SELECTED ACADEMIC VARIABLES AS PREDICTORS OF FIRST SEMESTER
ACADEMIC SUCCESS OF AT-RISK FOOTBALL STUDENT-ATHLETES AT THE
UNIVERSITY OF MISSOURI

A Dissertation
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by

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A candidate for the degree of Doctor of Philosophy

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

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ABSTRACT

This study investigated the effects of selected academic variables on the academic performance of at-risk football student-athletes who matriculated at the University of Missouri (MU) during the academic years of 2002-03, 2003-04, and 2004-05. This study attempted to identify traditional academic variables that might explain the variance in the cumulative grade point average (GPA) at the end of the first semester among the aforementioned student-athlete population.

Academic variables included high school GPA, high school rank, and ACT composite score. A stepwise multiple regression analysis was used to analyze each of the predictor variables as they related to first semester college GPA and each other.

The results of this study indicated that high school GPA accounted for 21 percent of the variance in student-athletes' first semester college GPA and was the only significant predictor of student-athletes' first semester college GPA. When added to the regression model, high school rank and ACT composite increased the explained variance in first semester college GPA by 1 percent.

The results of this study suggest that high school GPA is the best predictor of first semester college GPA among the traditional academic variables analyzed for the population studied. Further research is needed to explore the relationship between non-cognitive variables and college academic success for at-risk student-athletes in predicting college grade point average.

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CHAPTER I

INTRODUCTION

Intercollegiate athletics has become a highly visible facet of today's universities across the nation. To many, an athletic department is perceived as the "front porch" of the institution to which it is a part of. In other words, an institution's image can be formed by the performance and visibility of its athletic teams (Mixon, 1995; Toma & Cross, 1996; Watterson, 2000; Zimbalist, 1999). As a result, there has been an increased interest by university administrators, athletic administrators, faculty and various researchers into the academic preparedness and performance of students participating in intercollegiate athletics. In particular, areas of interest include grade point averages, retention rates, and graduation rates (Kiger & Lorentzen, 1986; Petrie, 1993; Sedlacek & Adams-Gaston, 1992; Sellers, 1992; Young & Sowa, 1992).

According to Petrie and Stoever (1997), the increased interest is associated with the established admission standards for student-athletes created by the National Collegiate Athletic Association (NCAA). These standards dictate a student-athlete's participation in intercollegiate athletics during their first year of collegiate enrollment based solely upon traditional academic measures (i.e. standardized test score and high school grade point average).

In 1983, the NCAA voted to make the academic standards for students participating in Division I athletics more stringent. Known as Proposition 48, prospective student-athletes were required to achieve a minimum composite score of 15 on the American College Test (ACT) or a combined score of 700 on the Scholastic

Achievement Test (SAT) combined with a high school grade point average of 2.0 in eleven (11) core high school courses to be eligible to compete in intercollegiate athletics. If a student-athlete failed to meet these minimum standards, he/she could not participate in athletics or receive athletic related financial aid during their first year of collegiate enrollment at a four year institution.

On August 1, 1986, the NCAA voted Proposition 48 into effect (NCAA, 1983). Supporters of Proposition 48 were hopeful this minimum criteria would achieve two objectives: (1) motivate high schools to better prepare students for college and (2) filter out those students whose educational background provided them with little chance of succeeding in college by eliminating a year of their athletic eligibility (Morgan, 2005). This action coincided with the formation of the Knight Foundation Commission on Intercollegiate Athletics in 1989. The goal of the Commission was to recommend a reform agenda that emphasized academic values in an arena where commercialization of college sports often overshadowed the underlying goals of higher education (Knight Commission, 2007).

In 1995, the NCAA implemented a more restrictive set of initial eligibility guidelines known as Proposition 16. These guidelines set a sliding scale for incoming freshman student-athletes that combined a minimum GPA in thirteen (13) core high school courses with ACT or SAT scores. To qualify for athletic eligibility, student-athletes were required to have a 2.0 GPA and a SAT score of 1010 or an ACT sub score sum of 86. Student-athletes with lower standardized test scores were required to have higher core grade point averages. The minimum required standardized test score was 820 on the SAT or 68 on the ACT (NCAA, 1998). By providing institutions of higher

education an opportunity to deny admission to prospective student-athletes whose academic background was deemed inadequate, Propositions 48 and 16 assumed traditional academic variables would accurately predict collegiate academic success.

Statement of the Problem

The enactment of the NCAA's initial eligibility standards for prospective student-athletes, based solely on traditional academic variables, has gained increased attention. The academic performance of collegiate student-athletes continues to receive a great deal of attention in the literature and the media (Gaston-Gayles, 2004). Poor academic performances and low graduation rates associated with student-athletes have warranted much inquiry of predictors of academic achievement for this population (Carodine, Murphy, Orbach, Rulka, Frehlich, & Barba, 1999).

According to Zheng, Saunders, Shelley, and Whalen (2002), cognitive variables such as high school grade point average, class rank, and standardized test scores are the leading measures used to predict college performance. Therefore, based on the attention given to the academic performance of student-athletes and the use of cognitive variables for university admission, NCAA initial eligibility, and the prediction of college performance, the researcher realized a need to investigate the effect of selected academic variables as predictors of academic success.

Research Question and Hypotheses

The major research question has been developed which is significant to the purpose of this study. It is:

1. With what degree of effectiveness can selected academic variables such as (a) High School Grade Point Average; (b) High School Rank; and (c)

Standardized Test Score predict first semester academic success for at-risk scholarship football student-athletes at the University of Missouri?

This study is designed to test the following hypotheses:

H1   High school grade point average, within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative grade point average.

H2   High school rank, within the context of the regression model, is not significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average.

H3   Standardized test score, within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average.

Purpose of the Study

The purpose of this study was to identify selected academic variables that may serve as predictors of first semester academic success of at-risk scholarship football student-athletes who matriculated at the University of Missouri during the academic years 2002-03, 2003-04, and 2004-05.

Definition of Terms

The following terms used by the researcher in this study were defined as follows:

Grade Point Average – grade point average as listed on the

official transcripts according to the Office of the University Registrar. GPA is calculated by dividing the quality points earned by the number of credit hours attempted. Classes for which letter grades of A, B, C, D, and F are recorded count toward earned quality points and GPA.

A = 4 quality points   D = 1 quality point

B = 3 quality points   F = 0 quality points

C = 2 quality points

High School Grade Point Average – grade point average of thirteen (13) core subjects as required by the NCAA according to the Office of the University Registrar.

Standardized Test Score – a student's composite score on the American College Test (ACT) according to the official records of the Office of the University Registrar.

High School Rank – represents the academic rank of a high school graduate expressed in percentages, revealing the percentage of students in the class having a lower grade point average as listed on the official transcripts according to the Office of the University Registrar.

Academic Success – a grade point average of 2.0 and above at the conclusion of a student's first semester of college.

Student-Athlete – any student who was listed as receiving athletically based financial aid participating in the sport of football according to the official records of the Office of the University Registrar.

At-Risk Student-Athlete – refers to those scholarship student-athletes participating in the sport of football who were admitted through the special admission policy.

Freshman – refers to those student-athletes who upon completion of high school entered the University of Missouri as their first institution of higher learning.

Academic Variables – defined as those variables traditionally used in university admission processes to predict success in college. For purposes of this study, these variables are identified as high school grade point average, high school rank, and standardized test score.

<p align="center">Significance of the Study</p>

This study has important implications for any institution that participates in Division I intercollegiate athletics and regulates admission by academic variables. For the University of Missouri, a better understanding of the variables studied in this research should be beneficial, aiding in the decision making process of the admission of student-athletes who do not meet regular admission standards. This study will provide information useful in answering inquiries of university administrators, faculty, parents, and the general public regarding the academic performance of at-risk student-athletes at the University of Missouri. Additionally, identifying which variables are most associated with academic performance and success of at-risk student-athletes allows inquiries regarding academic progress, retention, and other academic issues to be addressed knowledgeably and factually.

The University of Missouri allows admission exceptions to those scholarship student-athletes who meet NCAA initial eligibility standards but who do not meet admission standards set forth by the institution. These students are placed on academic probation during their first semester of collegiate enrollment and must achieve a minimum grade point average of 2.0 or be subject to dismissal.

In 2003 the NCAA instituted a metric to measure the semester by semester academic progress of collegiate student-athletes. This metric, known as the Academic Progress Rate (APR), is calculated by allocating points for eligibility and retention for every scholarship student-athlete on a given team's roster. All intercollegiate sport teams receive a calculated APR score each year and must achieve a minimum standard based on a multi year calculation to avoid potential penalties (scholarship reduction, postseason bans, and NCAA membership restrictions). Although it is the respective sport teams that incur these penalties, an underachieving APR performance may perpetuate a negative connotation for the entire institution, both amongst its peers and the media.

The ability for institutions to better understand which academic variables can best predict academic success, which translates to eligibility and retention for student-athletes, will enable university and athletic department staff to better identify those student-athletes who will most likely be successful in the classroom. Furthermore, having research on the actual academic performance of student-athletes should help determine if mandating admissions eligibility based solely upon standardized test scores, high school rank, and high school grade point average is appropriate.

Additionally, this study will benefit the University of Missouri in its efforts to determine admission exceptions for the general student population. By understanding

which academic variables best predict academic success will allow the institution to be more inclusive of a variety of students who can contribute to the character, culture, and tradition of the institution despite their pre-college academic credentials.

<u>Background Information</u>

To foster a better understanding of the nature of this study, an overview of the history and mission of the University of Missouri and a description of its admission requirements are presented. In addition, a description of the NCAA initial-eligibility requirements for entering freshmen is presented.

The University of Missouri was founded in 1839 as the first public university west of the Mississippi River and the first state university in Thomas Jefferson's Louisiana Purchase territory (University of Missouri, 2006). In 1842 two literary societies were formed, the Union Literary and the Athenean Society. In 1849 the first course in civil engineering was taught and in 1867 the "Normal College", now the College of Education, was established, allowing for the enrollment of the University's first female students. The University of Missouri was awarded land-grant status in 1870. During these early years the university added schools of law and medicine. Intercollegiate athletics dates back to 1873 when the University of Missouri played Westminster College in the sport of baseball and in 1890 the first football team was fielded. The University of Missouri established the world's first journalism school in 1908 and three years later established the first Homecoming, a tradition adopted by colleges nationwide. Today the University of Missouri is the largest public research university in the state with an enrollment of approximately 28,000 students, offering 88 undergraduate degree programs and 154 graduate degree programs. The university is

located in Columbia, Missouri, some 120 miles east of Kansas City, Missouri and 126 miles west of St. Louis, Missouri.

Below is the mission of the University of Missouri:

Our distinct mission, as Missouri's only state-supported member of the Association of American Universities, is to provide all Missourians the benefits of a world-class research university. We are stewards and builders of a priceless state resource, a unique physical infrastructure and scholarly environment in which our tightly interlocked missions of teaching, research and service work together on behalf of all citizens. Students work side by side with some of the world's best faculty to advance the arts and humanities, the sciences, and the professions. Scholarship and teaching are daily driven by a sense of public service – the obligation to produce and disseminate knowledge that will improve the quality of life in the state, the nation and the world (University of Missouri, 2006).

Freshmen are considered for admission to the University of Missouri on the basis of a combination of high school rank and standardized test score and must meet or exceed the values displayed below:

HS CLASS RANK %	ACT	SAT
48 - 53	23	1050 - 1090
54 - 61	22	1010 – 1040
62 – 68	21	970 – 1000
69 – 77	20	930 – 960
78 – 85	19	890 – 920
86 – 93	18	840 – 880
94 – 100	17	800 - 830

Students must complete a minimum of seventeen (17) high school units (yearlong classes) in the following areas:

English: Four units, one of which may be in speech or debate; two units emphasizing composition or writing skills.

Mathematics: Four units, algebra 1 or higher.

Science: Three units (not including general science), one of which must be a lab.

Social Studies: Three units.

Foreign Language: Two units of the same language.

Fine Arts: One unit.

Students from non-ranking high schools are admitted based on academic achievement and standardized test scores. Persons who possess an ACT composite score of 24 or higher or a SAT score of 1010 or higher and have completed the required high school units meet the requirements for admission.

In addition, high school graduates who do not satisfy the regular admission requirements are reviewed by a committee within the University's Admissions Office. All applications are reviewed holistically, looking at factors such as strength of curriculum, core course grade point average, trends in the grade point average, ethnicity, first generation college student, and letters of recommendation. Each year the Director of Admissions may admit up to 10% of the first time college students as exceptions to the normal criteria. These students, who do not meet the class rank/test score requirements or core course grade point average/test score requirements, are placed on academic

probation for their first semester (University of Missouri NCAA Athletics Certification Self-Study Report, 2005).

The NCAA initial eligibility for students entering any college or university on or before August 1, 2004 was based on a minimum grade point average in thirteen (13) high school core courses and a corresponding ACT or SAT score. Table 1 shows the sliding scale used by the NCAA to determine the required high school grade point average and test score. The breakdown of core course requirements and the GPA/test score index are listed below:

English: Four units.

Mathematics: Two units, algebra 1 or higher.

Science: Two units, one of which must be a lab if offered by the high school.

English, Mathematics or Science: One additional unit.

Social Science: Two units.

Two additional units from any area above, foreign language or nondoctrinal religion/philosophy.

Table 1

NCAA Division I Core GPA/Test Score Sliding Scale

Core GPA	ACT	SAT
2.500	68	820
2.475	69	830
2.450	70	840-850
2.425	70	860
2.400	71	860
2.375	72	870
2.350	73	880
2.325	74	890
2.300	75	900
2.275	76	910
2.250	77	920
2.225	78	930
2.200	79	940
2.175	80	950
2.150	80	960
2.125	81	960
2.100	82	970
2.075	83	980
2.050	84	990
2.025	85	1000
2.000	86	1010

National Collegiate Athletic Association

Delimitations

This study was delimited to the at-risk scholarship freshmen football student-athletes who matriculated at the University of Missouri during the academic years of 2002-03, 2003-04, and 2004-05. Student-athletes who did not receive athletic related financial aid were excluded in this study due to the infrequency of their admission under the special admission program. Transfer student-athletes were not used because the admission standard for transfer students differ from the freshmen admission criteria and the pertinent high school data were not available.

Additionally, this study was delimited to the selected predictor variables of high school grade point average, high school rank, and standardized test score. These are the common variables utilized to determine admission and initial eligibility by the University of Missouri and the NCAA respectively. Any variables not specified were considered beyond the scope of this study.

The statistical analysis developed on the basis of this study was for over all prediction. No efforts were made to predict success in specific academic areas. Furthermore, efforts were not made to predict success based on coursework taken by the subjects in this study.

Limitations

The academic data for this study was limited to the academic records on file in the Office of the University Registrar at the University of Missouri.

CHAPTER II

REVIEW OF THE LITERATURE

The review of literature for the investigation focuses on five specific areas. The first area addresses the literature associated with the definition of academically at-risk students. The second area reviews the historical development of required academic standards for participation in intercollegiate athletics as determined by the NCAA. The third area addresses the literature associated with high school grade point average as a predictor of academic success. The fourth area analyzes the literature associated with standardized test scores as a predictor of academic success and the third area reviews the literature related to high school rank as a predictor of academic success.

Therefore, the literature reviewed is presented in the following format: (1) Academically At-Risk Students, (2) Historical Review of NCAA Academic Eligibility Standards, (3) High School Grade Point Average, (4) Standardized Test Score, and (5) High School Rank.

<u>Academically At-Risk Students</u>

Although much research has focused on at-risk students, inconsistency exists with respect to how these studies have defined this population of students. Definitions of at-risk students and characteristics from various studies, as described by Hewitt (2002), are included in this section.

In 1996 Pobywajlo placed at-risk students in three categories: (1) Academically at-risk, (2) Emotionally at-risk, and (3) Culturally at-risk. Academically at-risk students are those who had either a low high school grade point average, chose "easy" courses in

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high school, dropped out of high school, or possessed a learning disability that had not been treated (Pobywajlo, 1996). The emotionally at-risk student is defined as having a lack of confidence in their skills, personal problems at home, low self-esteem, and possibly substance abuse problems. Students in this category would benefit more from counselors, mentors, and peer advisors than from academic tutors or supplemental instruction (Pobywajlo, 1996). Culturally at-risk students come from a background different from that of the college they are attending. These students grew up in a culture different from that of academia. Education may not have been a family value and they may not understand what is required to be successful in college (Pobywajlo, 1996).

Waterhouse (1978) defined academically at-risk students as being "Unsure of themselves; needing success – cognitive and/or affective; needing financial assistance; needing tutoring and basic skill development; possessing minimal knowledge of career and educational opportunities and skills related to taking advantage of both; and needing to feel comfortable within the learning environment." However, one should not be misled by these characteristics because not all academically at-risk students fit such characteristics (Hewitt, 2002).

Noel et al (1985) defined academically at-risk students as those with characteristics which place them at a disadvantage compared to the majority of students who enter college with the academic skills required to be successful in college. Measurable characteristics associated with at-risk students include erratic academic performance in high school, low standardized test scores, low socioeconomic background, gender, race, and rate of persistence and withdrawal from college. Additional characteristics may include lack of motivation, low self-esteem, poor self-

concept, undefined goals, and being educationally disadvantaged (Noel, Moore, &

Carpenter, 1985). Other characteristics placing students at high risk for poor academic

performance include being a first generation college student from their family, being

educationally under prepared, being learning or physically disabled, and being

economically disadvantaged (Tinto, 1993; Colton et al, 1999).

Historically, researchers have attempted to identify at-risk students using

traditional academic measures such as high school grade point average and standardized

test score (Witherspoon et al 1999). However, several studies (Abrams & Jernigan, 1984;

Nisbet, Ruble, & Schurr, 1982; White & Sedlacek. 1986) have discovered that

educational aspirations, social integration skills, leadership potential, and positive self-

concept regarding academic aptitude predict the potential for success for at-risk students

better than traditional predictors (Hewitt, 2002).

<u>Historical Review of NCAA Academic Eligibility Standards</u>

Since its inception in 1906, the NCAA has had standards for the academic

performance of student-athletes. Although enforcement power started in the 1930's,

legislation for determining continued eligibility for athletic participation was not adopted

until 1952 (Mand, 1994). This legislation gave autonomy to each institution or

conference to determine what constituted normal degree progress. In 1959, legislation

was passed that required student-athletes to maintain an enrollment in a minimum 12

hour academic course load in order to be eligible during the competition season (Mand,

1994).

In 1964 the NCAA enacted the "1.6 rule" to predict the freshman grade point

average at a particular institution. This rule was the first attempt by the NCAA to

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establish a minimum academic entrance standard for determining eligibility to receive athletic scholarship aid (ACT & ETS, 1984). In 1971 the "1.6 rule" also became the first rule to determine freshman eligibility for athletic competition. In 1973 this rule was abolished because it was thought that the inclusion of an admissions test score was a disadvantage to minority students (ACT & ETS, 1984). This occurred at a time when college open door admissions policies and federally financed college aid programs for disadvantaged students were being expanded (Bailey, 1986).

In 1973 the "2.0 rule" replaced the "1.6 rule". This rule required that an overall high school grade point average of 2.0 be achieved by the sixth, seventh, or eighth semester by the prospective student-athlete (ACT & ETS, 1984). The 2.0 rule required only a single standard be met by all student-athletes, regardless of the institution they desired to attend. This rule reversed the NCAA's approach of requiring prospective student-athletes to demonstrate some level of predicted academic proficiency on more than one standard of measure in order to attend a particular institution (Mand, 1994). In addition to being simple and easy to enforce, the "2.0 rule" created a level playing field with regards to recruiting, regardless of the institution. Institutions with high academic standards were no longer discouraged from recruiting those student-athletes being recruited by those institutions perceived as less academically inclined (Mand, 1994).

The NCAA standardized degree progress requirements in 1982 with the creation of the "24 hour rule". This rule required that a student-athlete had to pass a minimum of 24 credit hours each year to maintain his/her athletic eligibility. In 1985 the "24 hour rule" was amended by the "satisfactory progress rule" that stated a student-athlete must satisfactorily complete a minimum of 24 credit hours each year or an average of 12 credit

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hours each term, excluding summers, of acceptable degree credit and maintain a grade point average that places the student-athlete in good academic standing. A student-athlete was also required to designate a program of study leading toward a specific degree by the beginning of the fifth semester of full time enrollment.

According to Bailey (1986), the commercialization of sports and the need for increased revenues to support expanding non-revenue sports placed undue pressure on revenue producing sports to win at many Division I institutions from 1973 – 1983. As a result, the establishment of special admissions policies for student-athletes with inadequate academic preparation was created. In time, college presidents, educators and athletic administrators became concerned with both the low standard of the 2.0 rule and the legitimacy of high school grades of prospective student-athletes. This resulted in the belief that institutions of higher learning needed to communicate a clearer message regarding academic entrance standards for athletes (ACT & ETS, 1984).

In 1983, "Proposal No. 48" was passed at the NCAA Convention as an amendment to the 2.0 rule (ACT & ETS, 1984). Placed into effect in 1986, Proposal No. 48 maintained the grade point average standard of the 2.0 rule but required that a prescribed average must be obtained in a core curriculum of eleven (11) academic subjects and reinforced a minimum test score on either the SAT or ACT. Any student-athlete who had an overall high school grade point average of 2.0 but failed to meet Proposal No. 48 was still eligible to receive an athletic scholarship but could not practice or compete during the freshman year, thus forfeiting one year of athletic eligibility (Mand, 1994).

As noted by Mand (1994), the major criticisms of Proposal 48 fell into three categories:

1. Adverse impact: The rule will disqualify proportionately more black athletes than white athletes (Sutherland, 1984).

2. Absolutism: The rule does not recognize that Division I institutions have differing academic standards (Jenkins et al, 1984).

3. Fixed minimum test scores: Since substantial research has demonstrated that using test scores in combination with high school grades is the best prediction of college grades, establishing a minimum test score requirement regardless of the high school grade point average is not appropriate (Astin, 1971; Maxey & Sawyer, 1979; Ervin et al, 1984; Sutherland, 1984; ACT & ETS, 1984).

As a result of the criticisms, a study to determine whether Proposal No. 48 needed modifications was conducted by the NCAA Presidents' Commission and the National Association for Equal Opportunity in Higher Education (Esquinas, 1985). After the findings of the study were presented to the NCAA Council in October, 1985, a proposal was drafted to phase in the requirements of Proposal No. 48 over a three-year period that included a sliding scale between high school core curriculum grade point average and standardized test scores. In 1986, this amended version of Proposal No. 48 was put into effect and became known as Bylaw 14.3.

In 1990, NCAA Bylaw 14.3 was amended and stated that entering freshmen who did not meet these initial eligibility standards could not receive athletically related financial aid nor practice or compete during the first academic year in residence. Bylaw 14.3 was further modified during the 1992 and 1993 NCAA Conventions. Effective in

1995, entering freshmen had to obtain a high school grade point average of 2.5 in a core curriculum of thirteen (13) subjects (see p. 11) to be eligible to practice, compete, and receive athletics related financial aid during the first year of collegiate enrollment. This was an increase from a 2.0 high school grade point average in an eleven (11) subject high school core curriculum. Also adopted was a new initial eligibility index, similar to the amended sliding scale of the original Proposal No. 48.

At its October, 2002 meeting, the NCAA Board of Directors voted to increase the high school core course requirement from thirteen (13) to fourteen (14). This change went into effect in August, 2005 and will be effective through the 2007 – 2008 academic year. Most recently, in April, 2003, the Board of Directors voted to increase the high school core course requirement from fourteen (14) to sixteen (16), adding one additional math course and two additional courses from the math, science, English, or social science areas to the requirements listed on page eleven (11). This increase will be effective August, 2008 for students entering any Division I college or university on or after August 1, 2008.

High School Grade Point Average

Academic achievement measures such as high school grade point average and test scores are used to predict whether applicants will be successful in the college classroom (Noble and Sawyer, 2004). In addition to measuring educational achievement, high school grade point average includes other personal characteristics such as effort, attendance, conformity, and motivation (Goldman and Widawski, 1976; Stiggins, Frisbie, and Griswald, 1989). As a result, high school grade point average likely relates to both

the cognitive and the noncognitive components of college academic success (Noble and Sawyer, 2004).

Zheng, Saunders, and Shelley (2002) investigated alternative predictors of academic success for freshmen residence hall students. Using high school grade point average as the only cognitive variable, results showed a substantial gain in explained variance when grade point average was added to the noncognitive variables of student background characteristics, attitudinal traits, and environment. High school grade point average added 28.5 percentage points of explained variance when combined with background traits and 15.9 percentage points over what was explained by the background and attitudinal variables without high school performance. Finally, Zheng et al (2002) found that incorporating high school grade point average together with the background, attitudinal, and environmental variables explained 40.2% of the variance in first-year college grade point average, 16.1 percentage points more than explained by the entire set of variables without high school grade point average.

In a thirteen-year study to assess the incremental effectiveness of the SAT exam for admission to units of the University System of Georgia, Fincher (1986) reported that the single best predictor of college grades was a student's high school grades. The researcher wrote:

High school average continues to be the largest, single contributor to the prediction of grade point average because the examining and grading practices of high school and college faculty are, in all probability, similar in structure and function. Both are forms of human judgment and both reflect human errors that are similar in their subjectivity and inconsistencies. Neither high school teachers

nor college faculty receive a great deal of pre-service or in-service assistance in

the assessment of student learning. (p.74)

Fincher affirmed what other studies reported in that high school grade point average

stands out as the primary means of predicting college grades.

Astin (1971), in a study with a sample of 36,581 students, reported that the

correlations between high school grade point average and freshman grade point average

were .51 and .52 for men and women respectively, while the correlations between

freshman grade point average and aptitude test scores were .35 and .43. Astin concluded

that "of all the information available about the high school student, his record of

academic performance is the best single indicator of how well he will do in college."

In 1984, Nettles found that high school grade point average was a significant

predictor of college persistence for black students, which was supported in 1986 when

Allen found high school grade point average to be the strongest predictor of college

grades for black students on both predominantly black and predominantly white

campuses. Other studies of high school grade point average have indicated that grade

point average provided one of the best predictors for white students' college academic

status but was less effective in predicting academic performance for black students

(Sedlacek and Adams-Gaston, 1989; Thomas and Stanley, 1969).

Walter, Smith, Hoey, Wilhelm, and Miller (1987) found that high school grade

point average accounted for 20% of the variance in college grade point average for black

student-athletes and 15% for non-black student-athletes amongst a midwestern

university's football program. In 1992, Young and Sowa sampled black student-athletes

who were admitted as freshmen between fall 1984 and fall 1988 at a predominately

White NCAA Division I university. Including both scholarship and nonscholarship student-athletes in nineteen (19) intercollegiate sports, they found among the cognitive variables studied, only high school grade point average provided a statistically significant correlation to first semester college grade point average. Sellers (1992) found high school grade point average and mother's occupation were the only significant predictors of college grade point average for black student-athletes participating in revenue sports while high school grade point average, socioeconomic status, and SAT scores were significant predictors of college grade point average for white student-athletes.

Zwick and Sklar (2005) studied the predictive validity of high school grades and SAT scores for first-year college grade point average and degree completion among four groups: Hispanic students whose first language was Spanish and Hispanic, black, and white students whose first language was English. Survival analysis showed that high school grade point average had a statistically significant influence on graduation in the white/English group. Using a linear regression analysis, they found high school grade point average to be a stronger predictor of first-year college grade point average for all students combined, than SAT score. When analyzing prediction error, Zwick and Sklar reported that over prediction of first-year college grade point average among students in the black/English and Hispanic/English groups was more pronounced when only high school grade point average was used as a predictor. This finding argues against the use of high school grades as the sole predictor of college performance. High school grade point average had a statistically significant influence on graduation in the white/English group, associating higher high school grades with a higher probability of graduation.

Ramist et al (1994) found that high school grade point average, along with SAT Verbal scores, were more effective as predictors of first-year college achievement for students who reported English as their best language. In a study of ten (10) student groups in each of two freshman cohorts at the University of California, Santa Barbara, Zwick and Schlemer (2004) discovered results that were somewhat inconsistent. For students whose first language was not English, SAT Verbal score was in some cases a better predictor of first-year college grade point average than was SAT Math score or high school grade point average. In other cases, high school grade point average was the best predictor.

<div align="center">Standardized Test Score</div>

Many institutions rely heavily on the Scholastic Aptitude Test (SAT) or American College Test (ACT) to assist in the evaluation of students for admission (Morgan, 2005). According to Astin (1992), standardized tests provide an inexpensive quantitative index that facilitates the admission process. Students who achieve higher scores on the SAT or ACT are preferred over those with lower scores because it is hypothesized they will be more successful in college (Morgan, 2005).

The Educational Testing Service (ETS) justifies the use of the SAT in college admissions stating it increases the accuracy of predicting freshman college grades over the high school record alone (Test Use and Validity, 1980). According to Trusheim and Crouse (1984), ETS found that the SAT increased the validity coefficient for equations based solely on high school grade point averages from 0.50 to 0.58. A study at Washington College substantiated that the SAT increases the predictive validity of

freshman performance, however, it was a poor predictor of admission decisions compared with the high school record (Crouse and Trusheim, 1984).

Caroline Hodges Persell, in her book *Education and Inequalities*, states "considerable evidence refutes the predictive validity of…aptitude testing." Other research has shown that SAT scores are valid predictors of academic performance for only the first year of college while still additional research has found these scores to explain less than half of the variance in first-year college grades (Willie, 1985).

Both the College Board and ACT advise against making admissions decisions based solely on a single measure such as a test score (ACT, 1997; College Board, 2003). In a study conducted at the University of Pennsylvania, Baron and Norman (1992) found that while SAT added significantly to the prediction of grades in some individual courses, it did not add significantly to overall student performance. However, they found that combined with high school rank, achievement test scores did add significantly to the predictive power of the equation. Ferrari and Parker (1992) found that SAT scores were related to college class rank and that high school performance was not a significant predictor of college achievement. In 1999, Betts and Morrell found that both SAT scores and high school grade point average were significant predictors of college grade point average.

Researchers at Chicago State University investigated the ability of the ACT to predict college academic performance. The test explained only 3.6 percent of the differences in cumulative college grade point average for a majority of the university's graduates who had mid-range test scores (Paszczyk, 1994). According to Sellers (1992), SAT and ACT scores are often unrelated to college grade point average.

Cueso (1994) contended that the predictive validity of standardized admission tests, such as the ACT and SAT, has been overestimated. He suggested that the best overall measure of college academic success is high school grade point average, based on his review of key research findings. According to Cueso, standardized admissions tests prove to be weak in dealing with certain subgroups such as females and ethnic minorities and for certain colleges and universities.

Kanoy, Wester, and Latta (1989) found that SAT scores added little to high school grade point average as predictors when assessing the use of traditional, cognitive, and psychological measures in predicting academic achievement of seventy female freshmen. The authors wrote "admissions committees could do a more accurate job by collecting data only on high school GPA and academic self-concept rather than on measures such as SAT scores."

The SAT and ACT have been shown to correlate fairly well with freshman grades for white students in general, while having a lower correlation for non-white and nontraditional students (Sedlacek, 1987, 1989; Tracey and Sedlacek, 1984, 1985, 1987, 1988, 1989; White and Sedlacek, 1986). In a study of 40 female and 84 male specially admitted White freshmen at a state university in the Midwest, ACT scores, along with high school rank, were the most effective overall predictors of first-year college academic success (Ting, 1997). This finding confirms Houston's (1980) study in which SAT scores and high school rank together were the best predictors of first-year college grades for specially admitted students. In a study of first generation college students enrolled at a large Midwestern university, Naumann, Bandalos, and Gutkin (2003) found ACT scores to be a valid predictor of college GPA.

Young (2004) found SAT validity to be somewhat smaller for black and Latino students than for white students when correlating test scores with first-year college grade point average. In another study, conducted at Wake Forest University, Lawlor, Richman, and Richman (1997) assessed the unbiased validity of SAT scores as a predictive measure of college performance for African-American and European-American students who enrolled in 1990 and who graduated in 1994. The African-American students scored an average of 80 points lower on the SAT than European-American students but the two groups' college grade point average failed to differ. This finding suggested that the SAT was a biased predictor of student performance in college.

There has been an increased interest in the relationship between academic performance and athletic participation of student-athletes. Ervin, Saunders, Gillis, and Hogrebe (1985) studied the academic performance of student-athletes in revenue producing sports enrolled in a developmental program designed for under prepared freshman at a Division I institution. Their study suggested that SAT scores are significantly related to the number of academic courses taken in high school, the grade point average for developmental college courses, and the amount of time required of student-athletes to spend in remedial course. Additionally, it was found that the more academic courses students take in high school, the better prepared they are for college coursework.

At the University of Utah, Baumann and Henschen (1986) studied the relationship between ACT score and college grade point average for 753 male and female student-athletes. When combined with high school grade point average, ACT score was the best predictor of actual college grade point average for the overall group. ACT did not

enhance the predictability of academic success for non-white student-athletes but did so for the white student-athletes. When high school grade point average was used alone, the college academic performance of minority students predicted better. This indicated ACT score was not a good predictor for minority student-athletes in this study.

Walter, Smith, Hoey, Wilhelm, and Miller (1987) discovered that SAT scores and high school grade point average account for less than 20% of the variance in the grade point averages of college football players and are minimal predictors of graduation. Petrie (1993) found that ACT scores were unrelated to the college academic performance of minority football players. Sedlacek and Adams-Gaston (1992) reported in a study of both cognitive and noncognitive variables associated with first semester college grade point average that SAT score was unrelated to grade point averages. Another study by Petrie and Stoever (1997) reviewed the effects of academic and nonacademic variables on college grade point averages for freshmen and upper level female student-athletes at twelve (12) different NCAA Division I universities. SAT scores were consistently related to better academic performances across the two groups. For the freshmen student-athletes, SAT scores accounted for 29% to 31% of the grade point average variance. For the upper level student-athletes, SAT scores accounted for only 10% to 16% of the grade point average variance. This difference is deemed reasonable because SAT score should be a better predictor of initial college grades.

In a study that examined the academic performance of football student-athletes at a predominantly white university in the Midwest, Petrie (1993) found that ACT scores were not related to first semester college grade point average for African American football players. ACT accounted for only 10% of the variance for white student-athletes.

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Petrie and Russell (1995) investigated the effects of both academic and

psychosocial variables on the academic performance of minority and nonminority college

football players from two major public universities. For minority athletes, ACT score

was weakly related to fall semester grade point average and not related to nonminority

performance. This finding is interesting given that generally, ACT and SAT scores have

been found to be better predictors of college grade point averages for non-minority

student-athletes as opposed to their minority counterparts (Walter et al, 1987).

<u>High School Rank</u>

While standardized test scores (ACT and SAT) are comparable since

all students take the same examinations, high school ranks are dependent on the quality

of the high school (Tam and Sukhatme, 2004). More competitive high schools make it

difficult for students to achieve a high percentile rank.

In a study used to estimate first-year college academic success for specially

admitted white students, Ting (1997) found high school rank and ACT scores to be the

overall most effective predictors. The researcher combined cognitive and psychosocial

predictors in an effort to predict the academic performance of 40 female and 84 male

specially admitted white freshmen at a state university in a rural area of the Midwest.

Psychosocial variables included successful leadership experiences, preference for long-

range goals, acquired knowledge in a field, and a strong support person. Cognitive

variables included high school class rank and ACT scores. While the psychosocial

variables were significantly related to grade point average, the cognitive variables, ACT

scores and high school rank, were also consistently related to grade point average in the

first year. The preliminary regression analysis revealed high school rank, ACT

composite, ACT Verbal, successful leadership experiences, and demonstrated community service to be the most effective predictors. The findings of this study indicate both cognitive and psychosocial variables are important in predicting academic performance of specially admitted white students.

Baron and Norman (1992) asked how well students' grades at the University of Pennsylvania could be predicted from linear combinations of high school rank, SAT score, and average achievement test score. The main analysis was based on 3,816 students who entered the University as freshmen in the fall of 1983 and 1984. Although all three predictors correlated with cumulative college grade point average, high school rank was the best single predictor. The results of this study strengthened the conclusion of Crouse and Trusheim (1988) that SAT makes a relatively small contribution to prediction. The SAT scores have less incremental validity when high school class rank and achievement tests are known.

In an effort to establish a prediction equation for first semester college grade point average for one hundred (100) freshmen students entering a small public university, Thornell and Jones (1986) used ACT scores and high school rank percentiles as predictor variables. Using a multiple regression procedure to establish significance levels of the predictor variables, the researchers found that both ACT scores and high school rank percentile correlated significantly with first semester college grade point average. Thornell and Jones concluded that high school rank percentile was the best predictor.

According to a report published by the Colorado Commission on Higher Education (1992), high school rank was declared the most significant indicator of student success in college. The report stated "nationally students who rank in the uppermost high

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school quartile are three times more likely to graduate from college than those in the lowest high school quartile."

One study sponsored by the U.S. Department of Education looked at the value of class rank, high school grade point average, test scores, and course rigor in predicting the attainment of a bachelor's degree. High school rank offered a correlation with bachelor's degree attainment of .44 compared to rigor of courses (.54), SAT scores (.48), and high school grade point average (.44) (Adelman, 1999). These results demonstrate the value of incorporating broader admission criteria than just a test score/high school rank/grade point average index when trying to forecast college performance.

Ting (1998) looked at both psychosocial and traditional college admission variables in a study of 54 first generation students in a Midwest public university. He found high school rank, along with successful leadership experience and community service, explained a majority of the variance in predicting first-year college grade point average. The psychosocial variables played a larger role in the explained variance.

When striving to ensure non-biased admissions, determining the strongest predictive measures for all students is an important factor to consider (Lawlor, Richman, and Richman, 1997). Lawlor et al tested the unbiased validity of the use of the SAT as a predictive measure of college performance for black and white students who entered in 1990 and who graduated from Wake Forest University in 1994. The purpose of the study was to determine if the SAT contributes as an unbiased predictor of college performance and to discover the strongest assessments of a future applicant's success in college (Lawlor et al, 1997). High school rank, high school grade point average, and SAT scores were examined. Using a stepwise multiple regression analysis to assess the relationship

between the predictor variables on the criterion variables, the researchers discovered high school grade point average was the strongest predictor of college grade point average and college class rank for white students. When analyzed with SAT score and high school rank, SAT Verbal score was the strongest correlate of black student performance.

High school rank has proved to be a more inclusive determinant than SAT score for minority student college admission (Lawlor et al, 1997). When SAT score is added to the high school rank, predicted freshmen grade point average for black students is often lowered below a college's admission cut off (Lawlor et al, 1997). Crouse and Trusheim (1988) found that a higher percentage of black students, as opposed to white students, are admitted by high school rank but rejected by high school rank plus SAT score (19% versus 4.8%). Problems with using only high school rank as the sole criteria for college admission arise because different class sizes and a student's choice of courses relates to the potential of a student to attain their respective high school grade point average and class rank (Lawlor et al, 1997).

Young and Sowa (1992), studied the use of noncognitive variables (positive self concept, self-appraisal, ability to deal with and understand racism, long term goals, support for academic goals, leadership, community service, and knowledge) with cognitive variables (high school rank, high school grade point average, semester college grade point average, semester course credits earned, cumulative course credits earned, and SAT scores) in predicting college academic success for black student-athletes. The researchers discovered high school rank and high school grade point average had negative correlations, indicating higher high school rank and higher high school grade point average correlate to higher college grade point average and more credits earned.

High school rank and the noncognitive variable knowledge were found to be significant correlates with year two (2) cumulative grade point average. High school rank was significantly correlated with credits earned in semesters one (1), three (3), and four (4) and for the end of year two (2). High school rank did not provide a statistically significant correlation to first semester college grade point average. This study questions the use of cognitive variables alone to determine NCAA Division I freshman athletic eligibility based on the inconsistency of these variables in predicting college grade point average.

Summary

The literature related to the use of traditional academic variables to predict college academic performance is varied. There is as much research to conclude that the variables of high school grade point average, standardized test score, and high school rank are effective as predictors of collegiate academic performance as there is that they are ineffective.

High school grade point average appears to be effective in predicting the success of white students, but when used alone, less effective in predicting the academic performance of black students. However, coupled with non-cognitive or psychosocial variables, high school grade point average has appeared to be a strong predictor of college grade point average for students across various ethnic backgrounds. Research conducted on student-athletes has shown high school grade point average to provide a statistically significant correlation to first-semester college grade point average while high school grade point average along with non-cognitive variables are significant predictors of college grade point average for Black student-athletes. High school grade

point average and SAT score have been found to be a significant predictor for white student-athletes. Although, high school grade point average alone appears to predict student-athletes' college grade point average more consistently than standardized test scores, this being especially true for minorities.

The literature on the use of ACT/SAT scores as predictors of college academic performance is not without criticism. Research has shown that standardized tests do not predict well for minorities and that they have been found to be unrelated to college grade point average. However, enough evidence has been found to suggest these measures are valid predictors for the admission of students to colleges and universities.

High school rank has been analyzed in several studies as a predictor variable in attempting to predict academic achievement for college students. Although dependent on the quality of high school, the review of literature found that high school rank is a more inclusive determinant than other traditional variables for minority student college admission. Additionally, studies have determined that high school rank allowed for a higher percentage of black student college enrollment compared to using both high school rank and test score in the same admission decisions. Other research has concluded that high school rank correlates to higher college grade point average but is not a statistically significant correlate to first semester grade point average.

The research of traditional academic variables, as they relate to the prediction of college academic performance, should be examined carefully in order to make reliable comparisons between various groups of students (Morgan, 2005). Although traditional academic variables provide quantitative indexes that facilitate admission processes, allow for prediction of academic achievement, and regulate NCAA initial eligibility, the

literature acknowledges inconsistencies that occur on various levels within various student populations to include student-athletes.

This review of literature has raised questions about the usefulness of traditional academic variables in predicting college academic success for at-risk student-athletes. Thus, it is appropriate to research these variables which are used by the University of Missouri and the National Collegiate Athletic Association when determining admission and initial eligibility for student-athletes.

CHAPTER III

METHODOLOGY

The purpose of this study was to identify selected academic variables of academic achievement which account for the majority of the variance in first semester grade point average of at-risk scholarship football student-athletes attending the University of Missouri. The institution, the selected population, data collection procedures, and the description of statistical design are examined in this chapter.

University of Missouri

The University of Missouri, a land grant university, is the flagship institution of higher education in Missouri. Founded in 1839, the University of Missouri offers eighty-eight (88) undergraduate degree programs, ninety-two (92) master's degree programs, and sixty-two (62) doctoral degrees to approximately 28,000 students.

Admission decisions for freshmen are based on academic achievement measures, used to predict whether applicants will be successful in college. The University of Missouri considers factors such as a students' high school record, with a special emphasis on scores on either the ACT or SAT and high school rank. Scholarship student-athletes are admitted to the university by either meeting the regular admission requirements or the initial eligibility requirements set forth by the NCAA. Scholarship student-athletes who fail to meet the institutional requirements but meet the NCAA requirements are admitted under the institution's special admissions program.

The University of Missouri is a NCAA Division I institution and a member of the Big 12 Conference. The following sports are sponsored by the University of Missouri

Department of Intercollegiate Athletics: football, men's and women's basketball, baseball, softball, women's tennis, women's soccer, women's gymnastics, men's and women's swimming and diving, wrestling, volleyball, men's and women's track and field, men's and women's cross country, and men's and women's golf. The University of Missouri's athletic department operates with a budget of approximately forty-four (44) million dollars and has fielded nationally competitive teams in most of its sports. A total of sixteen (16) of the university's twenty (20) sport programs participated in NCAA post season competition in 2005-06.

Student-athletes at the University of Missouri receive support services from the athletic department's Total Person Program. The primary goal of the Total Person Program is to provide and coordinate academic support services and life skills programming to approximately five hundred (500) student-athletes.

The academic support services provided by the Total Person Program include academic counseling and advising, tutorial services, supervised study hall, academic mentoring, and a computer lab. Life skills programming includes career counseling, personal and social development, and community service and outreach. Organizationally, the Total Person Program reports to the Department of Athletics, which provides all necessary funding. The administration of the program is the responsibility of a Director of Academic Services and a Director of Life Skills, both whom report to an Associate Director of Athletics for Student Services.

<u>Population and Sampling</u>

The subjects for this study were scholarship football student-athletes admitted under the University of Missouri's special admission program who matriculated at the

institution during the academic years 2002-03, 2003-04, and 2004-05. The population pool of student-athletes was taken from the admission files of the University of Missouri Office of the Registrar.

The sample represented a total of forty-nine (49) scholarship student-athletes. In addition to being specially admitted, the entire group of student-athletes met certain criteria which included being on athletics related financial aid, being on the football team roster at the start of classes for the respective fall semester, being enrolled in a minimum of twelve (12) credit hours, and being classified as regular degree seeking students.

Collection of Data

Data used in this study for the prediction of academic success of this group were obtained from the University of Missouri's Office of the Registrar. These data included high school grade point average, high school rank, ACT composite score, SAT total score, and first semester college grade point average. For purposes of this study, all SAT total scores were converted to the ACT composite equivalent using the conversion table shown in Appendix A.

Variables

The dependent variable is first semester college grade point average. Although using grade point average has limits, the researcher chose this cognitive measure as it is used by the institution as the criteria for determining enrollment continuance for the special admission population. The independent variables were high school grade point average, high school rank, and standardized test score. These cognitive variables provide descriptive data on the entry level academic ability of the student-athletes. The high school grade point average and the ACT composite scores have been shown to be useful

when assessing academic ability of prospective college students (Willingham and Breland, 1982). Additionally, these variables are important to this study because ACT composite and high school rank are used by the University of Missouri when making admission decisions and high school grade point average and ACT composite are used by the NCAA to determine initial eligibility.

<u>Description of Statistical Design</u>

In a study of this type, it was possible that multiple variables might be correlated with the first semester academic success of the at-risk scholarship football student-athlete. As a result, it was decided that a statistical design would have to be used which would allow various factors to co-vary simultaneously. The most appropriate statistical model for this study was a stepwise multiple regression model.

This model made it possible to statistically analyze each of the variables as they relate to the criterion and each other. The stepwise multiple regression analysis used was from the Statistical Package for the Social Sciences to test the following hypotheses:

H1   High school grade point average, within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative grade point average.

H2   High school rank, within the context of the regression model, is not significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average.

H3   Standardized test score, within the context of the regression model, is significant

as a predictor of first semester academic performance of at-risk scholarship

football student-athletes as measured by cumulative college grade point average.

A stepwise multiple regression analysis was used to test distinct prediction

models. An assumption in stepwise regression analysis is that the relationship between

each predictor variable and the outcome measure is linear across all values of the

outcome. For the analysis the size of the group (n) is shown.

High school grade point average was entered first. High school rank was then

added to the equation followed by ACT composite to determine the best overall model

for predicting first semester college grade point average. All hypotheses were tested by

stepwise multiple regression analyses. The $p < .05$ rejection level was used to test all

hypotheses.

CHAPTER IV

RESULTS

The purpose of this study was to identify selected academic variables which might explain the variance in the first semester academic performance of at-risk scholarship football student-athletes at the University of Missouri. The academic variables of (a) High School Grade Point Average, (b) High School Rank, and (c) Standardized Test Score were examined in relation to actual academic performance in college, as measured by cumulative college grade point average at the end of the first semester of initial full time enrollment. The results of all the statistical analysis of this study, with reference to pertinent tables, are described in this chapter.

Three hypotheses were tested and one research question guided this study:

H1   High school grade point average, within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative grade point average.

H2   High school rank, within the context of the regression model, is not significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average.

H3   Standardized test score, within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average.

Q1   With what degree of effectiveness can selected academic variables such as (a) High School Grade Point Average; (b) High School Rank; and (c) Standardized Test Score predict first semester academic success for at-risk scholarship football student-athletes at the University of Missouri?

The results of the investigation are reported in the following sub-sections in this chapter: (1) a profile of the population studied, (2) descriptive analysis, (3) analysis of academic performance predictor variables used in this study, and (4) description of results for each hypothesis tested. A description of variable abbreviations used throughout this chapter are shown in Table 2.

Table 2

Description of Variable Abbreviations Used

Variables	Abbreviation
Independent Variables:	
High school grade point average	HSGPA
High school rank	HSR
American College Test Composite Score	ACTC
Criterion Variable:	
First semester MU grade point average	MUGPA

Demographic data for the student-athlete population in this study are shown in

Table 3. The group consisted of forty-nine (49) male scholarship football student-

athletes, of which twenty-one (21) were white and twenty-six (26) were black. The

ethnicity of two subjects was not available. Ethnicity was not used as an independent

variable in this study because it is not utilized by the University of Missouri or the NCAA

to determine admission or initial eligibility respectively. However, the researcher

included this information for the benefit of the reader. This data set contains full-time

degree seeking undergraduate students only and each subject was admitted to the

University of Missouri under the institution's special admission program during the

academic years 2002-03, 2003-04, and 2004-05.

Table 3

Student-Athlete Population Profile

	N	%
Population	49	100%
Gender		
Male	49	100%
Race		
White	21	43%
Black	26	53%
NA	2	4%

NA = not available

Descriptive Analysis

Table 4 shows means and standard deviations of the criteria variable; first semester college grade point average, and the predictor variables; high school grade point average, high school rank, and ACT composite.

Students entered under the University of Missouri's special admission program must achieve a minimum grade point average of 2.0 at the end of their first semester of enrollment or be subject to dismissal. The mean for the population examined exceeded that; their mean college grade point average was 2.18. Thirty-three (33) student-athletes achieved a first semester grade point average above a 2.0 while sixteen (16) of the forty-nine (49) student-athletes within the sample population earned a first semester grade point average below a 2.0.

The mean scores of each independent variable were as follows: (1) high school GPA = 2.751; (2) high school rank = 42.863; and (3) ACT composite = 18.489.

Table 4

Means and Standard Deviation of Criteria and Predictor Variables

Variable	N	Mean	SD
MUGPA	49	2.183	0.614
HSGPA	49	2.751	0.399
HSR	49	42.863	17.783
ACTC	49	18.489	2.622

Analysis of Academic Performance Predictor Variables

To predict the first semester cumulative college grade point average of at-risk scholarship football student-athletes, a stepwise multiple regression analysis was performed using the predictor variables of high school grade point average, high school rank, and ACT composite score.

Table 5 displays a bivariate correlation matrix among the criterion and predictor variables used in the study and shows the correlation coefficient (r) associated with each other. Two of the three predictor variables analyzed, high school grade point average and high school rank, were significantly correlated to first semester college grade point average. High school grade point average had a modest correlation with first semester college grade point average ($r = .486$). High school rank had a low correlation with first semester college grade point average ($r = .399$) and ACT composite had a low negative correlation coefficient with first semester college grade point average ($r = -.204$).

Table 5

Correlation Matrix of Criterion and Predictor Variables for Academic Success Prediction (n = 49)

Variables	MUGPA	HSGPA	HSR	ACTC
MUGPA	1.00	.486*	.399*	-.204
HSGPA		1.00	.695*	-.389*
HSR			1.00	-.447*
ACTC				1.00

* $p < .01$

Although not identified as predictor variables in this study, the researcher did analyze the correlation between ACT English and ACT Math scores of the sample population and the criterion variable. Neither variable was significantly correlated to first semester grade point average which may be explained by their high correlations with ACT composite. A correlation table that includes ACT English and ACT Math scores is shown in Appendix B.

Table 6 displays a bivariate correlation matrix among the predictor variables used in the study and shows the correlation coefficient (r) associated with each other. High school grade point average and high school rank had the highest significant correlation coefficient between predictor variables ($r = .695$). High school grade point average and ACT composite had a low negative correlation coefficient ($r = -.389$) while high school rank and ACT composite had a moderate negative correlation coefficient ($r = -.447$). Both were significant at the .01 level.

Table 6

Correlation Matrix of Predictor Variables for Academic Success Prediction
(n = 49)

Variables	HSGPA	HSR	ACTC
HSGPA	1.00	.695*	-.389*
HSR		1.00	-.447*
ACTC			1.00

* $p < .01$

All variables used in the bivariate correlation matrix were used to determine if any combination of variables could predict first semester college grade point averages in the sample. A stepwise multiple regression analysis was conducted.

Step 1 analyzed the predictor variable of high school grade point average and its importance in predicting first semester college grade point average. Step 2 analyzed high school grade point average in addition to high school rank in predicting first semester college grade point average for the student-athlete sample. Step 3 analyzed the variables of step 2 in addition to ACT composite.

The predictor variables and their importance in predicting the first semester college grade point average of at-risk scholarship football student-athletes are presented in Table 7. Only high school grade point average was significant as a traditional predictor of the first semester college grade point average, $F (1, 41) = 10.968$, p < .005, $R^2 = .211$, accounting for 21% of the variance in Model 1. In Model 2, a slight change in variance occurred from Model 1 (21% to 22%) when high school rank was included, $F (2, 40) = 5.732$, p > .005, $R^2 = .223$. High school grade point average did not remain significant as a predictor of first semester college grade point average. The inclusion of ACT composite score in Model 3 caused no change in the predictive power of Model 2 (22% to 22%), $F (3, 39) = 3.730$, p > .005, $R^2 = .223$. None of the predictor variables added significantly to the prediction of first semester college grade point average. The r-square value for the combination of high school grade point average, high school rank, and ACT composite was .223.

Table 7 shows that between the three traditional predictor variables (high school grade point average, high school rank, and ACT composite), only high school grade point

average is significant. High school grade point average accounted for 21% of the variance of first semester college grade point average for the at-risk scholarship football student-athletes. High school rank and ACT composite were not significant as predictors of first semester grade point average for this sample.

Table 7

Stepwise Regression Analysis of First Semester College GPA for At-Risk Scholarship Football Student-Athletes (n = 49)

Variable	R^2	Unstandardized Coefficients Std Error		Standardized Coefficients Beta
		B	SE B	B
Model 1				
HSGPA	.21	.745	.225	.459*
Model 2				
HSGPA	.21	.573	.317	.353
HSR	.22	.005	.007	.151
Model 3				
HSGPA	.21	.568	.324	.350
HSR	.22	.005	.007	.146
ACTC	.22	-.004	.037	-.016

* p < .05

Table 8 presents the results of the stepwise regression analyses of the predictor variables of academic performance for the sample population as measured by the first semester cumulative grade point average. High school grade point average was the only variable to show a significant (R^2) increment. The R^2 value suggested that 21% of the variance in first semester college grade point average could be explained by this variable.

Table 8

Stepwise Regression Analyses Summary Table of Predictor Variables of First Semester College GPA for At-Risk Scholarship Football Student-Athletes (n = 49)

Variable	R	R^2	R^2 Change	F	Sig. of F
HSGPA	.459	.211	.211	10.968	.002*
HSR	.472	.223	.012	5.732	.443
ACTC	.472	.223	.000	3.730	.922

* $p < .05$

Test of the Hypotheses

Hypothesis 1

The first hypothesis investigated the effectiveness of high school grade point average as a predictor of academic performance of at-risk scholarship football student-athletes. The hypothesis stated that high school grade point average, within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative grade point average. Table 5 indicates high school grade point average as a single predictor variable of academic performance had the highest correlation ($r = .486$) but a modest association with first semester cumulative grade point average and was significant at the .01 level. Additionally, Table 8 shows that high school grade point average had the highest value of explained variance ($R^2 = .211$) and suggests that 21% of the variance in first semester cumulative college grade point average was predicted from the high school grade point average. Based on the findings from the data presented, this hypothesis was accepted.

Hypothesis 2

The second hypothesis investigated the effectiveness of high school rank as a predictor of academic performance of at-risk scholarship football student-athletes. The hypothesis stated that high school rank, within the context of the regression model, is not significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average. Table 5 indicates high school rank as a single predictor variable of academic performance had a low to moderate correlation ($r = .399$) with first semester cumulative grade point average.

Although high school rank correlated significantly with first semester cumulative college grade point average at the .01 level, Table 8 shows that high school rank explained 1% of the variance ($R^2 = .012$), and based on the findings from the data presented, this hypothesis was accepted.

Hypothesis 3

The third hypothesis investigated the effectiveness of ACT composite as a predictor of academic performance of at-risk scholarship football student-athletes. The hypothesis stated that standardized test score (ACT composite), within the context of the regression model, is significant as a predictor of first semester academic performance of at-risk scholarship football student-athletes as measured by cumulative college grade point average. Table 5 indicates ACT composite as a single predictor variable of academic performance had a low negative correlation ($r = -.204$) with first semester cumulative grade point average and was not significant at the .01 level. Table 8 shows that ACT composite explained 0% of the variance in first semester college grade point average ($R^2 = .000$), and based on the findings from the data presented, this hypothesis was rejected.

<u>Summary</u>

The academic variables of (a) High School Grade Point Average, (b) High School Rank, and (c) Standardized Test Score (ACT composite) were examined in relation to actual academic performance in college, as measured by first semester grade point average for forty-nine (49) at-risk scholarship football student-athletes at the University of Missouri. The purpose of the study was to identify which traditional variables might explain the variance in the first semester academic performance for this sample.

High school grade point average and high school rank significantly correlated with first semester college grade point average while ACT composite did not. Between the independent variables, high school grade point average and high school rank had a significantly high correlation. High school grade point average and ACT composite had a significantly low correlation as did high school rank and ACT composite.

A stepwise multiple regression analysis indicated that between the three traditional predictor variables, only high school grade point average was significant as a predictor of academic success, accounting for 21% of the variance of first semester college grade point average. When added to the regression model high school rank increased the explained variance by 1% while ACT composite did not add to the explained variance of first semester college grade point average.

CHAPTER V

DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Based on the results of this study as reported in Chapter IV, it is important to understand the relevance of these findings as they relate to the study of student-athletes. This chapter presents the following sub-sections: (1) discussion of the results, (2) conclusions, (3) implications and recommendations, and (4) suggestions for further research.

Discussion

There has been an increased interest by university and athletic administrators, faculty, and various researchers in the academic preparedness, admission, and academic performance of students participating in intercollegiate athletics. In 1983 the NCAA adopted legislation that made the academic standards for students participating in intercollegiate athletics more stringent. In 1989 the Knight Foundation Commission on Intercollegiate Athletics was created to recommend reform, resulting in a new model for intercollegiate athletics oversight. Presidential control was directed towards the academic integrity, financial integrity, and certification of intercollegiate athletic programs (Knight Foundation Commission, 1991). In 1995 the NCAA implemented a more restrictive set of initial eligibility standards for intercollegiate athletics participation and in 2003 instituted the Academic Progress Rate; a metric that measures the semester by semester academic progress of student-athletes.

The purpose of this study was to identify selected academic variables that may serve as predictors of first semester academic success of at-risk scholarship football

student-athletes who matriculated at the University of Missouri during the academic years 2002-03, 2003-04, and 2004-05. For purposes of this study, at-risk was defined as a student admitted to the University of Missouri under the institution's special admission program while academic success was defined as a grade point average of 2.0 and above at the conclusion of the first semester of college. Both the University of Missouri and the NCAA utilize traditional academic variables to determine admission and initial eligibility respectively. As a result, this study analyzed the predictor variables of (a) High School Grade Point Average; (b) High School Rank; and (c) Standardized Test Score. Based on the analyses of first semester cumulative college grade point average, this study was designed to determine which academic variables best predict academic performance of student-athletes participating in the sport of football and who were admitted under the special admission program.

Permission to conduct this study on behalf of the University of Missouri was granted by the University Registrar. Permission to use human subjects for the research study was granted by the Campus Institutional Review Board. All data for this research project was compiled with the assistance of the University Registrar's office.

To predict the first semester cumulative college grade point average of at-risk scholarship football student-athletes, a stepwise multiple regression analysis was used to determine the level of variance explained by each predictor variable on the criterion variable. Correlations were done among the predictor variables and the criterion variable used in the study.

The independent variables of high school grade point average and high school rank were significantly correlated with the dependent variable of first semester college

54

grade point average. Additionally, these independent variables correlated highly with each other. Interestingly, ACT composite did not significantly correlate with first semester college grade point average and had a significantly low correlation with high school grade point average and high school rank.

The results of the three (3) research hypotheses, discussed in Chapter IV, show the following findings emerged in regard to the prediction of first semester academic success using traditional academic variables:

1. High school grade point average as a predictor of academic performance was statistically significant in predicting the first semester college grade point average of at-risk scholarship football student-athletes at the University of Missouri.

2. High school rank as a predictor of academic performance was not statistically significant in predicting the first semester college grade point average of at-risk scholarship football student-athletes at the University of Missouri.

3. Standardized test score as a predictor of academic performance was not statistically significant in predicting the first semester college grade point average of at-risk scholarship football student-athletes at the University of Missouri.

<div align="center">Conclusions</div>

Previous studies have shown that the effectiveness in using traditional academic variables as predictors of college academic performance varies depending on the population examined. Research conducted on student-athletes has shown high school grade point average to provide a statistically significant correlation to first semester college grade point average and when used alone appears to predict college grade point average more consistently than standardized test scores. Several studies analyzing high

school rank as a predictor of college academic achievement found that it is a more inclusive determinant than other traditional variables for minority student college admission. Other research has shown that high school rank is not a statistically significant correlate to first semester college grade point average. Standardized test scores have been found to be poor predictors for minorities but evidence does exist to suggest these measures are valid predictors for admitting students to college.

This investigation of the effectiveness of traditional academic variables predicting first semester academic success of at-risk football student-athletes at the University of Missouri appears congruent, for the most part, with previous research (Walter, Smith, Hoey, Wilhelm, & Miller, 1971; Astin, 1971; Fincher, 1986; Sellers, 1992; Petrie, 1993; Lawlor, Richman, & Richman, 1997). The main finding is that of the three (3) traditional academic variables used for both University of Missouri admission and NCAA initial eligibility, only high school grade point average was a significant predictor of first semester academic success, accounting for 21% of the explained variance. High school rank and ACT composite, when added to the predictive model, accounted for an additional explained variance of 1%.

When interpreting the findings of this study, the following conclusions can be made with regard to the use of high school grade point average, high school rank, and standardized test score in predicting first semester academic success for at-risk student-athletes participating in the sport of football at the University of Missouri:

1. High school grade point average was the best single predictor variable of first semester grade point average of at-risk football student-athletes.

2. High school rank was not a significant predictor variable of first semester grade point average of at-risk football student-athletes.

3. ACT composite was not a significant predictor variable of first semester grade point average of at-risk football student-athletes.

4. High school grade point average and high school rank had a positive relationship with first semester grade point average.

5. ACT composite had a negative relationship with first semester grade point average.

6. High school grade point average was positively related to high school rank but not positively related to ACT composite.

7. High school rank was positively related to high school grade point average but not positively related to ACT composite.

8. Overall, the combination of high school grade point average, high school rank, and ACT composite score as predictor variables of academic performance accounted for .223 of the explained variance of first semester college grade point average.

<u>Implications and Recommendations</u>

The implications and recommendations resulting from this study are discussed in this sub-section. The data presented in this study are specific to the University of Missouri and to its athletic program. This investigation built upon previous studies associated with student-athlete academic performance and contributed to the overall body of knowledge regarding the reliability of traditional academic variables as predictors for college success. Overall, this study has the potential to support efforts for both the

NCAA and the University of Missouri to examine non-academic variables when determining initial eligibility and admission.

This study has implications for the current NCAA initial eligibility requirements that limit the ability to receive athletics related financial aid and participation of student-athletes in their first year based on standardized test scores (ACT or SAT) and high school grade point averages. Employing only academic variables to predict student-athletes' academic performance seems questionable. The findings of this investigation imply that academic variables alone do not provide the most reliable predictions of student-athletes' academic performances. It appears that the use of traditional academic variables only may provide inadequate academic evaluations. Of the three (3) traditional academic variables analyzed in this study, only high school grade point average served as a statistically significant predictor of first semester college grade point average, accounting for 21% of the explained variance.

Currently, academic variables alone determine NCAA Division I initial eligibility. This investigation showed that the traditional academic variables had a low correlation in predicting first semester academic success which may suggest the incorporation of non-academic variables into the criteria. The use of high school grade point average and ACT scores to determine freshmen eligibility seems to provide only a one dimensional indication of college academic performance.

Understanding the best criteria for college admissions will allow institutions of higher learning to be more inclusive of a variety of students who can contribute to the character, culture, and tradition of the campus. Results of this study suggest that the use of traditional academic variables in determining admission, by themselves, may not

accurately predict college success, and as a result, may deny individuals the opportunity of a college education.

In its October 2006 report, the NCAA Presidential Task Force on the Future of Division I Intercollegiate Athletics recommended that "institutions should strengthen their admissions procedures by establishing a maximum number of special admissions for athletes, either for all sports programs or for individual teams." (NCAA News, January 1, 2007). If the NCAA membership adopts such a recommendation, the utilization of traditional academic variables alone in the determination of admissions may wrongly omit prospective student-athletes who would otherwise be successful academically.

This study has implications for the current University of Missouri admission requirements. The findings of this research should allow for the better understanding of the University of Missouri Office of Admissions in mandating admissions eligibility based solely upon academic variables. The results of this study demonstrate the value of incorporating broader admission criteria than just high school rank, standardized test score, and high school grade point average for at-risk student-athletes.

This investigation showed that the use of traditional academic variables alone, when determining the initial eligibility and university admission of at-risk football student-athletes at the University of Missouri, may not be the most accurate model for predicting academic success. Non-academic variables such as study habits, attitude toward education, leadership experiences, long-term goals, community service participation, and self-appraisal could be included in the evaluation criteria to best determine college academic performance for this population of student.

It is understood that traditional academic variables provide descriptive data on the entry level academic ability of students when determining admission to colleges and universities. However, based on the aforementioned implications, the following recommendations are presented as a result of the study:

1. It is recommended that the Office of Admissions of the University of Missouri consider the use of non-academic variables along with the traditional variables of high school rank, standardized test score and high school grade point average when determining the admission status of prospective student-athletes.

2. It is recommended that the Office of Admissions of the University of Missouri consider the creation of an admissions filtering system, incorporating non-academic variables, that would allow prospective students who do not meet existing admission standards the opportunity to be admitted without the stresses that accompany the special admit status (i.e. final probation, minimum first semester grade point average requirement).

3. It is recommended that the University of Missouri consider the creation of a campus wide summer bridge program to provide an opportunity for lesser academically prepared entering student-athletes to acclimate themselves to the campus community while completing a pre-determined three to six credit hours of course work.

4. It is recommended that the University of Missouri consider the implementation of a faculty mentoring program for at-risk student-

athletes to engage the students in relationships with individuals outside the realm of intercollegiate athletics.

5. It is recommended that the University of Missouri consider the design and implementation of a first year core curriculum for at-risk student-athletes that incorporates a strategic balance between general education courses and electives.

6. It is recommended that the NCAA consider the use of non-academic variables along with the traditional academic variables of high school grade point average and standardized test score in the determination of initial eligibility.

7. It is recommended that committees within and foundations outside the NCAA consider identifying non-academic variables to compliment the current variables used when determining initial eligibility prior to establishing enrollment caps for special admission student-athletes.

8. It is recommended that the University of Missouri and the NCAA consider utilizing standardized test scores more as a diagnostic tool and less as a restrictive standard for determining college admission and initial eligibility for student-athletes.

9. It is recommended that the University of Missouri and the NCAA encourage and support continued investigations of the effectiveness of traditional academic variables in determining college academic success and initial eligibility for student-athletes.

10.   It is recommended that this study be replicated by other Division I NCAA member institutions and if similar outcomes are discovered legislation should be sponsored to incorporate non-traditional variables in the determination of initial eligibility and the awarding of athletics related financial aid.

Suggestions for Further Research

This study intentionally focused on the traditional academic variables of high school grade point average, high school rank, and standardized test score because these are the common variables utilized to determine admission and initial eligibility by the University of Missouri and the NCAA respectively. Additionally, from an institutional perspective, these are the variables that ultimately determine if a prospective student-athlete is classified as a regular or special admission student. The following are suggestions for further research which should contribute to the overall body of knowledge:

1. It is suggested that future research be conducted with comparable data from the general at-risk population within the University of Missouri to determine if the current traditional academic variables used for admission are effective predictors of academic success for the non student-athlete population.

2. It is suggested that future research be conducted using non-cognitive variables to predict academic success for at-risk student-athletes (i.e. values, socioeconomic status, support programs, sport participation, ethnicity, gender, course selection and rigor, academic major).

3. It is suggested that future research be designed to include a larger sample of the student-athlete population by analyzing more cohorts, combining sports, or selecting samples from multiple institutions.

4. It is suggested that future research be designed to include a longitudinal study of the at-risk student-athlete to analyze retention and degree completion success.

5. It is suggested that future research be conducted that compares the academic performance and graduation success of at-risk student-athletes to all student-athletes.

6. It is suggested that future research be designed that allows for a comparative analysis of the first year college academic performance of at-risk four year college freshmen and at-risk junior college freshmen who did not meet NCAA initial eligibility standards.

7. It is suggested that future research be conducted on senior student-athletes who were at-risk during their freshman year to determine level of satisfaction encountered with their academic experiences.

8. It is suggested that future research be designed to examine the role and influences of coaches on the college academic performance of at-risk student-athletes.

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APPENDIX A

SAT/ACT CONVERSION TABLE

SAT Total	ACT Composite
1600	36
1590	36
1580	36
1570	35
1560	35
1550	35
1540	35
1530	34
1520	34
1510	34
1500	34
1490	33
1480	33
1470	33
1460	33
1450	32
1440	32
1430	32
1420	32
1410	32
1400	31
1390	31
1380	31
1370	31
1360	30
1350	30
1340	30
1330	29
1320	29
1310	29
1300	29
1290	28

1280	28
1270	28
1260	28
1250	27
1240	27
1230	27
1220	27
1210	26
1200	26
1190	26
1180	26
1170	25
1160	25
1150	25
1140	24
1130	24
1120	24
1110	24
1100	23
1090	23
1080	23
1070	23
1060	22
1050	22
1040	22
1030	22
1020	21
1010	21
1000	21
990	21
980	20
970	20
960	20

950	20
940	19
930	19
920	19
910	19
900	18
890	18
880	18
870	18
860	17
850	17
840	17
830	17
820	16
810	16
800	16
790	16
780	16
770	15
760	15
750	15
740	14
730	14
720	14
710	13
700	13
690	13
680	12
670	12
660	11
650	11
640	11
630	11

620	11
610	11
600	11
590	11
580	11
570	11
560	11
550	11
540	11
530	11
520	11
510	11
500	11
490	11
480	11
470	11
460	11
450	11
440	11
430	11
420	11
410	11
400	11

APPENDIX B

CORRELATION MATRIX OF CRITERION AND PREDICTOR VARIABLES TO

INCLUDE ACT ENGLISH AND ACT MATH

Correlation Matrix of Criterion and Predictor Variables for Academic Success
Prediction w/ACT English and ACT Math (n = 49)

Variables	MUGPA	HSGPA	HSR	ACTC	ACTE	ACTM
MUGPA	1.00	.486**	.399**	-.204	-.185	-.007
HSGPA		1.00	.695**	-.389**	-.247	-.207
HSR			1.00	-.447**	-.215	-.334*
ACTC				1.00	.695**	.787**
ACTE					1.00	.531**
ACTM						1.00

** $p < .01$
 * $p < .05$

VITA

Bryan S. Maggard was born on July 22, 1967 in Wichita, Kansas. He is the son of the late Lon G. and the late Helen M. Maggard. Raised in Dexter, Kansas, he graduated from Dexter Senior High School in 1985. He received a Bachelor of Science degree in Journalism and Mass Communication in May 1989 from Kansas State University. In May 1992, he received a Master of Science degree in Health and Physical Education also from Kansas State University.

Bryan began his career in athletic administration in 1990 as the academic counselor for the Kansas State football program. In 1993 he became the Assistant Director of Academic Services at Florida State University and in 1995 he accepted the position of academic coordinator for the University of Missouri football team. During his tenure at the University of Missouri, Bryan has been promoted to Assistant Athletic Director for Academic Services, Associate Athletic Director for Academic Services, and currently serves as the Associate Athletic Director for Student Services overseeing the areas of academic services, life skills programming, strength and conditioning, sports medicine, and equipment operations.

Bryan and his wife, Kerry, live in Columbia, Missouri with their three children, Dalton, Aubrey, and Kaylin.