Journal of Issues in Intercollegiate Athletics

Volume 10 | Issue 1 Article 5

January 2017

Admissions Selectivity and Major Distribution in Big-Time College Football

Adam Love
University of Tennessee

Jim Watkins
Mississippi State Universit

Seungmo Kim
ong Kong Baptist University

Journal of Issues in Intercollegiate Athletics, 2017, 10, 1-16

Journal of Issues in Intercollegiate Athletics

Admissions Selectivity and Major Distribution in Big-Time College Football

Adam Love
University of Tennessee

Jim Watkins
Mississippi State University

Seungmo Kim
Hong Kong Baptist University

Given the fact that few college athletes go on to pursue careers in professional sport, it is important for them to gain meaningful value from their education to help them succeed in life beyond sport. The current study investigated one indicator of the extent to which student-athletes obtain an educational experience that is comparable to their non-athlete peers. Specifically, the current study examined (a) the distribution of football players' academic majors compared to that of the general student body and (b) how this distribution compared at universities with the most selective and least selective admissions standards in "big-time" college football. Results indicated that the distribution of football players' academic majors differed from that of the general study body both at institutions in the "most selective" and "least selective" groups. Football players were most frequently overrepresented in "social sciences" and underrepresented in "engineering" majors. Further, it appears that football players were overrepresented or underrepresented in academic areas of study more frequently at the "most selective" institutions. These results have relevant implications for university and athletics administrators, who should consider ways in which athletics programs could be structured to allow student-athletes to take advantage of the full range of academic programs offered at an institution.

As stated in the tagline of a memorable National Collegiate Athletic Association (NCAA, 2007) branding campaign, "there are over 380,000 student-athletes, and most of us go pro in something other than sports." Given this reality, it is important for college athletes to gain meaningful value from their education to help them succeed in careers beyond sport. The NCAA's rhetoric frequently highlights the importance of education. As stated by NCAA President Mark Emmert:

> The Association was founded on the notion of integrating athletics into the educational experience, and we have to make sure we deliver on that 100-year-old promise. We have to remind ourselves that this is about the young men and women we asked to come to our schools for a great educational experience. (NCAA, n.d., para. 11)

However, despite the NCAA's stated focus on education as paramount, a number of issues may compromise the ability of student-athletes to take full advantage of the academic opportunities available at their universities.

One factor that may restrict student-athletes' educational pursuits is the amount of time they must dedicate to sports. The 2015 Growth, Opportunities, Aspirations and Learning of Students in College (GOALS) survey, administered by the NCAA, indicated that Football Bowl Subdivision (FBS) players spend a median of 42 hours per week on their sport, up from 39 hours per week in 2010 (NCAA, 2016b). In a piece published by *The Players' Tribune*, former Duke University basketball standout Shane Battier (2016) lamented the fact that student-athletes have an off-season with workouts that are "voluntary" in name only, causing their time to be strictly budgeted down to the very last minute. Given these time demands, Battier suggested it's "hardly a secret" that student-athletes are often guided toward "easy" classes in the least demanding academic majors. In fact, a substantial body of academic research has identified the existence of "clustering" in which student-athletes are disproportionately overrepresented in certain academic majors (Case, Greer, & Brown, 1987; Fountain & Finley, 2009, 2011; Otto, 2010; Paule-Koba, 2015; Sanders & Hildenbrand, 2010; Schneider, Ross, & Fisher, 2010). Along these lines, the purpose of the current study was to investigate areas of study in which football student-athletes are most commonly overrepresented and underrepresented in comparison to the general student body. The results help scholars, sport administrators, and other stakeholders in college athletics consider one indicator of the extent to which student-athletes are able to gain full, meaningful value from their college educations.

Conceptual Background

Academic Integrity in College Athletics

Given the substantial time demands placed on student-athletes, the need for them to achieve certain academic performance standards to remain eligible for competition, and the emphasis placed on winning in college sport, it's little surprise that scholars and journalists have uncovered a long history of problems involving academic integrity in college athletics. During the 1903 season, only 3 of 23 players on the University of Chicago football team were full-time

students during the fall semester (Lester, 1999). During the 1940s, U.S. Military Academy head football coach Earl Blaik tolerated honor code violations committed by his football players until, in 1950, nearly the entire team was dismissed from West Point for obtaining copies of exams (Smith, 2011). In 2004, former University of Georgia assistant men's basketball coach Jim Harrick Jr. gave his students a final exam – the only exam in his "Coaching Principles and Strategies of Basketball" course – that asked rather basic questions such as "how many goals are on a basketball court?" (Johnston, 2004). In fact, three scholarship basketball players in the class did not even take the final exam, and all students in the course received A grades (Johnston, 2004). In 2011, reports surfaced that the Stanford University Athletic Academic Resource Center provided its athletes with a list of classes that were widely regarded as "easy" (Harris, 2011). Although there are many more cases that could be included here, these examples simply provide a brief illustration of the range of academic integrity issues that have long been associated with big-time college sport. As of January 2015, the NCAA was investigating allegations of academic misconduct on 20 separate college campuses (Wolverton, 2015).

Concerns about issues related to academic integrity in college sport have been a prominent topic of scholarly research (Benford, 2007; Ridpath, 2010). Notably, scholars have investigated the ways in which athletics can compromise student-athletes' educational experiences. For example, Adler and Adler (1985) reported that most athletes enter college with optimism and idealism about their academic pursuits, but their experiences on campus lead them to become detached from academics, abandoning their initial aspirations, and gradually resigning themselves to an inferior academic experience. Student-athletes who develop higher levels of athletic identity tend to perform more poorly in the classroom (Bimper, 2014). Of course, athletics departments provide services intended to support the academic pursuits of student-athletes. However, some student-athletes express frustration about being treated as though they are incapable of making decisions and feel they have a lack of autonomous choice in selecting their academic coursework (Hardin & Pate, 2013). Student-athletes often become progressively less satisfied over their careers with the guidance and planning services offered by their athletic academic centers, and many student-athletes may prefer receiving academic advising from a faculty advisor instead of their athletic counselor (Huml, Hancock, Bergman, 2014). Such findings raise concerns about the extent to which student-athletes are gaining a full, meaningful academic experience while they are in college.

Student-Athletes and Academic Majors

Numerous investigations by scholars and journalists have uncovered instances in which a disproportionately high number of student-athletes at a particular university are enrolled in the same major, which has often been referred to as "clustering." For instance, 58 out of 74 scholarship football players at the University of Michigan who identified an academic major were in general studies during the 2004 season, and 87 of the 176 total students enrolled in general studies were Michigan student-athletes (Heuser, Gershman, & Carty, 2008). In 2013, a curriculum review committee at Auburn University voted to eliminate the public administration major because they concluded that it added little to the university's academic mission (Cohen, 2015). At that time, more than half of the students majoring in public administration were student-athletes, and the Auburn athletics department offered to contribute funds for faculty and staff salaries, if necessary, to allow the university to continue offering the major (Cohen, 2015). Former University of North Carolina football player Michael McAdoo filed a lawsuit against UNC in 2014, claiming he was interested in a criminal justice major but was told by athletics

department staff to choose between exercise science, African American studies, and communications because these three majors would not conflict with his football responsibilities (Ganim, 2014). In the suit, McAdoo claimed the university did not fulfill its promise to provide him with a quality education. The existence of such cases raises clear concerns about the extent to which student-athletes are able to gain meaningful value from their education.

Scholarly research on clustering has verified its existence among football programs at the FBS level and throughout Division I Men's and Women's basketball. In an initial study on the topic, Case, Greer, and Brown (1987) defined clustering as occurring when 25% or more of the student-athletes on a team are pursuing the same academic major. Specifically, the authors found clustering to exist on 71% of men's basketball teams and 51% of women's basketball teams at the Division I level. Fountain and Finley (2009) examined the existence of clustering in the Atlantic Coast Conference (ACC), finding that every football program in the conference had at least 25% of players clustered into a particular major. Investigating football programs in the Big-12, Schneider et al. (2010) found that players were most commonly clustered into majors in the areas of "communications" and "social science." Otto (2012) reported that clustering existed at 7 of 10 football programs in the Pacific-10 Conference. Paule-Koba (2015), meanwhile, examined two years of data for Division I women's basketball programs and found that clustering existed on 44.5% of teams in 2008-09 and 29.8% of teams in 2009-10. Based on prior research, it appears that academic clustering has been relatively commonplace, particularly in the sport of football.

With respect to student-athletes' movement between majors during their time in college, Sanders and Hildenbrand (2010) reported that while some clustering was evident upon football players' entry to college, clustering intensified greatly over time. Specifically, student-athletes tended to migrate to clustered majors in the middle of their academic careers. Extending this longitudinal approach, Fountain and Finley (2011) similarly found that football players migrated into a single clustered major over time. In particular, players who began with a major listed as "general studies" tended to change to "Apparel, Housing, and Resource Management" by their third and fourth years with the football program. Overall, scholarly research on this topic has clearly demonstrated that student-athletes in particular sports tend to be clustered into certain majors on college campuses. Work such as that by Schneider et al. (2010) and Fountain and Finley (2011) indicates that the specific majors into which student-athletes are clustered may differ from campus to campus; although we must acknowledge the possibility that student-athletes could genuinely desire their specific major. The current study extends the work of scholars such as Otto (2010) and Schneider et al. (2010) by comparing the proportion of student-athletes in particular majors to that of the student body in general; specifically, we not only examine academic areas in which football student-athletes are overrepresented, but also areas in which they are underrepresented when compared to the general student body.

University Admissions Selectivity

Universities have widely varying admissions standards, and a student's athletic ability may be one factor considered in admissions decisions. This creates a situation in which certain institutions, particularly those with relatively high admissions standards, have many student-athletes entering the university with academic qualifications that are well below those of the typical member of the study body. Following an academic probe that led to several football players being dismissed for cheating, Notre Dame Head Coach Brian Kelly commented that few

of his football players would be able to gain admission to the university if it were not for their athletic talents:

> I think we recognized that all of my football players are [academically] at risk. All of them, really. Honestly, I don't know that any of our players would get into the school by themselves right now, with the academic standards the way they are. Maybe one or two of our players that are on scholarship. (Hansen, 2015, para. 25)

A similar situation seems to exist at many institutions involved in big-time college athletics. One of Joe Paterno's first acts as Pennsylvania State University athletic director was to ask the university president for nine "special admits," which constituted about one third of the football recruiting class (Smith, 2016, p. 106). With respect to the existence of "clustering" among student-athletes' academic majors, Case et al. (1987) found clustering to be more pronounced in men's and women's basketball at academically "elite" institutions. Of course, at institutions with relatively lower admissions standards, we may expect the need for "special admits" for student-athletes to be less common. Overall, given a long history of issues with academic integrity, the existence of academic "clustering" among student-athletes, and the possibility for student-athletes to be given special consideration in the admissions process, the current study investigated the following research questions:

> RQ1: How does the distribution of football players' academic majors compare to the distribution of academic majors in the general student body?
>
> RQ2: To what extent does this distribution differ at the most highly-selective and least selective institutions in "big-time" college football (i.e., Power Five conferences)?

Method

Data Collection

The current study focused on institutions in the "Power Five" conferences (plus Notre Dame), which constitutes a total of 65 universities. To categorize institutions according to admissions selectivity, the authors used the 2010 edition of the Carnegie Classification of Institutions of Higher Education and 2015 edition of the Princeton Review rankings, both of which were the most recent available at the time of data collection. Both the Carnegie Classification (Sweitzer, 2009) and the Princeton Review rankings (Volkwein & Sweitzer, 2006) have been examined as measures of admissions selectivity in previous research.

Specifically, the Carnegie Classification uses the distribution of entrance examination scores (i.e., ACT and/or SAT) for each institution's entering first-year students to determine a selectivity categorization ("Undergraduate Student Profile," n.d.). Of the 65 universities in our population, 52 were designated as "highly selective" in the Carnegie Classifications, while the remaining 13 were designated as just "selective." These 13 institutions were placed in the "least selective" group for analysis in the current study. The Princeton Review admissions selectivity ratings, which score each institution on a scale from 60-99 using factors such as entering first-year students' class ranks, standardized test scores, and high school grade-point averages; the percentage of students from out-of-state; and the percentage of applicants accepted ("The

Princeton," n.d.), were used to sort the remaining institutions. Of the remaining 52 institutions, 14 had a score of 95 or higher, and these 14 institutions were placed in the "most selective" group for analysis.

To collect data about student-athletes' majors, the investigators consulted media guides and player profiles from official athletic department websites. Data were recorded for every football student-athlete (excluding freshmen) that listed a declared major. Student-athletes with an undeclared major or with no major listed were not included in the data set. Further, true freshmen players were excluded due to the fact that media guides are generally published in advance of the football season; thus, most freshmen would likely not have completed any classes at the university at the time of media guide publication.

In order to compare football student-athletes with the general student body at each institution, data were collected from the Common Data Sets provided by each university. The Common Data Set initiative is a collaborative effort among data providers in higher education to "improve the quality and accuracy of information provided to all involved in a student's transition into higher education" (www.commondataset.org). One item included in the Common Data Sets is information about the number of degrees conferred in each disciplinary area according to Classification of Instructional Program (CIP) codes.

CIP codes were developed by the U.S. Department of Education's National Center for Education Statistics to provide a taxonomic scheme for the tracking and reporting of degree programs. The CIP system uses whole numbers as a "heading" for general areas of study and decimals to indicate specific degree programs. For example, the CIP number 14 represents the field of "Engineering," while the code for a degree in "Mechanical engineering" is 14.19. For the current study, student-athlete majors were grouped according to CIP headings (e.g., a major in 14.19 "Mechanical engineering" and 14.08 "Civil engineering" were both placed in the CIP category 14). This allowed us to focus on examining the subject areas in which student-athletes were most commonly (and least commonly) pursuing degrees. In addition, because majors may have different names at different institutions (e.g., a degree might be called "sport management" and one university and "sport administration" at another), the use of CIP codes facilitated comparison across a number of institutions.

Data Analysis

One of the 13 institutions initially placed in the "least selective" group did not provide any information about football student-athletes' majors, while one of the 14 "most selective" institutions did not participate in the Common Data Set initiative. Thus, these two institutions were excluded from the study, leaving a total of 12 institutions in the "least selective" group and 13 institutions in the "most selective" group for data analysis. To compare the distribution of football players' academic majors to that of the general student body, a cross-tabulation with the Chi-square test was performed using the data for each institution. Because a number of CIP categories for each institution had expected frequency counts of less than five with respect to the number of football players in a particular CIP category (Cochran, 1954), the current study used Monte Carlo simulation with 10,000 samples (i.e., confidence intervals of 99%) in order to obtain unbiased estimates of true *p* values, without the requirements of the asymptotic test (Currell, 2015). More specifically, Monte Carlo simulation refers to "a method of analysis based on artificially recreating a chance process (usually with a computer), running it many times, and

directly observing the results" (Barreto & Howland, 2005, p. 216). Through such a process, a Monte Carlo simulation can create an unbiased estimate of true *p* values.

When testing for significant differences between distributions in two groups (as was the case in the current study), a Chi-square test is commonly used on the basis of the asymptotic assumption. However, the assumption is likely to be violated when a data set is small, sparse, unbalanced, or poorly distributed. In such cases, however, the Monte Carlo simulation method can be used to provide unbiased estimates of true *p* values. As previously mentioned, numerous cells had expected frequencies of less than five in the current study, which indicated that the traditional Chi-square test was inappropriate (Schumacker & Tomek, 2013). Therefore, in order to identify cases in which significant differences existed with respect to the proportion of football student-athletes in a particular CIP category compared the general student body, the current study used the Monte Carlo simulation method, which is recommended for larger tables (Hilbe, 2004). Finally, to identify specific CIP categories in which football players were either overrepresented or underrepresented, the investigators examined adjusted residual values; values of greater than or equal to a magnitude of 2.0 indicate significant differences (Agresti, 2007).

Results

The results of the Monte Carlo simulation analysis indicated that the overall distributions of football players' majors were significantly different from those of the general student body at 11 of the 12 "least selective" institutions and all 13 of the "most selective" institutions. Specific CIP areas in which football student-athletes were over or underrepresented at these 11 institutions in the "least selective" group and 13 institutions in the "most selective" group are discussed in detail below (also see Table 1 for complete results).

Table 1

The frequency with which football players were underrepresented and overrepresented in each CIP category (number of instances/total number of institutions)

	Least Selective Institutions		**Most Selective Institutions**	
CIP Category	**Under-represented**	**Over-represented**	**Under-represented**	**Over-represented**
1 Agriculture, agriculture operations, & related sciences	1/6	1/6	-	-
3 Natural resources & conservation	0/9	0/9	1/9	0/9
4 Architecture & related services	0/8	0/8	0/8	1/8
5 Area, ethnic, cultural, gender & group studies	0/8	0/8	0/11	5/11
9 Communication, journalism, & related programs	0/11	2/11	0/9	5/9
11 Computer & information sciences & support services	0/10	0/10	3/13	0/13
12 Personal & culinary services	0/1	0/1	-	-
13 Education	3/10	0/10	0/6	0/6
14 Engineering	3/10	0/10	8/12	0/12
15 Engineering technologies & engineering-related fields	0/5	1/5	0/1	1/1
16 Foreign languages, literatures, & linguistics	0/11	0/11	0/13	0/13
19 Family & consumer sciences/human sciences	0/8	2/8	0/2	0/2
22 Legal professions & studies	0/1	0/1	0/3	1/3
23 English language & literature/letters	0/11	0/11	1/12	0/12
24 Liberal arts & sciences, general studies, & humanities	0/6	3/6	0/6	2/6
26 Biological & biomedical sciences	0/11	0/11	6/13	0/13
27 Mathematics & statistics	0/10	0/10	1/12	0/12
30 Multi/interdisciplinary studies	0/9	3/9	0/11	2/11
31 Parks, recreation, leisure, & fitness studies	0/7	3/7	0/5	3/5
38 Philosophy & religious studies	0/10	0/10	0/11	0/11
39 Theology & religious vocations	-	-	0/1	0/1
40 Physical sciences	0/11	0/11	1/13	0/13
41 Science technologies/technicians	0/1	0/1	-	-
42 Psychology	1/11	0/11	3/13	2/13
43 Homeland security, law enforcement, firefighting, & related protective services	0/4	3/4	-	-
44 Public administration & social service professions	0/10	0/10	0/10	1/10
45 Social sciences	0/11	5/11	0/13	8/13
47 Mechanic & repair technologies/technicians	0/1	0/1	-	-
49 Transportation & materials moving	0/1	0/1	-	-
50 Visual & performing arts	1/11	0/11	2/13	1/13
51 Health professions & related programs	4/11	1/11	2/10	0/10
52 Business, management, marketing, & related support services	0/11	3/11	1/10	4/10
54 History	0/11	0/11	0/13	2/13
TOTAL	13 instances in 256 CIP categories	27 instances in 256 CIP categories	29 instances in 253 CIP categories	38 instances in 253 CIP categories

Areas in Which Football Players Were Overrepresented

Football players were overrepresented in the following CIP categories at institutions in both the "least selective" and "most selective" groups: "communication, journalism, & related programs" (2 of 11 least selective institutions and 5 of 9 most selective institutions), "engineering technologies and engineering-related fields" (1/5 least selective and 1/1 most selective), "liberal arts and sciences, general studies, and humanities" (3/6 least selective and 2/6 most selective), "multi/interdisciplinary studies" (3/9 least selective and 2/11 most selective), "parks, recreation, leisure, and fitness studies" (3/7 least selective and 3/5 most selective), and "social sciences" (5/11 least selective and 8/13 most selective). Football players were overrepresented at only institutions in the "least selective" group in the CIP areas of "family and consumer sciences/human sciences" (2/8 least selective and 0/2 most selective) and "homeland security, law enforcement, firefighting, and related protective services" (3/4 least selective, offered at 0 most selective). On the other hand, football players were overrepresented in the following CIP areas only at institutions in the "most selective" group: "architecture and related services" (1/8 most selective and 0/8 least selective), "area, ethnic, cultural, gender, and group studies" (5/11 most selective and 0/8 least selective), "legal professions and studies" (1/3 most selective and 0/1 least selective), "public administration and social service professions" (1/10 most selective and 0/10 least selective), and "history" (2/13 most selective and 0/11 least selective). A summary of CIP categories in which football players were overrepresented in comparison to the general student body is provided in Table 2.

Table 2

Summary of CIP categories in which football players were overrepresented in comparison to the general student body (number of instances/total number of institutions)

CIP Category	**Least selective institutions**	**Most selective institutions**	**Total**
Social sciences	5/11	8/13	13/24
Communication, journalism, & related programs	2/11	5/9	7/20
Parks, recreation, leisure, & fitness studies	3/7	3/5	6/12
Liberal arts & sciences, general studies, & humanities	3/6	2/6	5/12
Area, ethnic, cultural, gender & group studies	0/8	5/11	5/19
Multi/interdisciplinary studies	3/9	2/11	5/20
Homeland security, law enforcement, firefighting, & related protective services	3/4	-	3/4
Engineering technologies & engineering-related fields	1/5	1/1	2/6
Family & consumer sciences/human sciences	2/8	0/2	2/10
History	0/11	2/13	2/24
Legal professions & studies	0/1	1/3	1/4
Architecture & related services	0/8	1/8	1/16
Public administration & social service professions	0/10	1/10	1/20

Areas in Which Football Players Were Underrepresented

The only CIP category in which football players were underrepresented at institutions in both the "least selective" and "most selective" groups was "engineering" (3 of 10 least selective institutions and 8 of 12 most selective institutions). Football players were underrepresented at only institutions in the "least selective" group in the CIP area of "education" (3/10 least selective and 0/6 most selective). In contrast, football players were underrepresented in the following CIP areas only at institutions in the "most selective" group: "natural resources and conservation" (1/9 most selective and 0/9 least selective), "computer and information sciences and support services" (3/13 most selective and 0/10 least selective), "English language and literature/letters" (1/12 most selective and 0/11 least selective), "biological and biomedical sciences" (6/13 most selective and 0/11 least selective), "mathematics and statistics" (1/12 most selective and 0/10 least selective), and "physical sciences" (1/13 most selective and 0/11 least selective). A summary of CIP categories in which football players were overrepresented in comparison to the general student body is provided in Table 3.

Table 3

Summary of CIP categories in which football players were underrepresented in comparison to the general student body (number of instances/total number of institutions)

CIP Category	**Least selective institutions**	**Most selective institutions**	**Total**
Engineering	3/10	8/12	11/22
Biological & biomedical sciences	0/11	6/13	6/24
Education	3/10	0/6	3/16
Computer & information sciences & support services	0/10	3/13	3/23
Natural resources & conservation	0/9	1/9	1/18
Mathematics & statistics	0/10	1/12	1/22
English language & literature/letters	0/11	1/12	1/23
Physical sciences	0/11	1/13	1/24

CIP Categories with Contradictory Results

We found contradictory results in four CIP categories. Specifically, football players were underrepresented at some institutions and overrepresented at others in "agriculture, agriculture operations, and related services" (underrepresented at 1/6 least selective, overrepresented at 1/6 least selective, offered at 0 most selective), "psychology" (underrepresented at 1/11 least selective and 3/13 most selective, but overrepresented at 2/13 most selective), "visual and performing arts" (underrepresented at 1/11 least selective and 2/13 most selective, but overrepresented at 1/13 most selective), and "business, management, marketing, and related support services" (overrepresented at 3/11 least selective and 4/10 most selective, but underrepresented at 1/10 most selective).

CIP Categories with no Significant Differences

In two CIP categories offered at multiple institutions, the proportion of football players did not differ to a significant extent from that of the general student body: "foreign languages, literatures, and linguistics" (0/11 least selective and 0/13 most selective) and "philosophy and religious studies (0/10 least selective and 0/11 most selective). In addition, there were no significant differences in the following CIP areas, all of which were offered at only one institution: "personal and culinary services" (0/1 least selective), "theology and religious studies" (0/1 most selective), "science technologies/technicians" (0/1 least selective), "mechanic and repair technologies/technicians" (0/1 least selective), and "transportation and materials moving" (0/1 least selective).

Comparison of "Most Selective" and "Least Selective" Institutions

As noted previously, the distribution of football players' majors was significantly different from that of the general student body at 11 of 12 institutions in the "least selective" group and all 13 institutions in the "most selective" group. Further, players were overrepresented in 38 of 253 total CIP categories (15.0%) among "most selective" institutions, compared to 27 of 256 total CIP categories (10.5%) among "least selective" institutions. Players were underrepresented in 29 of 253 total CIP categories (11.5%) among "most selective" institutions, compared to 13 of 256 total CIP categories (5.1%) among "least selective" institutions. Overall, these results suggest that the distribution of football student-athletes' academic majors departs from that of the general student body more frequently at highly-selective institutions.

Discussion

Football student-athletes were most frequently overrepresented in the "social sciences" category (13 of 24 institutions), followed by "communication, journalism, & related programs" (7 of 20 institutions), "parks, recreation, leisure, and fitness studies" (6 of 12 institutions), "liberal arts and sciences, general studies, and humanities" (5 of 12 institutions), and "multi/interdisciplinary studies" (5 of 20 institutions). Interestingly, football players were also frequently overrepresented in the "area, ethnic, cultural, gender, and group studies" category, but only at institutions in the "most selective" group (5/11 most selective and 0/8 least selective). Additionally, in the relatively rare cases where the category existed, football players were also frequently overrepresented in "homeland security, law enforcement, firefighting, and related protective services" (3 of 4 institutions, all of which were in the "least selective" group). The CIP category of "engineering," meanwhile, was the area in which football players were most commonly underrepresented (11 of 22 institutions); in particular, this seemed to be common at institutions in the "most selective" group (8 of 12 "most selective" institutions, compared to 3 of 10 "least selective" institutions).

With respect to contributions to the academic literature, the current study was the first to thoroughly investigate academic areas of study in which student-athletes are underrepresented in comparison to the general study body. A substantial body of research has determined that student-athletes in football and men's and women's basketball are often "clustered" into particular majors (Case et al., 1987; Fountain & Finley, 2009; 2011; Otto, 2012; Paule-Koba, 2015; Sanders & Hildenbrand, 2010; Schneider et al., 2010). Consistent with the current study, other investigations have found student-athletes frequently "clustered" into the social sciences (Sanders & Hildenbrand, 2010; Schneider et al., 2010). However, the current study also

identified areas in which football players were underrepresented relative to students in general. Being aware of the academic areas in which football student-athletes are underrepresented can help scholars and administrators investigate and understand constraints that may prevent student-athletes from having a more fully meaningful educational experience. For example, if the time demands of athletics prevent student-athletes from pursuing majors in the field of engineering, this can inform efforts to reform college sports. On the other hand, if scheduling conflicts are causing difficulties (i.e., certain courses are only available during practice times), university officials might work with athletic administrators in an effort to prevent such conflicts.

The current study was also the first to specifically investigate admissions selectivity and the over or underrepresentation of student-athletes in particular academic areas. At a general level, it appears common for the distribution of student-athletes' academic majors to differ from that of the general student body, regardless of a university's level of admissions selectivity. Indeed, football student-athletes were overrepresented and underrepresented in a number of academic areas both at institutions in the "most selective" and "least selective" groups. However, based on the results of the current study, it seems that football players are over or underrepresented in CIP categories more frequently at the "most selective" institutions. This finding is consistent with the results of Case et al. (1987), who reported that clustering in men's and women's basketball was more likely to occur at "elite" academic universities. The fact that particular academic challenges arise at more highly-selective institutions may not be surprising given the aforementioned situation described by Notre Dame Coach Brian Kelly, who suggested that few of his football players would be admitted to the university if not for their athletic skills. If a university admits a student-athlete with qualifications that are well below that of typical students at the university, then places substantial athletic time demands upon that student, it seems likely that the student-may face obstacles that prevent him/her from gaining a full, meaningful educational experience.

In addition, the current study also has relevant applications for administrators and other stakeholders in college athletics. Recognizing the academic areas in which student-athletes are commonly overrepresented and underrepresented can help us in considering the extent to which student-athletes are (or are not) taking full advantage of the educational opportunities presented by a scholarship. If certain areas exist in which student-athletes are generally unable to pursue academic majors (e.g., engineering fields), this highlights relevant questions about how meaningful the educational opportunities are that student-athletes have available to them. If athletics is playing a substantial role in limiting the academic pursuits of student-athletes, making the attainment of certain majors unrealistic, this raises important philosophical questions about the role of athletics on university campuses. At the very least, administrators, both in athletics and the university in general, should think further about how athletics might be structured in a way that lets "athletes be students" (Battier, 2016).

Limitations and Directions for Future Research

With respect to directions for future research, the current study took the innovative approach of using CIP categories as a systematic way of analyzing the distribution of student-athletes' academic majors and allowing for comparison between universities. This method facilitated investigation and comparison of the distribution of football players' areas of study at institutions with the most selective and least selective admissions standards. We suggest that the

use of CIP categories can be fruitful as a systematic way of investigating academic "clustering" across multiple institutions in future research.

Of course, the use of general CIP categories does carry some important limitations. For instance, by using general CIP categories, numerous specific majors (e.g., electrical engineering, chemical engineering, mechanical engineering) were grouped into broad categories (e.g., "Engineering"). In some cases, popular specific majors are likely to be grouped within larger academic programs. If an author's goal was to investigate why student-athletes were or were not pursing a specific major, the use of general CIP categories may oversimplify analysis. However, in such a case, researchers could make use of more detailed CIP codes (e.g., 14.19 "mechanical engineering" and 14.08 "civil engineering") rather than use general CIP categories. Therefore, one way of building upon the current study would be to use specific CIP codes to systematically collect and organize data about student-athletes' individual majors.

Readers should also be aware of limitations associated with assessing university admissions selectivity. Although the Carnegie Classification and Princeton Review rankings are both widely used, additional insight may be gained by measuring admissions selectivity with primary source data, such as the grade-point averages and test scores of incoming students. Because universities often provide "special admits" for student-athletes, future research could seek to directly measure how the academic qualifications and backgrounds of incoming student-athletes compare to those of incoming students in general at different types of institutions. Such an approach could provide further insight about factors that may affect the distribution of student-athletes' academic majors.

Finally, the current study investigated only one sport (i.e., football) at one level of competition (i.e., FBS), and future research could investigate the distribution of student-athletes' majors in Olympic sports and at other levels of competition (e.g., NCAA Division II and III). Such research could help determine the extent to which the demands of athletics limit student-athletes' choice of academic majors in a broader range of sports and at different levels of competition.

Conclusion

The results of the current study suggest that the distribution of football student-athletes' academic majors differs from that of the general study body both at institutions with the "most selective" and "least selective" admissions standards in big-time college football. Football players were most frequently overrepresented in "social sciences" and underrepresented in "engineering" majors. Further, it appears that the distribution of football players' academic majors differs from that of the general student body more frequently at the "most selective" institutions. The results of the current study lead the authors to suggest that certain factors may limit the ability of student-athletes to gain a full, meaningful educational experience that is comparable to that of their non-athlete peers. Notably, this may be a particular concern at more highly-selective institutions with big-time football programs. If the structure of athletics participation prevents or discourages student-athletes from pursuing the full range of academic programs offered at a university, this raises important questions for athletics administrators and university officials to consider.

References

Adler, P., & Adler, P.A. (1985). From idealism to pragmatic detachment: The academic performance of college athletes. *Sociology of Education*, *58*, 241-250. doi:10.2307/2112226

Agresti, A. (2007). *An introduction to categorical data analysis*. Hoboken, NJ: Willey.

Barreto, H., & Howland, F. (2005). *Introductory econometrics: Using Monte Carlo simulation with Microsoft excel*. Cambridge University Press.

Battier, S. (2016, October 24). Let athletes be students. *The Players' Tribune*. Retrieved from: http://www.theplayerstribune.com/shane-battier-ncaa-let-athletes-be-students/

Benford, R. D. (2007). The college sports reform movement: Reframing the "edutainment" industry. *The Sociological Quarterly*, *48*, 1-28. doi:10.1111/j.1533-8525.2007.00068.x

Bimper, A. Y. (2014). Game changers: The role athletic identity and racial identity play on academic performance. *Journal of College Student Development*, *55*, 795–807. doi:10.1353/csd.2014.0078

Case, B., Greer, S., & Brown, J. (1987). Academic clustering in athletics: Myth or reality? *Arena Review*, *11*(2), 48-56.

Cochran, W. (1954). Some methods for strengthening the common $\chi 2$ tests. *Biometrics, 10*(4), 417-451. doi:10.2307/3001616

Cohen, B. (2015, August 28). At Auburn, athletics and academics collide. *The Wall Street Journal*. Retrieved from: http://www.wsj.com/articles/at-auburn-athletics-and-academics-collide-1440635278

College Sport Research Institute. (2016). 2016 adjusted graduation gap report: NCAA FBS Football. Retrieved from: http://csri-sc.org/wp-content/uploads/2016/10/2016-Football-AGG-Report_Publish_Final_10-19-2016.pdf

Common Date Set Initiative (n.d.). Retrieved from http://www.commondataset.org/

Currell, G. (2015). *Scientific Data Analysis.* Oxford, UK: Oxford University Press.

Farrey, T. (2009, December 18). Seminoles helped by 'learning disabled' diagnoses. *ESPN*. Retrieved from: http://www.espn.com/espn/otl/news/story?id=4737281

Fountain, J., & Finley, P. (2009). Academic majors of upperclassmen football players in the Atlantic Coast Conference: An analysis of academic clustering comparing white and minority players. *Journal of Issues in Intercollegiate Athletics*, *2*, 1-13.

Fountain, J., & Finley, P. (2011). Academic clustering: A longitudinal analysis of a Division I football program. *Journal of Issues in Intercollegiate Athletics*, *4*, 24-41.

Ganim, S. (2014, December 10). Former UNC athlete sues school over academic scandal. *CNN*. Retrieved from: http://www.cnn.com/2014/11/07/us/unc-academic-scandal/index.html?hpt=hp_t2

Hansen, E. (2015, June 9). Notebook: Kelly considered bringing in grad transfer QB of his own to ND. *ND Insider*. Retrieved from: http://www.ndinsider.com/football/notebook-kelly-considered-bringing-in-grad-transfer-qb-of-his/article_9e402420-0f19-11e5-875a-239e4130ef5f.html

Hardin, R. & Pate, J. R. (2013). Playbook vs. textbook: Examining academic transitioning of NCAA Division I-FBS football student-athletes. *Journal for the Study of Sports and Athletes in Education, 7*, 229-244. doi:10.1179/1935739713Z.00000000014

Harris, A. (2011, March 9). Stanford athletes had access to list of 'easy' courses. *The Stanford Daily*. Retrieved from: http://www.stanforddaily.com/2011/03/09/1046687/

Heuser, J., Gershman, D. & Carty, J. (2008, March 18). University of Michigan athletes' "safe harbor" is general studies. *The Ann Arbor News*. Retrieved from: http://www.mlive.com/wolverines/academics/stories/index.ssf/2008/03/athletes_safe_harbor_is_genera.html

Hilbe, J. M. (2004). A review of SPSS 12.01, part 2. *The American Statistician*, *58*, 168-171. doi:10.1198/0003130043402

Hosick, M. B. (2015, November 4). Graduation success rate continues to climb. *NCAA.org*. Retrieved from: http://www.ncaa.org/about/resources/media-center/news/graduation-success-rate-continues-climb

Huml, M. R., Hancock, M. G., & Bergman, M. J. (2014). Additional support or extravagant cost? Student-athletes' perceptions on athletic academic centers. *Journal of Issues in Intercollegiate Athletics, 7*, 410–430.

Johnston, L. (2004, March 3). Ex-Georgia assistant's exam laughable; can you pass? *USA Today*. Retrieved from: http://usatoday30.usatoday.com/sports/college/mensbasketball/2004-03-03-harrick-exam_x.htm

Lester, R. (1999). *Stagg's university: The rise, decline, & fall of big-time football at Chicago*. Urbana, IL: University of Illinois Press.

National Collegiate Athletic Association. (2007). *NCAA launches latest public service announcements, introduces new student-focused website* [Press release]. Retrieved from: http://fs.ncaa.org/Docs/PressArchive/2007/Announcements/NCAA%2BLaunches%2BLatest%2BPublic%2BService%2BAnnouncements%2BIntroduces%2BNew%2BStudent-Focused%2BWebsite.html

National Collegiate Athletic Association. (2016a). Kalamazoo College Public Infractions Decision. Retrieved from: http://www.ncaa.org/sites/default/files/INF_KalamazooCollegePublicInfractionsDecision_20160322.pdf

National Collegiate Athletic Association. (2016b). NCAA GOALS study of the student-athlete experience: Initial summary of findings. Retrieved from: http://www.ncaa.org/sites/default/files/GOALS_2015_summary_jan2016_final_20160627.pdf

National Collegiate Athletic Association. (n.d.). Office of the President: On the Mark. Retrieved from: http://www.ncaa.org/about/who-we-are/office-president/office-president-mark

Otto, K. (2010). Demonstrating the importance of accuracy in reporting results of academic clustering. *Journal for the Study of Sports and Athletes in Education, 6*, 293-310. doi:10.1179/ssa.2012.6.3.293

Paule-Koba, A. (2015). Gaining equality in all the wrong areas: An analysis of academic clustering in Women's NCAA Division I basketball. *International Journal of Sport Management, 16*, 1-16.

Sanders, J. P., & Hildenbrand, K. (2010). Major concerns: A longitudinal analysis of student-athletes' academic majors in comparative perspective. Journal *of Intercollegiate Sport, 3*, 213–233. doi:10.1123/jis.3.2.213

Schneider, R. G., Ross, S. R., & Fisher, M. (2010). Academic clustering and major selection of intercollegiate student-athletes. *College Student Journal*, *44*, 64-70.

Schumacker, R., & Tomak, S. (2013). *Understanding Statistics Using R*. New York: Springer.

Smith, R. A. (2011). *Pay for play: A history of big-time college athletic reform*. Urbana, IL: University of Illinois Press.

Smith, R. A. (2016). *Wounded lions: Joe Paterno, Jerry Sandusky, and the crises in Penn State athletics*. Urbana, IL: University of Illinois Press.

Sweitzer, K. V. (2009). Institutional ambitions and athletic conference affiliation. *New Directions for Higher Education, 2009*(148), 55-63. doi:10.1002/he.368

The Princeton Review's College Ratings. (n.d.). *The Princeton Review*. Retrieved from: https://www.princetonreview.com/college-rankings/college-ratings

Undergraduate Student Profile Methodology. (n.d.). The Carnegie Classification of Institutions of Higher Education. Retrieved from: http://carnegieclassifications.iu.edu/methodology/ugrad_profile.php

Volkwein, J. F., & Sweitzer, K. V. (2006). Institutional prestige and reputation among research universities and liberal arts colleges. *Research in Higher Education, 47*, 129-148. doi:10.1007/s11162-005-8883-5

Wolverton, B. (2015, January 21). NCAA says it's investigating academic fraud at 20 colleges. *The Chronicle of Higher Education*. Retrieved from: http://www.chronicle.com/article/NCAA-Says-It-s-Investigating/151315/