Comparing Division IA Scholarship and Non-Scholarship Student-Athletes: A Discriminant Analysis

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Many research studies have examined the academic performance and graduation rates of college student-athletes. The limited focus on scholarship student-athletes has overlooked the majority of NCAA student-athletes, those participating in collegiate athletic programs without athletic scholarships. This study examined the academic performance, time-to-degree, and demographic and profile characteristics of Division IA scholarship and non-scholarship student-athletes. The theoretical framework for this study was work motivation viewing athletic scholarships as extrinsic rewards. The researchers applied descriptive discriminant analysis (DDA) utilizing secondary data to compare scholarship and non-scholarship student-athletes across several variables.

A discriminant function analysis revealed that non-scholarship student-athletes were described by the variables of sport (Women’s Outdoor Track and Field), race (Asian, White), sport type (Individual), and sex (Female). Non-Scholarship student-athletes had higher grade point averages than scholarship student-athletes. The scholarship student-athlete group was described by race (Black), sport (Football, Men’s Basketball, Women’s Basketball), sport type (Team), and sex (Male). Scholarship student-athletes graduated in fewer semesters than non-scholarship student-athletes did. This finding suggests that academic performance and time-to-degree variables are inversely related based on scholarship status. The results of the study showed significant differences between the scholarship and non-scholarship student-athlete groups based on demographic, academic performance, and time-to-degree variables.
Studies on college student-athletes and their academic performance are abundant, yet little has been written about non-scholarship student-athletes. Even in studies with athletic scholarships as factors, sometimes comparisons are not made on the issue of scholarships and few conclusions are given (Ervin, Saunders, Gillis & Hogrebe, 1985). The National Collegiate Athletic Association (NCAA) requires institutions to submit academic performance measures on student-athletes. However, these measures do not include non-scholarship student-athletes. They also measure “academic progress, not academic performance” (LaForge & Hodge, 2011, p. 228). According to the NCAA (2011), “Over 126,000 student-athletes receive either a partial or full athletic scholarship” in Divisions I and II out of approximately 400,000 student-athletes in all three divisions (para. 1). Non-scholarship student-athletes make up a significant percentage of the Division I student-athlete population, yet the NCAA only measures academic outcomes and graduation rates of student-athletes receiving athletic scholarships. Therefore, the purpose of this national study was to compare scholarship and non-scholarship student-athletes’ demographic and profile characteristics (i.e., sex, race, team type, sport type), academic performance (i.e., cumulative GPA), and time-to-degree (i.e., semesters) examining athletic scholarships as an extrinsic reward at NCAA Division IA football institutions.

Literature Review

The review of the relevant literature revealed three areas that informed this study to compare scholarship and non-scholarship student-athletes: academic performance, time-to-degree, and demographic and profile characteristics. First, the development of athletic scholarships for student-athletes and a historical overview of NCAA academic reform policy provided the background for this study.

The Development of Athletic Scholarships

The first intercollegiate athletic event, a crew race between Harvard and Yale, took place in 1852 (Sack & Staurowsky, 1998). These early athletic events in the mid to late 1800s attracted large crowds and public interest. Colleges championed an amateur ideal of the well-rounded student who could study and pursue athletics. At this time, few imagined what college sports would be like today. As the country encountered rapid industrialization, college athletics experienced growth and thus ideologies surrounding professionalism over amateurism emerged. Student-athletes started receiving athletic scholarships as early as the 1880s (Sack & Staurowsky, 1998).

The offer of financial aid for athletic ability angered faculty at higher education institutions because it detracted the educational mission of colleges. College athletics was fast becoming a business unrelated to the university, with athletes entering college without appropriate academic backgrounds (Sack & Staurowsky, 1998). The NCAA formed in 1906 in an attempt to regulate intercollegiate athletics, holding onto the amateurism ideal that students be recruited for athletics within institutions (Blackman, 2008; Sack & Staurowsky, 1998). The NCAA held onto this ideal for half a century until 1956, when athletic scholarships were permitted to save this ideal under the guise that it prevented students, officially dubbed student-athletes, from claiming employment status (Byers, 1995). By 1957, the NCAA allowed colleges
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to pay tuition, fees, room, and board to athletes as an incentive to play sports. Once athletic scholarships became acceptable, the NCAA created academic policies for students to qualify for athletics.

**Historical Overview: The Academic Regulation of College Athletes**

The NCAA used the introduction of legal athletic scholarships to regulate student-athletes’ scholarships, behavior, and academics. The NCAA had unsuccessfully tried to implement the Sanity Code in 1948, limiting athletic scholarships to students who demonstrated financial need and met institutional admissions requirements (Byers, 1995). Though this regulation was not well received, it established the NCAA’s power as a regulatory body over college athletics. In 1965, the NCAA enacted its first academic requirement, mandating that students have a 1.6 GPA in high school to prove they can handle college-level work. The standards for students with athletic ability were lower than the general student population (Blackman, 2008).

These low standards encouraged the NCAA to implement the “2.0 rule” in 1973, granting athletic eligibility to student-athletes with a 2.0 high school GPA. Not until 1986 did the governing body execute Proposition 48, requiring the 2.0 and a minimum 700 on the SAT or 15 on the ACT and 11 core high school courses. In three years, this was modified as Proposition 42 where students only meeting one of the criteria could still receive need-based aid but not athletic scholarships to complete (Blackman, 2008). The NCAA increased standards minimally, and they were still below basic requirements for general college applicants.

In 1996, the NCAA introduced Proposition 16, requiring 13 core courses and a sliding scale of GPA to test score. Studies showed that these policies continued to negatively affect Black student-athletes and student-athletes from lower socio-economic classes (Blackman, 2007; Covell & Barr, 2001). This slow progression and low standards encouraged the Knight Commission on Intercollegiate Athletics to publish a report in 2001 addressing concerns about the commercialization of college sports and the educational purpose of institutions of higher education. The report called for an increase in graduation rates and eligibility standards that complemented college entrance requirements. There needed to be a greater focus on academics over athletic performance.

The report reached a national audience and laid the foundation for more academic policy changes by the NCAA. In 2003, the NCAA developed the Academic Performance Program, creating new metrics and eligibility requirements. At this time, division I football schools were in division IA, now called Football Bowl Championship or FBS. The name change to FBS did not occur until the 2006-2007 school year, so the study’s context at the start of the Academic Performance Program refers to division IA. From 2004 to 2008, student-athletes would need to have completed 14 core classes completed in high school, and starting in Fall 2008, they must have completed 16. Degree progress standards increased from completing 25 percent of the degree program entering the third year to 40 percent, 50 percent entering the fourth year to 60 percent, and 75 percent entering the fourth year to 80 percent (Steinbach, 2004). The new metrics included the Academic Progress Rate, a measure of retention and eligibility by year, and the Graduation Success Rate, a more favorable way of calculating student-athlete graduation compared to the Federal Graduation Rate. However, these metrics only apply to student-athletes receiving athletic scholarships (LaForge & Hodge, 2011). The literature does not clarify why walk-on student-athletes are left out of the metrics calculations, although this omission is

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disconcerting. The 2003 Academic Performance Program provides the context for the student-athlete population examined in this study.

**Academic Performance**

Student-athletes’ academic performance can be affected simply by their participation in college athletics. Purdy, Eitzen and Hufnagel (1982) implemented a major 10-year study of the academic performance and educational attainment of college student-athletes. The purpose of their study was to assess the degree to which college athletes are disadvantaged educationally by their athletic participation. Identifying a gap in the literature, Purdy et al. (1982) included several variables left out of previous studies, including academic preparation, GPA, and graduation, comparing them in the categories of race, gender, and scholarship status. Purdy et al. (1982) were the first researchers to include scholarship status as a factor in this type of study.

Several important results emerged from this study. Purdy et al. (1982) found that student-athletes were less prepared academically than the general college student population and generally had lower GPAs and graduation rates than general college students as well. Student-athletes receiving athletic scholarships also were less prepared for college and had lower GPAs and graduation rates than non-scholarship student-athletes. The researchers suggested that athletic scholarships made student-athletes receiving them feel obligated as an employee to the institution to focus on athletics over academics.

Kingston, Horrocks, and Hanton (2006) studied motivation and scholarship status of student-athletes. They found that student-athletes on athletic scholarships exhibit more extrinsic motivation towards accomplishments. Also, Kingston et al. (2006) determined that athletic scholarships control scholarship student-athletes and their focus, thus weakening intrinsic motivation. Similarly, Medic, Mack, Wilson and Starkes (2007) examined how student-athletes’ motivation is affected by athletic scholarships. They concluded that full athletic scholarships control student-athletes’ behavior and cause feelings of pressure and guilt (Medic et al., 2007).

Bowen and Levin (2003) compared the academic performance of recruited student-athletes and walk-ons at institutions that do not provide athletic scholarships (Division III and Ivy League institutions). Bowen and Levin (2003) found parallels between their study and the previous studies, and the same concepts emerged. Student-athletes recruited for athletic talent felt more pressure to focus on athletics over academics, were less intrinsically motivated in the classroom than their walk-on teammates, and earned much lower grades than walk-on student-athletes even though they appeared to come in with the same academic preparedness. Bowen and Levin (2003) called this underperformance a phenomenon that surrounds the focus on athletic talent, especially since recruited student-athletes in their study performed worse than their teammates even when their sports were not in season. The results reinforce the divide between recruited scholarship student-athletes with non-recruited, non-scholarship student-athletes.

**Time-to-Degree**

Time-to-degree is an important factor to compare scholarship and non-scholarship student-athletes. Athletic scholarships are a major incentive for student-athletes because they can pay for some or all of students’ tuition, fees, books, housing, and meals. Student-athletes’ college costs may be alleviated by partial or full scholarships, sometimes in addition to financial
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A comparison between student-athletes on scholarship and non-scholarship student-athletes based on time-to-degree may reveal the influence of athletic scholarships on this factor. An examination of time-to-degree includes retention because students must persist towards college graduation or lose eligibility.

Kiger and Lorentzen (1986) studied how sport type, race, and gender affected the academic performance and retention of student-athletes. One finding indicated that student-athletes are more likely to letter in sports over the years, and therefore be retained (Kiger & Lorentzen, 1986). Athletes may be more extrinsically motivated to stay at their institutions and matriculate because of the scholarship award related to athletic talent they received to attend. Le Crom, Warren, Clark, Marolla and Gerber (2009) agreed with Kiger and Lorentzen, confirming that athletic scholarship support is a significant predictor of retention.

Le Crom et al. (2009) also suggested that student-athletes who receive less scholarship funding (individual sport athletes) may become more intrinsically motivated than those who receive higher levels of scholarship support (team sport athletes). Gaston-Gayles and Hu (2009) agreed, finding that low profile student-athletes have less athletic aid and are more engaged in academic activities than scholarship student-athletes. Non-scholarship student-athletes may be more intrinsically motivated to complete college since they are paying for it themselves. These studies examined team type as a factor, one of several background characteristics of student-athletes that influence time-to-degree and academic performance. Team type refers to revenue (profit-generating) and non-revenue sports. Revenue sports generally include football and men’s basketball, and depending on the institution, baseball and women’s basketball (Adelman, 1990; Ervin et al., 1985). For this study, only football and men’s basketball are considered revenue sports.

**Demographic and Profile Characteristics**

Determining if any of the characteristics of team type, sport type, race, and sex as they relate to scholarship status is important. There are two different sport types, team sports and individual sports. Student-athletes who play individual sports compete individually in competitions, even if there is an overall team score calculated. Examples of individual sports are tennis, golf, and wrestling. Student-athletes participating in team sports compete as a group in competition, and performance and scores are not attributed to individuals (Baker, Yardley & Cote, 2003; Chelladurai & Saleh, 1978).

Revenue sports are those that typically generate revenue for the institutions that sponsor them. Revenue sport athletes come to campuses less prepared academically than other athletes (Adelman, 1990; Kiger & Lorentzen, 1986). Purdy et al. (1982) concluded that football players performed the worst academically and had the lowest graduation rates among all athletes. Revenue sport participants have a lower probability of graduating than other athletes and non-athletes (Purdy et al., 1982). Upthegrove, Roscigno, and Charles (1999) examined the academic performance of Division I student-athletes in revenue sports compared to those in non-revenue sports. Students in revenue sports faced competing academic and athletic pressures which caused them to repeat courses or be placed on academic probation. These students were found to be twice as likely to face problems because of time management challenges and their intensely competitive environments (Upthegrove et al., 1999).

Maloney and McCormick (1993) determined that athletes in non-revenue sports perform nearly identically to the general student body relative to their background characteristics.
Football and basketball players perform worse than their peers (Maloney & McCormick, 1993). Other studies showed that individual sport and non-revenue sport athletes exhibit stronger intrinsic motivation toward academics than team sport and revenue sport athletes (Gaston-Gayles & Hu, 2009; Le Crom et al., 2009). Purdy et al. (1982) found that individual sport athletes were more likely to graduate than team sport athletes.

Previous studies on student-athletes have included race and sex as factors. Black student-athletes are one of the most studied groups. Upthegrove et al. (1999) noted the troubling number of Black students participating in revenue sports, where academics often come second. Low income Black student-athletes are the least likely to persist in college (Mendez et al., 2009). Black student-athletes tend to be underprepared for college and have lower scores on educational measures (Purdy et al., 1982). The Journal of Blacks in Higher Education (2004/2005) pointed out that Black student-athletes receiving athletic scholarships perform better academically and have higher retention rates than Black students. Kiger and Lorentzen (1986) concluded that generally White female non-revenue sport participants perform the best academically, whereas Black male revenue sport athletes perform the worst.

Meyer (1990) explored how female student-athletes experience athletics and academics, and how they evaluate their expectations and college experiences. Through her interviews with scholarship female student-athletes, Meyer found that teammates were positive influences on academics and teams created an atmosphere that supported academics and helping each other (Meyer, 1990). Adler and Adler (1985) found quite the opposite among male basketball players in their study to determine if athletic participation enhances or hinders academic performance. These scholarship revenue sport athletes were extrinsically motivated toward basketball. Unlike the females interviewed by Meyer (1990), these male basketball players received reinforcement for their athletic performance, and no one monitored their academic behavior. Female student-athletes appear to be more intrinsically motivated towards academics, and male student-athletes more extrinsically motivated to their athletic demands. Intrinsic and extrinsic motivation may direct student-athletes toward academic or athletic endeavors.

**Theoretical Framework**

The concept of motivation in work was examined as a theoretical framework for this study. Herzberg’s (2008) classic work on motivation in organizational settings contends that individuals can be motivated extrinsically and intrinsically by two work factors: motivation and hygiene factors. The first, motivators, are connected to intrinsic motivation, including “achievement, recognition for achievement, the work itself, responsibility, and growth/advancement” (p. 24). Motivators have a long-term effect on employees. The second, hygiene factors, are connected to extrinsic motivation. These include “company policy/administration, supervision, interpersonal relationships, working conditions, salary, status, and security” (Herzberg, 2008, p. 24). All of the hygiene factors bring temporary satisfaction to the worker. Motivators drive workers to achieve, and hygiene factors motivate employees for a temporary incentive.

This framework allows the researchers to examine this study through the hygiene factors in Herzberg’s two-factor theory. For the purpose of this study, athletic scholarships are extrinsic motivators. Therefore, scholarship student-athletes are viewed through the extrinsic lens, and non-scholarship student-athletes are examined as non-extrinsic. Regarding extrinsic motivation, Herzberg (1966) expressed,
A hygiene seeker is not merely a victim of circumstances, but is motivated in the direction of temporary satisfaction. It is not that his job offers little opportunity for self-actualization; rather, it is that his needs lie predominantly in another direction that of satisfying avoidance needs. Other words, he is seeking positive happiness via the route of avoidance behavior, and as a result chronic dissatisfaction as an illness of motivation. (p. 81).

Essentially, hygiene factors motivate employees for a temporary incentive while motivators drive employees to long-term achievement.

Lawler (1994) added that extrinsic rewards are not necessarily consistent motivators. He wrote,

Studies have shown that factors such as pay satisfaction, job level within the organization, and how pay is determined influence the importance of pay and promotion. Altogether, the studies show that significant and comprehensible individual differences exist in the importance people assign to extrinsic rewards. These studies suggest that organizations have relatively little control over the degree to which their members will value extrinsic rewards. (Lawler, 1994, p. 145).

The results of this study may help determine the power of an extrinsic motivator.

Since athletic scholarships are primarily awarded for athletic ability and not academic achievements, the extrinsic motivator of money does not motivate performance for the academic responsibilities of a student on athletic scholarship. Lawler (1971) demonstrated, “Failure to tie pay closely to performance in many companies could mean that pay is not motivating job performance. In order for pay to motivate performance, it must appear to be related to performance; and employees are not likely to believe that pay is related to performance if it is actually not” (p. 159). Further, “Reward systems motivate employees to perform well in those aspects of their jobs that are measured by the performance-evaluation system. The problem is that the evaluation system doesn’t always measure all the behaviors that need to be performed. The results indicate those behaviors that aren’t measured tend to be ignored or performed poorly” (Lawler, 1994, p. 155). Notz (1975) clarified Herzberg’s hygiene description, explaining, “Rewards such as pay, fringe benefits, and promotions are extrinsic because they provide satisfaction that is independent of the actual activity itself and because they are controlled by someone other than the [recipient]” (p. 884). Student-athletes with athletic scholarships face a balancing act between athletic responsibilities tied to a monetary reward and educational pursuits.

Because scholarships are specifically given for athletic performance, their effect on academic performance is unclear. This study aimed to determine the influence of this extrinsic reward. Table 1 shows the relationship between the theory of work motivation, scholarship status, the areas of academic performance, time-to-degree, and athletes’ demographic and profile characteristics. Table 1 exhibits the influence of the extrinsic reward on scholarship student-athletes in comparison to the non-extrinsic non-scholarship student-athlete group through the perspective of demographic and profile characteristics on academic performance and time-to-degree variables. The following research question guided the study: Are there differences in demographic and profile characteristics (i.e., sex, race, team type, sport type), academic performance (i.e., cumulative GPA), and time-to-degree (i.e., semesters) between scholarship and non-scholarship student-athletes examining athletic scholarships as an extrinsic reward?
Table 1 - Relationship between Theory, Scholarship Status, and Variables in the Analysis

<table>
<thead>
<tr>
<th>Scholarship Status</th>
<th>Non-Scholarship</th>
<th>Scholarship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herzberg’s Two-Factor Theory (Hygiene)</td>
<td>Non-Extrinsic</td>
<td>Extrinsic Athletic Scholarship</td>
</tr>
<tr>
<td>Demographic and Profile Characteristics</td>
<td>Sex Race Team Type Sport Type</td>
<td></td>
</tr>
<tr>
<td>Academic Performance</td>
<td>Cumulative Grade Point Average</td>
<td></td>
</tr>
<tr>
<td>Time-to-Degree</td>
<td>Semesters to Graduation</td>
<td></td>
</tr>
</tbody>
</table>

Method

Data Source

This study draws from institutional secondary data provided by eight institutions. Initially, the authors identified colleagues representing a variety of Division IA institutions in a professional organization of athletic academic specialists, described the study to each contact, and received verbal commitments from institutions to provide data. Fifteen institutions were contacted during the data collection process. After the initial contact of these institutions, some were unwilling to participate, which yielded participation from eight for this study. These eight institutions had 10 NCAA Division I sports in common.

The authors complied with these eight institutions’ policies to collect data. The athletic academic professionals at these institutions were sent a letter outlining the institutional approval with the data request, along with a data collection sheet and instructions. The data request included the scholarship status of student-athletes entering in Fall 2004 on the squad lists for the 10 sports examined in the study, cumulative GPAs, graduated status, semesters to graduation, race, and sex. The contact person on each campus first requested approval from the athletic director. Then, he or she designated professionals in the academic services, athletic compliance, and registrar’s office to compile the appropriate data from those departments. The data collection sheet instructed institutional data brokers to collect the data requested, delete student identifiers including names and identification numbers, and send it to the designated data steward. The point person then gathered the requested data from these units and sent all of it to a designated data steward in a compiled format.

The population for this study is comprised of all NCAA student-athletes on a university athletic team roster at Division IA football institutions in the cohort that entered college as freshmen for the 2004-2005 academic year. There are 120 such institutions in the United States. All of the student-athletes were required to meet the same academic requirements to enter and compete as a Division I student-athlete during their entire enrollment. The data from each institution is comprised of all student-athletes in the 2004 cohort from 10 sports (three men’s and seven women’s). The sample draws from eight different institutions in regions around the country. The eight institutions had 10 sports in common that were considered in this study: Men’s Basketball, Women’s Basketball, Women’s Cross Country, Men’s Golf, Football, Women’s Soccer, Softball, Women’s Tennis, Women’s Outdoor Track and Field, and Women’s Volleyball. The sample size for this study was 593 student-athletes. Of this sample, 221 (37.1%)
of students were non-scholarship student-athletes, and 372 (62.4%) were scholarship student-athletes.

**Descriptive Statistics**

Descriptive statistics were also provided to describe student-athletes in the sample. The demographic and profile characteristics in this study included sport, sport type (team or individual), team type (revenue or non-revenue), race, and sex. This study looked at team sport and individual sport student-athletes. The total number of team sport student-athletes was 393 (65.9%) and the total number of individual sport student-athletes was 200 (33.6%). Team type describes revenue versus non-revenue sports. In this study only Football and Men’s Basketball were considered revenue sports. The total number of revenue sport student-athletes was 217 (36.4%). Non-revenue sports included the remaining eight sports in the study (all women’s sports and Men’s Golf). The total number of non-revenue sport student-athletes was 375 (63.1%).

Based on self-reported data by students to their respective institutions, 582 students presented information on their race. The student sample was 1.5% Asian (9), 23% Black (137), 4.7% Hispanic (28), 1.2% International (7), 1.5% Mixed (9), 1.8% Native American (11), 1.2% Pacific Islander (7), and 62.8% White (374). In the overall sample, 41.6% (248) of the students were male and 57.9% (345) were female. Examining the sample by scholarship status, 40.3% (89) of non-scholarship student-athletes were male and 59.7% (132) of non-scholarship student-athletes were female. In the scholarship student-athlete group, 42.7% (159) were male and 57.3% (213) were female.

The academic performance variable used in the study is the final cumulative grade point average (GPA) of each student-athlete. This GPA is the cumulative grade point average recorded by the institution either upon graduation or when the student-athlete left prior to degree completion for any reason. Of the 593 student-athletes, 581 had GPAs submitted. The mean GPA for the entire data set was 2.93 (SD=.680). Five of the seven women’s teams had GPAs over 3.00, with the highest being Women’s Soccer (3.34), Women’s Tennis (3.33), and Women’s Cross Country (3.29). The lowest GPAs were Football (2.56) and Men’s Basketball (2.60). The mean GPA for females was 3.18 (SD=.571) and 2.58 (SD=.669) for males. Examining scholarship status, the mean GPA for non-scholarship student-athletes was 2.96 (SD=.772) and 2.91 (SD=.619) scholarship recipients.

The time-to-degree included semesters to graduate. Within the data set, 389 student-athletes had valid information for the semesters to graduate variable. The results for this variable only measure the students who did graduate in the data set. The students who did not graduate due to dropping out or becoming professional athletes are not included. This data may be analyzed in a future study to describe the group by demographic and academic variables. The count of semesters did not include summer sessions. Students do not usually take a full-time course load in the summer and summer sessions are not consistent in length of time or number of sessions offered. Thus, it is hard to compare summer sessions between institutions. Some institutions have a “Maymester” than can count towards spring semester or summer session grades. Also, athletic scholarships do not guarantee coverage of summer tuition. Participating institutions did provide summer graduates in the data, who were considered “Spring” graduates in the study.
For this study, data from any quarter schools matched graduation dates provided that fell within a traditional semester to denote the semester graduated. Traditionally, college degree programs are designed to be completed full-time in four years, which equates to eight semesters. The mean semesters to graduate for the data set was 9.09 (SD=1.489). The team with the lowest semesters to graduation was Women’s Tennis at 8.53. There were 129 males with a mean of 9.40 semesters to graduate (SD=1.679) and the 263 females with 8.94 (SD=1.363) semesters to graduate. Next, scholarship status was examined with semesters to graduate. The non-scholarship student-athlete group had 146 with a mean of 9.34 semesters to graduate (SD=1.568), while the scholarship student-athlete group had 246 with a mean of 8.95 semesters to graduate (SD=1.423).

Results

Descriptive discriminant analysis (DDA) was employed to answer the stated research question. The comparable groups in this study, scholarship and non-scholarship student-athletes, were compared by academic performance (i.e., GPA), time-to-degree (i.e., semester graduated), and background characteristics of student-athletes (i.e., race, sex, sport type, and team type) within those two groups. Dummy variables were used to code variables for statistical analysis (Huberty, 1994). The researcher conducted a singular discriminant function analysis model to describe the grouping variable of scholarship status.

The Discriminant Function Analysis

The model indicated that the combination of the response variables in the final discriminant function described (correctly classified) 68% of the scholarship status groups’ differences. The canonical correlation of .394 demonstrates the group differences; since larger numbers (closer to one) mean the groups are more closely associated (Klecka, 1985). The function’s group centroids, which are imaginary points with coordinates that are the group’s mean on each of the variables, displayed a good spread with the non-scholarship student-athlete group at .552 and the scholarship student-athlete group at -.332. The Wilks’ lambda was .845 ($p < .000$), and the larger the lambda is (closer to one), the more the groups will be separated on the discriminant function (Klecka, 1985). The Wilks’ lambda calculation was also statistically significant. Klecka (1985) noted, “A significant lambda means we are safe in assuming that the results [came] from a population which did have differences between the groups” (p. 40).

Demographic and Profile Characteristics

The first area analyzed was demographic and profile characteristics (i.e., sex, race, team type, sport type). A large number of demographic variables were not statistically significant. All but three of these variables were removed from the discriminant function before the final model was analyzed. These variables included Team Type, Hispanic, International, Mixed, Native American, Pacific Islander, Men’s Golf, Women’s Cross Country, Women’s Soccer, Softball, Women’s Tennis, and Women’s Volleyball. The three variables not statistically significant that were retained in the model were Sex, Football, and Men’s Basketball because they have been extensively researched. Moreover, the deletion of variables in the final model is not a concern.
when it comes to considering the deletion of variables in the context of descriptive discriminant analysis (DDA) (Huberty & Olejnik, 2006).

Table 2 displays a statistical summary of demographic and profile characteristics and how they describe the scholarship and non-scholarship student-athlete groups.

**Table 2 - Demographic and Profile Characteristics in Descriptive Discriminant Analysis**

<table>
<thead>
<tr>
<th>Demographic &amp; Profile Characteristics</th>
<th>Standardized Canonical Coefficient</th>
<th>Structure Coefficient</th>
<th>Described Group (Scholarship Status)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women’s Track &amp; Field</td>
<td>.587</td>
<td>.503</td>
<td>Non-Scholarship</td>
</tr>
<tr>
<td>Black</td>
<td>-.084</td>
<td>-.386</td>
<td>Scholarship</td>
</tr>
<tr>
<td>Asian</td>
<td>.543</td>
<td>.381</td>
<td>Non-Scholarship</td>
</tr>
<tr>
<td>Women’s Basketball</td>
<td>-.211</td>
<td>-.325</td>
<td>Scholarship</td>
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<tr>
<td>White</td>
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<td>.301</td>
<td>Non-Scholarship</td>
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<td>Team Sports</td>
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<tr>
<td>Sex</td>
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<td>.169</td>
<td>Female</td>
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<td></td>
<td></td>
<td></td>
<td>=Non-Scholarship*</td>
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<tr>
<td>Men’s Basketball</td>
<td>.105</td>
<td>-.104</td>
<td>Scholarship</td>
</tr>
<tr>
<td>Football</td>
<td>.442</td>
<td>-.058</td>
<td>Scholarship</td>
</tr>
</tbody>
</table>

*Note. *Dummy coding explains these results. Team sports were coded as “1” and individual sports as “0.” Females were coded “1” and males, “0.”

The first column contains the demographic and profile characteristics used as response variables in the analysis. The second column contains the standardized canonical coefficients, which indicate the relative importance of the two student-athlete groups in being described by the demographic characteristics. The larger the magnitude of the standardized canonical coefficient, the greater is that variable’s contribution to the description of a group (Klecka, 1985). This coefficient allows variables that are measured on different scales to be compared within the function. While reporting the magnitude of these coefficients is important, much of the literature suggests that structure coefficients are better for interpretation (see Huberty, 1994; Marcoulides & Hershberger, 1997 for further explanations).

The third column presents the structure coefficients, which show the correlations of each variable with the discriminant function. Structure coefficients are not affected by relationships with other variables (Klecka, 1985). The response variables were dummy coded with 0 and 1, so the closer a structure coefficient is to 1, the more that variable has in common with one of the student-athlete groups. In this study, negative structure coefficients described variables’ relationships with scholarship student-athletes, and positive structure coefficients described variables’ relationships with non-scholarship student-athletes. Using Tabachnick and Fidell (2012) and Comrey and Lee (1992) as guides, structure coefficients greater than .3 were considered favorable. However, Tabachnick and Fidell (2012) suggested the size of loadings is influenced by the homogeneity of scores in the sample. If homogeneity is suspected, interpretation of lower loadings is warranted and a matter of researcher preference (p. 654).
Women’s Outdoor Track and Field had the highest structure coefficient at .503. Sex, Men’s Basketball, and Football were not statistically significant in the discriminant function analysis.

The fourth column shows the described group based on the grouping variable of scholarship status for each response variable. This column displays the following:

- Scholarship student-athletes are more likely to describe Black student-athletes and student-athletes who participate in team sports.
- The teams of Football, Men’s Basketball, and Women’s Basketball tend to have more scholarship student-athletes than non-scholarship student-athletes on their rosters.
- White and Asian student-athletes are more likely to describe non-scholarship student-athletes.
- Female student-athletes are more likely to describe non-scholarship student-athletes.
- The sport of Women’s Outdoor Track and Field tends to have more non-scholarships student-athletes on its roster.

As previously discussed, the response variables that were not statistically significant besides Sex, Football, and Men’s Basketball were removed from the discriminant function model.

**Academic Performance**

The second area analyzed was academic performance (i.e., cumulative GPA). As shown in Table 3, the standardized canonical coefficient is .481. As noted earlier, the larger the coefficient, the more contribution it has to describing differences between the scholarship and non-scholarship student-athlete groups (Klecka, 1985). The structure coefficient of .361 is well above .3 as previously mentioned. The closer this number is to 1, the more it has in common with the non-scholarship student-athlete group. The positive .361 value indicates that non-scholarship student-athletes are described by higher GPAs.

**Table 3 - Academic Performance in Descriptive Discriminant Analysis**

<table>
<thead>
<tr>
<th>Academic Performance Variable</th>
<th>Standardized Canonical Coefficient</th>
<th>Structure Coefficient</th>
<th>Described Group (Scholarship Status)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Point Average</td>
<td>.481</td>
<td>.361</td>
<td>Higher GPAs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=Non-Scholarship*</td>
</tr>
</tbody>
</table>

*Note. *As mentioned previously, negative structure coefficients relate to scholarship student-athletes, and positive structure coefficients are associated with non-scholarship student-athletes.

**Time-to-Degree**

The third area analyzed was time-to-degree (i.e., semesters). Table 4 shows the time-to-degree portion of the discriminant function analysis. The semesters to graduate standardized canonical coefficient is .488, demonstrating the strength in discriminating between the two student-athlete groups. The structure coefficient is close to .3, but is relatively weak in magnitude. The positive number indicates that the higher the number for semesters to graduate,
the non-scholarship student-athlete group is described. Essentially, the analysis suggests non-
 scholarship student-athletes take longer to graduate than scholarship student-athletes in this 
study.

Table 4 - Time-to-Degree in Descriptive Discriminant Analysis

<table>
<thead>
<tr>
<th>Time-to-Degree Variable</th>
<th>Standardized Canonical Coefficient</th>
<th>Structure Coefficient</th>
<th>Described Group (Scholarship Status)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semesters to Graduate</td>
<td>.488</td>
<td>.288</td>
<td>More Semesters to Graduate =Non-Scholarship*</td>
</tr>
</tbody>
</table>

*As mentioned previously, negative structure coefficients relate to scholarship student-athletes, and positive structure coefficients are associated with non-scholarship student-athletes.

The DDA examined the statistical significance of response variables describing the scholarship and non-scholarship student-athlete groups. The discriminating variables in the demographic and profile characteristics category were Asian, Black, White, Women’s Basketball, Women’s Outdoor Track and Field, and Sport Type. The model also included Sex, Men’s Basketball and Football, but they were not statistically significant variables. Grade point average was the discriminating variable for academic performance, and semesters to graduate was the discriminating variable for time-to-degree.

Discussion

This study compared variables of demographic and profile characteristics, academic performance, and time-to-degree between scholarship and non-scholarship student-athletes at Division IA football institutions. The results indicated that several variables describe these two groups based on scholarship status. This discussion has three sections: demographic and profile characteristics, academic performance, and time-to-degree.

Demographic and Profile Characteristics

The study examined the demographic and profile characteristics of sport type (team or individual), team type (revenue or non-revenue), race, and sex.

Sport and sport type. In previous studies, comparisons by sport were not the focus of research. Research has compared student-athletes to the general student population (e.g., Purdy et al., 1982; Ferris et al., 2004). From the DDA, the sports of Women’s Basketball, Men’s Basketball, and Football emerged as descriptors of scholarship student-athletes. The sport of Women’s Outdoor Track and Field described non-scholarship student-athletes. The other six sports in this study did not have significant results in describing either of the two student-athlete groups. These sports included Men’s Golf, Women’s Cross Country, Women’s Soccer, Softball, Women’s Tennis, and Women’s Volleyball.

Sport and scholarship status has not been extensively researched previously, and there are many possibilities for the lack of significance in the DDA. Many of these teams have small rosters. Some of these sports provide full scholarships and some of them provide partial
scholarships to student-athletes. Three of them are team sports and three of them are individual sports. This outcome should be examined further in the future by looking at roster size and scholarship amounts. This study did, however, examine sport type to describe differences between scholarship and non-scholarship student-athletes.

Several studies (Gaston-Gayles & Hu, 2009; Kiger & Lorentzen, 1986; Le Crom et al., 2009; Purdy et al., 1982) have looked at team and individual sport comparisons. The results of the DDA showed that team sports are strong descriptors of scholarship student-athletes. This outcome could explain that individual sports describe non-scholarship student-athletes. For example, the NCAA has two types of scholarship systems, head count or full scholarships and equivalency or partial scholarships (George, 1999). Four of the five head count sports in this study are team sports (Football, Men’s Basketball, Women’s Basketball, and Women’s Volleyball). Three of the five equivalency sports in this study are individual sports (Men’s Golf, Women’s Cross Country, and Women’s Outdoor Track and Field). Interestingly, scholarship student-athletes on head count sport teams have most academic and living expenses covered, and the non-scholarship student-athletes on these teams receive no athletic scholarship—this would support an all or nothing situation. On equivalency sport teams, scholarship student-athletes may have as little as a book scholarship or as much as a full scholarship, and non-scholarship student-athletes receive nothing (George, 1999). The disparity is less apparent, and coaches have more flexibility to disburse scholarship funds among their team members. Previous research did find a disparity between team and individual sport student-athletes. For example, Purdy et al. (1982) noted, “Athletes involved in individual sports secured better college grades and were more likely to graduate than those who participated in team sports” (p. 444).

Team sports reach a wide audience. Sports like Men’s Basketball receive enormous media attention (Adler & Adler, 1985). Adelman (1990) found that student-athletes in revenue sports are more likely than non-revenue and individual sport athletes or non-athlete students to receive scholarships. The revenue sports in this study are Football and Men’s Basketball, which are team sports.

**Team type.** Football and Men’s Basketball are popular sports to study because of the media attention they receive, and an abundance of research on revenue sports has been conducted (Adelman, 1990; Adler & Adler, 1985; Ervin et al., 1985; Maloney & McCormick, 1993; Pascarella et al., 1999; Purdy et al., 1982; Upthegrove et al., 1999). Revenue sport student-athletes are more apt to experience academic difficulties, intensely competitive environments, and time management problems, all of which affect long term achievement (Upthegrove et al., 1999). A few studies (Kiger & Lorentzen, 1986; Purdy et al., 1982) discovered that revenue sport student-athletes came into college less prepared than other student-athletes and have a low probability of completing their education compared to other student-athletes and non-athlete students. Pascarella et al. (1999) found that football and men’s basketball student-athletes had significantly lower writing ability than other student-athletes after the second year in college.

Maloney and McCormick (1993) summarized, “Athletes in the nonrevenue sports grade nearly identically to the rest of the student body relative to their background characteristics. On the other hand, football and basketball men do somewhat worse than their peers” (p. 562). While these findings are alarming, the NCAA continues to implement policy changes to increase requirements for student-athletes to compete at the college level, and revenue sport student-athletes continue to struggle. Surprisingly, the DDA results for sport type were not significant in the descriptive discriminant analysis. The DDA results showed that revenue sports, Football and
Men’s Basketball in this study, are more likely to have scholarship student-athletes on their teams, but the structure coefficients were below the .2 benchmark for significance.

Race. The sample included students reported in the categories of Asian, Black, Hispanic, International, Mixed, Native American, Pacific Islander, and White. Several races were not significant in the DDA, including Hispanic, International, Mixed, Native American, and Pacific Islander. In this sample there were very few student-athletes in these categories. In discriminant analysis, the sample size of the data is recommended to be at least three times the number of variables (Huberty, 1994). Data from variables with small sample sizes like these race categories tend to increase bias on results (Friedman, 1987). From the DDA results, Black student-athletes describe the scholarship student-athlete group, and White and Asian student-athletes describe the non-scholarship student-athlete group.

The Journal of Blacks in Higher Education (2004/2005) emphasized that Black student-athletes receiving athletic scholarships perform better in the classroom and have higher retention rates. In contrast, this study determined Black student-athletes have lower GPAs (mean=2.52 in this study) and need more semesters to graduate (mean=9.45 in this study) than other student-athletes. Scholarship student-athletes as a group, which are more likely to be described by Black students, graduated at a mean of 8.95 semesters. Not surprisingly, Upthegrove et al. (1999) warned of the high concentration of Black student-athletes in revenue sports causing a troubling athletic-academic tension. According to Kiger and Lorentzen (1986), both minority and revenue sport student-athletes receive higher proportions of financial assistance compared to other student-athletes. The results suggest Black student-athletes, Football student-athletes, and Men’s Basketball student-athletes describe the scholarship student-athlete group, supporting the previous work of Kiger and Lorentzen (1986).

Sex. In this study, both student-athlete groups had more females than males, since only three men’s sports were included while there were seven women’s sports. In the discriminant analysis, the variable of sex was kept in the function because it is an important variable and has been researched previously. However, the structure coefficient was weak. Based on the results, females are more likely to be described as part of the non-scholarship student-athlete group. Meyer (1990) determined female student-athletes are able to balance academics and athletics due to the lack of recognition for women’s sport. Teammates encourage each other to excel in academics (Meyer, 1990). Kiger and Lorentzen (1986) learned White female nonrevenue student-athletes perform the best academically, but their study did not connect this with scholarship status. This finding links the academic success of female student-athletes with the lack of athletic scholarships.

Academic Performance

This study examined cumulative grade point average (GPA) as the variable for academic performance. The sample included seven women’s teams, five of which had mean GPAs over 3.00. Softball was close with a mean GPA of 2.98. In contrast, the lowest mean GPAs were from Football and Men’s Basketball. The poor academic performance of participants on these teams has been researched previously (e.g., Adelman, 1990; Pascarella et al., 1999; Purdy et al., 1982). Females had a mean GPA of 3.18 and males had a mean GPA of 2.58. Adler and Adler (1985) mentioned the reinforcement of athletic achievements over academics among Men’s Basketball student-athletes.
The lowest GPAs were Pacific Islanders with a mean GPA of 2.34 and Blacks with a mean GPA of 2.52. Purdy et al. (1982) noted Black athletes had significantly lower scores on the entire range of educational achievement measures they studied, including GPA. Upthegrove et al. (1999) stressed Black student-athletes brought academic inequalities to college, which are exacerbated by their participation in intercollegiate athletics, primarily in the revenue sports. Kiger and Lorentzen (1986) examined several demographic characteristics with GPA, concluding, “In general, White female nonrevenue sport participants, as a group, have the highest level of university academic performance. Black male revenue sport players perform most poorly as a group.” However, The Journal of Blacks in Higher Education (2004/2005) found, “The evidence is clear that Black scholarship athletes actually perform better academically than Black students as a whole” (p. 68). Looking at scholarship status, there was only a mean difference of .05 between the scholarship and non-scholarship groups, which was not statistically significant.

The DDA results for the academic performance variable of grade point average indicated the non-scholarship student-athlete group is described by higher GPAs. The study by Purdy et al. (1982) was the first and only major study to include scholarship status as a factor. One important finding from the study was scholarship student-athletes had lower GPAs than non-scholarship student-athletes (Purdy et al., 1982). Kingston et al. (2006) cautioned that scholarships can negatively affect student motivation. Through their extensive study of nineteen athletic institutions, Bowen and Levin (2003) noted, “Recruited athletes underperform significantly whereas most walk-ons do not” (p. 167). Thus, the results’ finding non-scholarship student-athletes are more likely to have higher GPAs is not surprising and confirms the results of previous empirical research.

Time-to-Degree

This study examined semesters to graduate as the variable for time-to-degree. In the data set, 33.6% of the student-athletes did not graduate, and 65.3% reported graduating. Several researchers concluded that athletic scholarships are positively related with retention and persistence toward graduation. Kiger and Lorentzen (1986) discovered scholarship student-athletes lettered in sports over the years with the more aid he or she received. Le Crom et al. (2009) insisted scholarship support is a significant predictor of retention. Adelman (1990) added that a student who earns a scholarship is less likely to drop out for financial reasons.

For the student-athletes in this study who graduated, the mean semesters to graduate was 9.09. The struggling revenue sport participants took the longest to graduate, with Football’s mean of 9.30 semesters and Men’s Basketball’s mean of 10.22 semesters. The findings of previous studies (Adelman, 1990; Adler & Adler, 1985; Ervin et al., 1985; Maloney & McCormick, 1993; Pascarella et al., 1999; Purdy et al., 1982; Upthegrove et al., 1999) help to explain these numbers.

Semesters to graduate was also examined by race and sex. The mean semesters to graduate for male student-athletes was 9.40 and the mean for females was 8.94. According to Mendez et al. (2009), race and ethnicity are significant factors in student-athlete persistence in combination with financial aid formulas. To support the significance of race as a factor, The Journal of Blacks in Higher Education (2004/2005) stated,
It is likely that the financial aid provided by an athletic scholarship is a critical factor in enabling many Black student athletes to stay in school. Black students who are not on athletic scholarship are far more likely to drop out of college for financial reasons. Essentially, this conjecture incorporates scholarship as a major factor in determining the graduated status and time-to-degree of Black student-athletes.

One of the most surprising results of this study was the mean differences in time-to-degree by scholarship status. The mean semesters to graduate for the non-scholarship student-athlete group was 9.34, and the scholarship student-athletes’ group mean was 8.95. The DDA confirmed that the higher number of semesters it takes to graduate, the more the non-scholarship student-athlete group is described. Mendez et al. (2009) found that student-athlete persistence is significantly influenced by financial aid in addition to athletic scholarships. Non-scholarship student-athletes may or may not have financial aid. Therefore, non-scholarship student-athletes may need aid, whether in the form of financial aid from the institution or athletic scholarships, to reduce the longer time-to-degree process. All NCAA student-athletes are required to be enrolled full-time to be eligible for participation in intercollegiate athletics (NCAA, 2013, p. 135). A full-time course load is twelve semester credit hours, though there are NCAA rules exceptions for graduating seniors who have less than twelve credits remaining and graduate students considered full-time while enrolled in six or nine credits. For students to graduate in the traditional eight semesters, students would most likely take fifteen credit hours to graduate on time. However, students (including student-athletes) without any type of aid may choose to enroll in only 12 credits because it is all they can afford, therefore slowing down the time-to-degree and increasing the semesters to graduate.

**Implications for Theory**

In the foundational work of Herzberg (1966), two factors of work motivation were introduced, motivators and hygiene. Herzberg (1966, 2008) explained how motivators are growth factors related to intrinsic motivation, while hygiene factors are extrinsic motivators, also called dissatisfaction-avoidance factors. According to Herzberg (1966) and Herzberg et al. (1993), hygiene factors are temporary motivators. Hygiene factors in work motivation include salary and benefits (Herzberg, 2008; Notz, 1975). This study examines athletic scholarships as an extrinsic reward. The extrinsic benefit of athletic scholarships is not tied to academic performance but rather to athletic ability and potential. Herzberg et al. (1993) warned, “An overemphasis on hygiene carries within itself the seeds of trouble. It can lead to greater focus on the extraneous rewards that reside in the context of jobs” (pp. 131-32). Medic et al. (2007) examined the dissatisfaction-avoidance notion of hygiene factors, finding scholarship athletes worried that losing their scholarship would limit their decision-making abilities, making their main responsibility now to pay for their educational expenses. Scholarship student-athletes in this study were examined through this theoretical framework as recipients of an extrinsic reward, and non-scholarship student-athletes were non-extrinsic.

In their classic study of a Division IA men’s basketball team, Adler and Adler (1985) learned how powerful media attention and emphasis on athletic ability was for revenue sport student-athletes. They found, The athletes received greater reinforcement for athletic performance than for academic performance. No one closely monitored their academic behavior, but they were carefully
watched at games, practices, booster functions, and on road trips. The celebrity and social status they derived from the media, boosters, and fans brought them immediate gratification, which in academe and with its emphasis on future rewards, could not offer. (Adler & Adler, 1985, p. 245).

Because athletic scholarships are usually awarded for athletic ability and not academic achievements, the extrinsic reward of money in the form of an athletic scholarship does not motivate performance for the academic responsibilities of a student on athletic scholarship.

Kingston et al. (2006) determined scholarship student-athletes exhibited significantly higher levels of extrinsic motivation and lower levels of intrinsic motivation towards accomplishments and stimulation than their non-scholarship counterparts did. Medic et al. (2007) found, “Full athletic scholarships can exert control over scholarship athletes’ behavior, and can also be perceived as potential controllers of non-scholarship athletes’ behavior, rather than the method than can provide incentive for an athlete’s effort and performance” (pp. 301-2). Several researchers (Gaston-Gayles & Hu, 2009; Kingston et al., 2006; Le Crom et al., 2009; Medic et al., 2007; Purdy et al., 1982) considered academic performance and scholarship status variables when examining the intrinsic motivation of student-athletes. Herzberg’s two-factor theory, including motivator factors towards intrinsic motivation, could be applied as a framework for a future study based on this literature. However, this study aimed to determine the influence of athletic scholarships as an extrinsic reward.

**Limitations**

There are several limitations to the study. The data samples are from select NCAA Division IA football institutions, all of which are large, public universities. Due to the size of the institutional sample, the data is not generalizable to all NCAA Division IA football institutions. However, it may be useful for comparable institutions to those studied. The study only examined 10 specific sports, including three men’s and seven women’s athletic teams. There are many other Division IA sports. Also, this study does not distinguish between student-athletes receiving partial athletic scholarships and those receiving full athletic scholarships. Finally, non-scholarship student-athletes who earn an athletic scholarship in a time between enrollment and graduation are still counted in the non-scholarship student-athlete group in this study.

**Conclusion**

Research on college student-athletes’ academic performance has been a compelling topic for decades. With more non-scholarship student-athletes competing in NCAA intercollegiate athletics than athletic scholarship recipients, the need for research on this important group emerged. This study contributed to the abundant research on student-athletes and academic performance by adding the context of recent NCAA policies and focusing on scholarship status as the major discriminating factor in the research, which have not been introduced in previous empirical studies. Results of this study showed that non-scholarship student-athletes were described by the variables of sport (Women’s Outdoor Track and Field), race (Asian, White), sport type (Individual), and sex (Female). Non-Scholarship student-athletes also had higher grade point averages than scholarship student-athletes. The scholarship student-athlete group was described by race (Black), sport (Football, Men’s Basketball, Women’s Basketball), sport
type (Team), and sex (Male). Scholarship student-athletes graduated in fewer semesters than non-scholarship student-athletes. This national study supports that scholarship status significantly differentiates student-athletes based on demographic and profile characteristics, academic performance, and time-to-degree. This study also allows for future research in many directions to continue investigating scholarship status, NCAA academic and graduation metrics, and motivation through the perspective of Herzberg’s two-factor theory.
References


