be a logical next step.
References


Hengstler, D. D., & Reichard, D. J. (1980, April). *Examination of alternative methods and policies for improving the predictive validity of SAT scores and high school rank in freshman admission decisions*. Paper presented at the Annual Forum of the Association for Institutional Research, Atlanta, GA.


Knight, W. E. (1994, May). Why the five-year (or longer) bachelors degree?: An exploratory study of time to degree attainment. Paper presented at the annual forum of the Association for Institutional Research, New Orleans, LA.


Appendix A

Playing Time Criteria by Sport
<table>
<thead>
<tr>
<th>Sport</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseball</td>
<td>games played</td>
</tr>
<tr>
<td>Basketball (Men’s and Women’s)</td>
<td>minutes played</td>
</tr>
<tr>
<td>Field Hockey</td>
<td>games played</td>
</tr>
<tr>
<td>Football</td>
<td>games played</td>
</tr>
<tr>
<td>Golf (Men’s and Women’s)</td>
<td>rounds played</td>
</tr>
<tr>
<td>Gymnastics</td>
<td>meets competed in</td>
</tr>
<tr>
<td>Soccer</td>
<td>games played</td>
</tr>
<tr>
<td>Softball</td>
<td>games played</td>
</tr>
<tr>
<td>Swimming/Diving (Men’s and Women’s)</td>
<td>meets competed in</td>
</tr>
<tr>
<td>Tennis (Men’s and Women’s)</td>
<td>matches played</td>
</tr>
<tr>
<td>Track and Cross Country</td>
<td>meets competed in</td>
</tr>
<tr>
<td>Volleyball (Men’s and Women’s)</td>
<td>matches played</td>
</tr>
</tbody>
</table>
Appendix B

Institutional Review Board Approval
Institutional Review Board

DATE: October 21, 2009

TO: James Johnson

FROM: Ball State University IRB

RE: IRB protocol # 135600-1
TITLE: Predicting First-Year Grade Point Average and Retention of Student-Athletes using Demographic, Academic, and Athletic Variables
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: October 21, 2009

The Institutional Review Board reviewed your protocol on October 21, 2009 and has determined the procedures you have proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol, and you are cleared to proceed with the procedures outlined in your protocol. As an exempt study, there is no requirement for continuing review. Your protocol will remain on file with the IRB as a matter of record.

While your project does not require continuing review, it is the responsibility of the P.I. (and, if applicable, faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project. Please contact Amy Boos at (765) 285-5034 or akboos@bsu.edu if you are unsure whether your proposed modification requires review or have any questions. Proposed modifications should be addressed in writing and submitted electronically to the IRB (http://www.bsu.edu/irb) for review. Please reference the above IRB protocol number in any communication to the IRB regarding this project.

Reminder: Even though your study is exempt from the relevant federal regulations of the Common Rule (45 CFR 46, subpart A), you and your research team are not exempt from ethical research practices and should therefore employ all protections for your participants and their data which are appropriate to your
Appendix C

Letter of Approval from Coordinator of Academic Support Services
To Whom It May Concern,

James Johnson has my full permission to use information and resources from the Office of Academic Support Services for Student Athletes while collecting data for his dissertation. I understand James will be investigating the academic performance of student athletes and will need access to confidential institutional information. James has explained to me the details of his research, including the process to ensure no individual student athletes are identifiable within the results. I am satisfied he is taking all necessary steps to ensure confidentiality of the student athletes. I am also supportive of this research as it may provide great insight into the future programming of Academic Support Services for Student Athletes.

Respectfully,

Pam Riegle, Ed.D.