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# Joining the Team: A Case Study Identifying and Assessing Critical Factors Influencing NCAA Division III Student-Athlete Matriculation

Daniel D. Covell  
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## Abstract

This research sought to understand what factors influence how first-year student-athletes at a National Collegiate Athletic Association (NCAA) Division III institution chose the school to attend in light of the heuristic perspective of bounded rationality, which posits that decision makers are rational in some but not all elements of the decision-making process. Data were assessed for the entire respondent group as well as subgroups based on gender and by amount of non-loan financial aid received by using the principal component analysis and the Mann-Whitney U test. The analysis showed athletic variables such as conference affiliation, quality of opponents, recruiting materials, and quality of the athletic website were important determining factors for the entire population group. This research provides the basis for a model for coaches to use to contact and encourage desired prospects to apply and matriculate.

**Keywords:** *Student-athletes, recruiting, NCAA Division III, decision making, matriculation*

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## Introduction

The applicable definition of the term *recruiting* is

any solicitation of a prospective student-athlete or a prospective student-athlete's relatives [or legal guardian(s)] by an institutional staff member or by a representative of the institution's athletic interests for the purposes of securing the prospective student-athlete's enrollment and ultimate participation in the institution's intercollegiate athletics program. (National Collegiate Athletic Association, 2008, p. 79)

The recruiting process is the culmination of years of effort on the part of prospects and their families as they participate on school and youth sports teams chasing the dream of an athletically related aid to subsidize their college educations, one that will only be realized by approximately 1 of every 81 high school senior girls and 1 of 93 senior boys participating annually. The average award is just over \$10,000, which could be as little as 20% of the cost of attendance at some schools. The competition among those seeking the \$1.4 billion annually awarded grants-in-aid is stiff, as there are 7.3 million boys and girls competing in high school sports, but just under 400,000 NCAA student-athletes, 123,000 of whom receive athletic aid (Pennington, 2008).

### Recruiting as Resource Acquisition

It can be argued recruiting is about resource acquisition. Student-athletes are one of the basic resources necessary for the maintenance of winning programs, and recruiting is the process through which programs obtain these vital resources. In fact, former NCAA president Myles Brand verified this concept in a 2006 speech before the National Press Club in Washington, D.C., when he told his audience, "The ability to compete successfully is tied to recruiting incoming student-athletes" (as cited in National Collegiate Athletic Association, 2006, p. 1).

This case study research endeavors to achieve an understanding of what characteristics and factors can be identified as most strongly influencing how a specific population of student-athletes chooses which college to attend from the perspective of strategic decision making. This research examines the college choice process for prospective student-athletes based on the heuristic perspective of bounded rationality, which posits decision makers are rational in some but not all elements of the process (Eisenhardt, 1989; Frederickson, 1985; Isenberg, 1986).

The significance of this research is based on the critical nature of attracting qualified prospects to opt to select one intercollegiate athletic participation opportunity over another, and it is difficult to understate how important it is for schools and programs to attract the most athletically proficient athletes possible so their programs may experience on-field success. To meet the charge stated above, this study examined responses obtained from first-year student-athletes

at a National Collegiate Athletic Association (NCAA) Division III classification institution so practitioners and researchers might gain an understanding of which factors are most influential in predicting matriculation. The participants used in this research, recently matriculated first-year student-athletes, allowed for the assessment of a range of factors that are substantially more controllable by the institution than those at Division I and II schools and also serve as keys to determining influencers in decision making. These subjects were selected as the focus of the study to eliminate the influence of factors such as athletically related aid (where prospects might select a school solely on the basis of whether he or she was awarded financial assistance based on athletic ability—a practice prohibited at NCAA Division III schools), the extent of national media coverage garnered by the school and its programs (a factor largely beyond the direct control of institutions), and potential future professional participation aspirations (a factor more likely to influence Division I and II student-athletes, and one where a potential future professional career is heavily dictated and determined by the managers of the professional leagues in which the prospect aspires to play).

Wins and losses do not carry the same financial import at Division III as at Division I, but attracting student-athletes and developing and maintaining winning programs is still important at the Division III level. In fact, noted sports historian Smith (2011) offered this perspective on the classification issue:

For the most part, the differences between (the divisions) are ones of degree, not generally of kind. With a few notable exceptions, the form of Division III athletics is similar to those of Division I. That is, there are professional coaches, professionalized recruiting, ... lengthy schedules; prolonged playing periods both daily and seasonally; play-offs and national championships; lowering of standards to bring less academically gifted athletes into the schools; “arms races” to build enticing athletic facilities; and a sports publicity office to carry the word to the alumni and general public. (pp. 6–7)

The NCAA’s separate three-tier divisional classification system, established in 1973, acknowledged the existing disparity in institutional mission and goals relating to intercollegiate athletics, created an opportunity for regular and postseason competition against similar schools, and established a more stratified approach to the awarding of athletically related financial assistance. Many fans and observers can identify the “big-time” intercollegiate programs—the ones that garner the lion’s share of public interest, media attention, and TV broadcast time. A close examination of the philosophy statements for each division clarified the specific difference between each divisional classification. In reviewing the divisional philosophy statements, the authors saw key points of distinction between the mission and goals of intercollegiate athletic programs. Certain Division I programs,

specifically football and men's basketball, are expected to generate revenues sufficient enough to fund the operation of the rest of the athletic department offerings. Division III programs give primary emphasis to regional in-season competition and conference championships. Division I programs are expected to provide spectator-oriented offerings, and Division III programs are run first and foremost for the benefit of the participants.

However, financial implications are attached to attracting student-athletes at the Division III level, for example, the case of Adrian College (Michigan), a private, coeducational college of liberal arts and sciences related to the United Methodist Church founded in 1859, self-described as a traditional 4-year, residential college that focuses completely on undergraduate education. Over the past several years, the school has undergone a transformation, which has been attributed to an emphasis on its intercollegiate athletic programs. The school has added or upgraded athletic facilities, including an ice arena, football and baseball stadiums, a track, and a dozen tennis courts; added five varsity and six club teams; and hired 11 full-time head coaches in an effort to raise its enrollment. The efforts have been more than successful; the school has grown 57% since 2005 (when enrollment was 935) to a total of 1,470 students. Nearly half of the 581 first-year students that enrolled in 2008—the largest in the school's history—were varsity athletes. The school has also become more selective, accepting 72% of its 4,200 applicants, compared to 93% of the 1,200 who applied in 2005, and faculty report the academic caliber of students has improved. The tuition dollars generated by this growth have allowed the school to fund needed renovations to academic buildings, increase its operating budget from \$23 million to \$43 million, and to hire 16 tenure-track faculty members (Sander, 2008).

The decision of what sports to add was not made randomly. Both ice hockey and lacrosse recruits tend to come from more affluent families. The school's Michigan location places it in a region with strong youth and high school hockey, even though there is only one other Division III men's and women's program in the state (at Findlandia University in Hancock, on the state's upper peninsula). Although the United States' lacrosse hotbeds are located in New England and in sections of New York state and the Mid-Atlantic, the sport is growing in suburban Michigan and across the country, and the state has no other Division III lacrosse programs. According to Richard Creehan, Adrian executive vice president, "Because we're the only program in the state, we're getting all the (Michigan) kids ... they want to continue to play. What we're saying is, 'You can continue to do that here'" (as cited in Sander, 2008, pp. 2–3).

According to Jeffrey Docking, Adrian president, who assumed the post in 2005 and was a driving force behind this initiative, the plan was enacted for the good of enrollment and the future of the college. "The use of athletics to drive enrollment," he said, could well be "the fountain of youth for small liberal-arts colleges" (as cited in Sander, 2008, p. 1). When he took office, the school was in

good fiscal health, but enrollment was down, with three residence halls closed and the open ones in disrepair, all of which hurt the school's ability to retain students. The state's economy was also struggling, with the highest unemployment rate in the country, and the college's tuition—then \$24,800, now \$31,000—was well above the state-supported schools to which prospective students also applied. To attract students, the school decided to offer extracurricular intercollegiate athletic programs that students were not able to attain at the in-state Division I competitor schools such as Central Michigan University, Michigan State University, Wayne State University, and Western Michigan University. The school sought to raise \$30 million—half raised from donors, the rest borrowed—to expand its athletic programs. The current athletic department operating budget has also grown from \$300,000 in 2005 to \$800,000 in 2008–2009 (Sander, 2008).

Coaches are responsible for contributing to enrollment efforts as well, with a quota system in place requiring each sport to bring in a specific number of student-athletes each year (football: 50; men's and women's ice hockey: 24; men's and women's cross country and track and field: 18; men's and women's lacrosse: 17; men's and women's soccer: 17; men's and women's basketball: 12; women's bowling: 12; baseball: 10; men's and women's golf: eight; men's and women's tennis: eight; softball: six). If these quotas are not met, they will not be rehired. Staff members who supervise other programs such as the student newspaper and marching band are also required to recruit collectively an annual total of 40 students. According to recently hired men's lacrosse coach, Chris Delfausse, "It's a plan that works for people who love their jobs and want to be successful." He added,

[Coaches there] are attuned to what their message is and what their goals are, so it works out ... In the first year, I don't think I called a kid in Maryland or New York or Massachusetts. Now we're actively going after more of the Maryland kids. It's still a long shot, but more kids are listening. (as cited in Sander, 2008, p. 4)

In support of these efforts, recruiting budgets have grown from just under \$3,000 in 2005 to \$31,000 in 2008–2009 (Sander, 2008).

Given the financial implications at Division III, the pressure to recruit and convince prospects to matriculate exists, as well as increased expectations from prospects and their families. Haverford College, a private school with 1,200 undergraduates located near Philadelphia, Pennsylvania, where nearly 40% of students participate in varsity sports and recruited athletes make up about 15% of each incoming class, feels this pressure. Athletic Director Greg Kannerstein (who has also served as acting dean of admissions at the school) said, "The nature of the process gets more organized every year. The parents are more savvy, the athletes are more polished, the institutions more meticulous" (Pennington, 2006, p. 8-1). Haverford's women's volleyball coach, Amy Bergin, related her approach to the process:

Of 1,000 I contacted, about half will reply. About half that reply will be academically qualified. About half of them will be truly interested in Haverford. About half of them will be actually good enough to play volleyball for us. About half of that group will apply for admission. About half of them will get accepted. And about half of them will decide to come here. If that happens, that's a really good year. That's almost eight girls (Pennington, 2006, p. 8-6).

To achieve this goal, Bergin spends her summer evenings calling prospects and seldom travels anywhere without her three-ring binder containing her contact list database printout. Each time she contacts a prospect—some she has called five times—she notes the date of the conversation and what was discussed in the prospect's file so as to not repeat herself. Speaking of her conversations, Bergin related, "There are the girls who say, 'I'm a Division I talent.' And I think, 'Forget it. I don't need the attitude.'" Speaking of the game videos sent to her by prospects (some done by for-profit recruiting services), Bergin said, "You just laugh at some of the professional videos I get with their Hollywood special effects. It's so unnecessary ... I've seen enough girls hitting balls as 'Eye of the Tiger' plays in the background to last a lifetime" (Pennington, 2006, p. 8-6).

## Literature Review

### Strategic Decision Making

Mintzberg, Raisinghani, and Theoret (1976) defined strategic decisions as "important, in terms of the actions taken, the resources committed, or the precedents set" (p. 284). Furthermore, the common model of rational action holds human behavior has some purpose (Allison, 1971; March & Simon, 1958). Eisenhardt and Zbaracki (1992) suggested the existence of three major decision-making paradigms: rationality and bounded rationality, politics and power, and garbage can.

### Rationality and Bounded Rationality Models

The rational action model suggests decision makers enter decision situations with known objectives (Anderson, 1983; Nutt, 1976, 1984). These objectives determine the value and possible consequences of an action. The actors gather appropriate information, determine alternatives, and select the optimal alternative. Eisenhardt and Zbaracki (1992) suggested Simon's (1965) identification, development, and selection model is a core example of this model.

The generally accepted "bounded rationality" model claims that there are cognitive limits to rational decision making and that many decisions follow the basic phases of problem identification, development, and selection. However, Eisenhardt and Zbaracki (1992) claimed there is no single theory of bounded rationality. In addition, they cited that many researchers suggest decision processes are often "boundedly rational and so seek to improve the rationality, often by seeking

more information” (p. 21) and that recent research suggests a “heuristic” perspective of bounded rationality, which posits that decision makers are rational in some but not all elements of the process (Eisenhardt, 1989; Frederickson, 1985; Isenberg, 1986). It is argued such perspectives are effective, particularly in certain environments that are uncertain and ever changing. This research sought to review the college choice process for prospective student-athletes from the heuristic perspective on decision making, where decisions are made to attend a school based on both rational and boundedly rational factors such as intuition or the seeking of many rational factors but allowing a few to influence the final decision.

### **Studies Pertaining to Recruiting and Student Decision Making**

Specific research examining the college selection process for matriculants is an area that has been examined in a few studies, but, as noted by Bateman and Spruill (1996), “is an important, and largely untapped, area which can be used to influence enrollment” (p. 185). Most of the existing research focuses on the process through which students decide on which college to attend, and other studies examine the influences on this process. Few of these existing studies focus on student-athletes as subjects.

According to Hossler, Braxton, and Coopersmith (1989), three basic college choice models exist that attempt to account for the factors students assess during their decision-making process: econometric models (as evidenced by Fuller, Manski, & Wise, 1982, where students base their choices on geographic location, academic factors, and the perceived economic benefit or financial rate of return of pursuing a degree, as well as on background, social context, and academic experiences of family members), sociological models, which evaluate social and individual factors relating to educational aspirations and the associated status of positions or occupations acquired through attendance), and combined models (executed by Hossler & Gallagher, 1987, and Litten, 1982, which combine both econometric and sociological concepts to determine the most powerful indicators to provide guidance to institutional decision makers). Combined models are described as desirable because they use a wider range of variables. In these combined model cases, Litten (1982) focused on personal and social phenomenon that influence the choice process and divided the process into three stages. Five categories of variables influence Stage 1: background, personal attributes, high school attributes, student performance, environment. Stages 2 and 3 include four additional categories: influences, public policy, college actions, college characteristics. Hossler and Gallagher (1987) sought to track data that will allow institutional administrators to exert more influence on the choice process. This research also identified three stages in the process: In Stage 1 (predisposition), students determine whether they will seek college admission, Stage 2 is dedicated to searching for school information, and Stage 3 focuses on information evaluation. According to the Hossler and Gallagher, Stage 1 is influenced by sociological factors, and the latter two are influenced by econometric variables.



Other studies have also examined the existence of separate stages in the choice process and can be considered combined models. Cabrera and La Nasa (2000) offered a condensed three-stage model much like that of Hossler and Gallagher (1987), aligning the stages with specific grade levels and noting Stages 1 (Grades 7–9) and 2 (the search stage, which can go into Grade 12) are heavily influenced by parental involvement factors of motivation (the expectation of high academic achievement) and proactive parenting (where parents discuss college plans with their children, save for college, and become involved in school matters). They tended to emphasize econometric factors in each stage, especially Stage 3 (choice), such as tuition and financial aid. To this end, they noted school choice is linked to student socioeconomic status. An additional study that assesses the search process as segmented by stages is by Moogan, Baron, and Harris (1999), who suggested a five-stage model (problem recognition, information search, evaluation of alternatives, purchase, post-purchase evaluation). Key econometric factors in Stage 3 included school location and facilities.

Another study in this area that focuses on a combined model of a staged choice process with less comparable subject groups is by Mazzarol and Soutar (2002), who examined the factors that influence students to undertake international study. Mazzarol and Soutar identified three stages for these students (decision to study abroad, selection of a host country, selection of an institution within the host country), with both econometric and sociological factors influencing each stage. Another study with a less comparable subject group is by Schleeff (2000), who examined professional graduate school attendees and concluded econometric factors such as salary increases after program completion as well as combined factors (described by Schleeff, 2000, as “class related constraints” such as “prestige” and “lifestyle,” p. 155) influenced the choice of school. Parents played a significant role with these subjects as well by communicating that such a path would help attain the desired social status. One specific study that examined subjects in more applicable methods is by Canale, Dunlap, Britt, and Donahue (1996) who determined econometric factors such as cost, teacher attributes, and perceived academic reputation were ranked most important.

A review of this body of research indicated the existence of a degree or continuum of heuristic decision making in each of the studies. The literature on college choice has identified two main factors—econometric and sociological—as important, but each study identified a different set of determining variables based on the study participants and environments in which the decisions were being made. For example, influencing factors varied depending on the stage in which the choice process was assessed and measured, indicating the influence and immiscibility of environmental factors. In addition, although each study focused on the general factor categories, specific elements in each category were more influential than others depending on the participant group and the environments in which they were operating.

## Method

As noted above, this case study examined responses obtained from first-year student-athletes at a National Collegiate Athletic Association (NCAA) Division III classification institution. The institution is located in the northeastern United States, is private and coeducational, has a full-time undergraduate population of approximately 2,500 (the majority of whom live on campus), and awards both bachelor's and master's degrees in the liberal arts, business, and engineering. In an effort to collect data as close to the decision-making process as possible, all first-year prospective student-athletes at the school completed the printed survey by hand as administered by the authors of this study as a part of preseason meetings 2 weeks before the beginning of fall semester classes. Out of a population of 218, 194 usable surveys (88.9%) were collected. A test survey had been administered to small groups of current student-athletes at the school the previous fall to gauge question clarity and factor appropriateness.

The authors developed the questionnaire based on the theoretical constructs and findings discussed above. As outlined by Bateman and Spruill (1996), one strength of this research, like that of Litten's (1982), is the identification of segments within the first-year student-athlete pool (i.e., sport, gender, financial aid, prospective choice of major) provides greater detail into understanding the influence factors. Therefore, the model constructed through this research is classified as a combined model, which as described above is desirable based on the inclusion of a wider range of assessed variables, and combines both econometric and sociological concepts to determine the most powerful indicators to provide guidance to institutional decision makers. In addition, combined models are described as desirable because they use a wider range of variables. This research does not focus on various stages of decision making, but rather relies on data supplied after the participants have chosen the school and matriculated.

The questionnaire is divided into two main sections. Part I asks respondents to answer basic demographic questions pertaining to gender, type of high school attended, planned sport(s) of participation, level of financial assistance received, the nature of contact received from the school's coaching staff, and whether a family member had attended the school. Part II of the survey consisted of 28 questions divided into five sections: physical, academic, family/friend, financial aid, and athletic. These questions also addressed the charge to create a combined research model that assessed both econometric factors (i.e., geographic location, academic factors, the perceived economic benefit or financial rate of return of pursuing a degree, family background, social context, and academic experiences) and sociological factors (i.e., educational aspirations and the associated status of positions or occupations acquired through attendance).

The data collected were scales from 1 to 5, making the data ordinal. Although factor analysis is intended for interval scale data (which assume the difference between a 1 and a 2 is the same as the difference between a 3 and a 4 response),

many researchers also use the technique to analyze ordinal data, especially survey responses. The ordinal level is a ranking scale in which the differences between ranks are not necessarily equal. The Likert scale used in many surveys (*strongly agree, agree, disagree, strongly disagree*) in which the responses are assigned a numerical value is an example of ordinal measurement. Exploratory factor analysis was employed to discover simple patterns in the relationships and to uncover the underlying structure of the 28 variables by analyzing the correlations that exist between variables. It is recommended the determinant of the correlation matrix be at least .00001 to avoid multicollinearity (Tabachnick & Fidell, 2000). The determinant of the complete correlation matrix for these data is .00000366, which does not exceed the minimum value needed.

Two additional checks used were the Kaiser-Meyer-Olin (KMO) statistic and Bartlett's test of sphericity. The KMO statistic is .808 for these data. Values between .8 and .9 are classified as "great" (SPSS, 2008). Bartlett's measure tests the null hypothesis that the original matrix is an identity matrix. For factor analysis to work, there needs to be some relationship between the variables. Therefore,  $p$ -value test significance must be less than .05. For these data, the Bartlett's test  $p$ -value is  $p < .001$ . Finally, the alpha (Cronbach) measure of internal consistency, based on the average inter-item correlation is .856, which is strong. Based on the above diagnostics, it appears factor analysis is appropriate for these data. Two variables were eliminated (the amount of non-loan financial aid and the question about parents attending the school). These variables were eliminated because few respondents answered these questions. The resultant determinant of the correlation matrix for the remaining 26 variables was .00001297, above the minimum of .00001.

Two main decisions needed to be made with regard to the method of extraction. The first was whether to use principal component analysis (PCA) or principal axis factoring (PAF), the latter of which was generally meant by the term *factor analysis*. The main difference between these two methods pertains to assumptions made about variance, although the results are often similar. The underlying model for both methods is reflected in the following equation:

$$\text{Total variance} = \text{common variance} + \text{unique variance}$$

In PCA, both common and unique variance are analyzed. This makes the implicit assumption that the test or instrument used to measure the variable is without error. In PAF, only the common or shared variance is analyzed. For these data, PCA was employed.

The second major decision concerned the number of factors to be extracted. Kaiser's criterion is used to select those factors which have an eigenvalue greater than 1. This means a factor that explains less variance than a single variable is excluded. It is suggested this criterion be used when the number of variables is less than 30 and the average communality is greater than .70, as is the case with this

research, which yielded seven factors. A second way of determining the number of factors is the Scree test, which involves a visual inspection of the graph of descending variance accounted for by the factors. Factors to be retained are those that lie before the point at which the eigenvalues seem to level off. For these data, the Scree test leads to using four factors. Models were developed for four and seven factors.

After the factors are extracted, it is often useful to rotate the factors. Rotation typically clarifies the factor structure and evens out the loadings on the factors. The simplest structure for these data that explained the most variance was found using PCA, extracting seven factors. The results are summarized in Table 1.

**Table 1**

*Summary of Factor Analysis: Principle Components Analysis*

Total percentage of explained variance	65.034
Total percentage of variance explained	
Factor 1 (Athletics 9, 10, 11, 12)	23.565
Factor 2 (Family 4, 5, 6, 8)	13.014
Factor 3 (Physical 1, 2, 3, 4)	8.693
Factor 4 (Athletic 1, 2, 3, 4, 8)	6.117
Factor 5 (Athletics 5, 6)	4.763
Factor 6 (Family 1, 3, 7, Athletics 7)	4.518
Factor 7 (Academics 1, 2)	4.363

*Note.* Factors not loaded (> .40): Academics 3.

## Results

Of the 193 respondents who opted to complete Part I of the survey, 54 (28%) were female and 139 (72%) were male. The overwhelming majority (85.4%) attended public high schools. Slightly over half (52.8%) indicated their first contact from the school was from a member of the coaching staff. Only 9% of the respondents had a family member attend the school. Respondents hailed from 12 different states, with 78.8% coming from the state in which the school is located and two bordering states (a representation that is consistent with that of the overall student body). As for the reporting of prospective major or area of study, nearly half (49.7%) listed those in the College of Business, 40.4% in the College of Arts and Science, and 9.8% in the College of Engineering.

In regard to information concerning the sport(s) in which the respondents planned to participate, respondents were allowed to report up to three sports. Only 20 indicated they hoped to participate in two, and only one reported three. These data confirm the trend of specialization in sport participation occurring at the high school level. Therefore, for the remainder of the analysis, only the first sport listed is taken into consideration. The three highest male sports reported were football (48: 24.7% of the overall population, 34.5% of the male population), baseball (24: 12.4% of the overall population, 17.3% of the male population), and soccer (20: 10.3% of the overall population, 14.4% of the male population), and the three highest female sports were softball (12: 6.2% of the overall population, 22.2% of the female population); field hockey (seven: 3.6% of the overall population, of the female population 13%); and basketball, lacrosse, and soccer (six each: 3.1% of the overall population, of the female population 11.1%). These numbers also support the general different intercollegiate athletic participation rates between males and females, which are also influenced by large football squad sizes.

### **Analysis of Variables Influencing College Choice**

For this study, each of the 28 factors scored by the respondents in Part II of the questionnaire was analyzed. The variable with the highest mean evaluation by respondents was Question 1 in the academic grouping (the school offered the major(s) in which I am interested). Question 4 in the physical grouping (the general appearance of the campus) was the only variable with an average rating higher than 4. The element with the lowest overall mean evaluation was Question 2 in the family/friends influences (my parents attended the school). On a scale of 3 as an indication of moderate influence, all of the physical and academic variables were rated, on average, as having more than a moderate influence. Neither the family/friend influences nor the financial aid characteristics was, on average, rated higher than 3.

### **Comparisons Between Subgroups**

The authors sought to determine whether subgroups (as determined by gender, level of non-loan financial aid, major, and sport) valued certain factors differently. Because the data is ordinal, it is typically advisable to forgo the *t* test and use its non-parametric alternative, the Mann-Whitney U test. The only assumptions of this test are the two samples are random and independently drawn; the dependent variable (e.g., extent to which the element was present) is intrinsically continuous, capable in principle, if not practice, of producing measures carried out to the *n*th decimal place; and the measures within the two samples have the properties of at least an ordinal scale of measurement, so it is meaningful to speak of “greater than,” “less than,” and “equal to” (Conover, 1980).

The Mann-Whitney U test is the most popular of the two independent sample tests. It is equivalent to the Wilcoxon rank sum test and the Kruskal-Wallis test for two groups. Mann-Whitney tests that two sample populations are equivalent

in location. The observations from both groups are combined and ranked, with the average rank assigned in the case of ties. The number of ties should be small relative to the total number of observations. If the populations are identical in location, the ranks should be randomly mixed between the two samples. The number of times a score from Group 1 precedes a score from Group 2 and the number of times a score from Group 2 precedes a score from Group 1 are calculated. The Mann-Whitney U statistic is the smaller of these two numbers (Conover, 1980).

Table 2 shows the summary results of the responses for male and female respondents. Statistically significant differences were found for 10 of the 28 variables. However, three of these 10 variables have average ratings below 2, so although the responses are different based on gender, the overall rating of these three variables is too low. This leaves seven important variables based on gender differences: physical variables 1, 2, and 4; academic variables 2 and 3; and athletic variables 2 and 5.

**Table 2**

*Summary of Part II Factors Based on Gender*

Factor	Male	Female	P value
<b>Physical</b>			
1) It was my preferred distance from home	3.16	3.81	< .001*
2) It was in the type of community I preferred	3.42	3.89	0.002*
3) Of the quality of the residential dorms	3.15	3.43	0.076
4) Of the general appearance of the campus	4.03	4.33	0.077
<b>Academic</b>			
1) The school offered the major(s) in which I am interested	4.35	4.38	0.148
2) Of the perceived quality or reputation of the school	3.61	4.19	< .001*
3) Of the size of the undergraduate population/enrollment	3.23	3.80	0.002
<b>Family/Friend Influences</b>			
1) My parents thought it was the best choice for me	2.88	2.94	0.609
2) My parents attended the school	1.20	1.09	0.436
3) Of the opinion of my friends or peers	1.86	1.59	0.054
4) My friends or peers are attending the school	1.88	1.41	0.007*
5) My high school teammates are attending the school	1.54	1.06	< .001*

**Table 2(cont.)**

<b>Factor</b>	<b>Male</b>	<b>Female</b>	<b>P value</b>
<b>Family/Friend Influences</b>			
6) Of the opinion of my high school teammates	1.48	1.37	0.311
7) Of the opinion of my immediate family members	2.33	2.50	0.409
8) Other immediate family members attended the school	1.43	1.26	0.188
<b>Financial Aid</b>			
1) Of the amount of non-loan financial aid that I received	2.86	3.09	0.329
<b>Athletic</b>			
1) Of the quality of the athletic program(s) in general	3.65	3.87	0.077
2) Of the quality of my specific athletic program(s)	3.77	4.07	0.032*
3) Of the chance of significant playing time	3.27	3.13	0.537
4) Of communications with the head coach	3.27	3.48	0.194
5) Of communications with assistant coaches	2.64	2.13	0.007*
6) Of my communications with current student-athletes	2.52	2.70	0.438
7) Of my communications with alumni of the school	1.95	1.57	0.015*
8) Of the quality of the head coach	3.78	3.85	0.533
9) Of the conference affiliation	2.80	2.91	0.409
10) Of the quality of the opponents	2.79	2.85	0.507
11) Of the recruiting materials I received (brochures, programs)	2.83	3.02	0.238
12) Of the quality of the Athletics website	2.71	2.83	0.467

\*Denotes significant at the .05 level.

The next part of the analysis considered whether there were significant differences in the variable ratings based on the amount of non-loan financial aid received. To complete this analysis, the authors divided the responses into two groups based on the answer to Question 6 in Part I of the questionnaire, which asked respondents to indicate the amount of non-loan financial aid received from the school. The authors divided the respondents into two groups: those who re-

ceived \$5,000 or less in aid (70 total) and those who received more than \$5,000 (108 total). Sixteen chose not to answer this question and were omitted from this part of the analysis. Table 3 shows the summary results of the responses for this part of the research. Only four variables tested significantly different, although none had an average rating greater than 3.

As noted above, the questionnaire included an open-ended question to collect responses as to prospective choice of major field of study. The authors mapped each of these responses to one of the three undergraduate schools at the institution to examine the ratings of the variables by prospective major. The Kruskal-Wallis ANOVA test was used. None of the physical or academic variables tested significantly different by school. Four of the family/friends influences tested differently by school, but none had an average rating above 3.

In comparing the ratings of the variables based on choice of sport, the authors opted to examine only the six sports (baseball, football, men's ice hockey, men's lacrosse, men's soccer, softball) that had 10 or more reported participants. However, because five of these sports were male teams, and gender-based analyses had been previously performed, the authors elected to run the comparison for the five male teams (which totaled 120 respondents) using a Kruskal-Wallis test. There were no significant differences in the rating of any physical, academic, family/friends, or financial aid variables by sport.

## Discussion

As noted above, this research method is classified as a combined model, which combines both econometric and sociological concepts to determine the most powerful indicators to provide guidance to institutional decision makers. As described above, this method is desirable based on the inclusion of a wider range of assessed variables and combines both econometric and sociological concepts to determine the most powerful indicators to provide guidance to institutional decision makers. In addition, combined models are described as desirable because they use a wider range of variables. This study contributes to the combined model by investigating sociological (aspirations and the associated status of positions or occupations acquired through attendance) and econometric factors (geographic location, academic factors, and the perceived economic benefit or financial rate of return of pursuing a degree, as well as the background, social context, and academic experiences of family members).

As outlined in the Method section, Part II of the survey consisted of 28 questions divided into five sections: physical, academic, family/friend, financial aid, and athletic. The data analysis outlined above showed for the entire population group, athletic variables 9 (conference affiliation), 10 (quality of opponents), 11 (recruiting materials), and 12 (the quality of the athletic website) together explained 23.565 of the variance based on the analysis. In addition, athletic variables 1 (the quality of the athletic program[s] in general), 2 (the quality of the prospect's specific athletic program[s]), 3 (the chance for significant playing time), 4 (com-



**Table 3***Summary of Part II Factors Based on Amount of Non-Loan Financial Aid*

<b>Factor</b>	<b>\$5,000 or less (Responses A, B, C)</b>	<b>More than \$5,000 (Responses D, E, F)</b>	<b>P value</b>
<b>Physical</b>			
1) It was my preferred distance from home	3.34	3.31	0.877
2) It was in the type of community I preferred	3.61	3.46	0.390
3) Of the quality of the residential dorms	3.33	3.14	0.249
4) Of the general appearance of the campus	4.17	4.06	0.415
<b>Academic</b>			
1) The school offered the major(s) in which I am interested	4.41	4.34	0.627
2) Of the perceived quality or reputation of the school	3.73	3.81	0.670
3) Of the size of the undergraduate population/enrollment	3.43	3.34	0.702
<b>Family/Friends Influences</b>			
1) My parents thought it was the best choice for me	2.91	2.88	0.842
2) My parents attended the school	1.28	1.11	0.143
3) Of the opinion of my friends or peers	1.87	1.75	0.366
4) My friends or peers are attending the school	1.83	1.69	0.252
5) My high school teammates are attending the school	1.56	1.31	0.015*
6) Of the opinion of my high school teammates	1.66	1.34	0.044*
7) Of the opinion of my immediate family members	2.46	2.31	0.451
8) Other immediate family members attended the school	1.49	1.36	0.548

**Table 3 (cont.)**

<b>Factor</b>	<b>\$5,000 or less (Responses A, B, C)</b>	<b>More than \$5,000 (Responses D, E, F)</b>	<b>P value</b>
<b>Financial Aid Factors</b>			
1) Of the amount of non-loan financial aid that I received	2.03	3.67	< .001*
<b>Athletic Factors</b>			
1) Of the quality of the athletic program(s) in general	3.73	3.65	0.881
2) Of the quality of my specific athletic program(s)	3.83	3.81	0.948
3) Of the chance of significant playing time	3.23	3.24	0.883
4) Of communications with the head coach	2.99	3.47	0.012*
5) Of communications with assistant coaches	2.49	2.53	0.796
6) Of my communications with current student-athletes	2.66	2.50	0.365
7) Of my communications with alumni of the school	1.81	1.81	0.947
8) Of the quality of the head coach	3.76	3.78	0.964
9) Of the conference affiliation	3.04	2.70	0.060
10) Of the quality of the opponents	2.99	2.69	0.115
11) Of the recruiting materials I received (brochures, programs)	2.90	2.80	0.548
12) Of the quality of the athletics website	2.81	2.65	0.284

\*Denotes significant at the .05 level.

munications with the head coach), 5 (communications with assistant coaches), 6 (communications with current student-athletes), and 8 (the quality of the head coach) accounted for an additional 11.89% of variance for the entire survey group. The authors define these as sociological in nature because they contribute to prospects' aspirations and the associated status of positions or occupations acquired through participation, rather than as econometric (the number of Division III athletes moving to professional athletic career is small—as is the case with this sample group—but a certain percentage of participants choose to pursue management careers in athletic and sport organizations, which can be aided by intercollegiate athletic participation experience).

The athletic variables that pertain to media and institutional and programmatic communication (the athletic department website, recruiting brochures, and programs) were influential to the aggregate population. Because Division III schools garner a limited portion of general national and local media attention (as is the case with the subject of this case study), it stands to reason an important way for prospects to gauge the institutional commitment to athletic programs, and to compare this level of commitment in a tangible way to other institutions, is by comparing these communication tools. Therefore, it can be concluded a prospective student-athlete would not opt to attend one school over another based on how many times each appears on television because virtually none of them do. However, it is easy to compare one school athletics website against another and to do the same with the publications each produces.

Also of importance to the aggregate population were econometric factors such as family/friends variables 4 (friends or peers attending the school), 5 (high school teammates attending the school), 6 (the opinion of high school teammates), and 8 (other immediate family members attended the school) and each of the four physical variables (preferred distance from home, the type of community preferred, the quality of the residential dorms, the general appearance of the campus), which in combination accounted for nearly 22% of the total variance in the analysis. These data seem to indicate the relative equal importance of sociological and econometric factors in the decision-making process and verify the importance of adapting a combined research model for this study.

As noted above, research examining the college selection process for matriculants is an area that has been examined in a few studies, but, as noted by Bateman and Spruill (1996), "is an important, and largely untapped, area which can be used to influence enrollment" (p. 185). Most of the existing research focuses on the process through which students decide which college to attend, and other studies examine the influences on this process, and as noted, few of these existing studies focus on student-athletes as subjects. The intent of this research was to develop a model that can be applied by intercollegiate athletic managers to improve the yield of athletic recruits. Among the findings uncovered in this research was the realization of the important role of coaches and interest in intercollegiate athletic

participation in the admission process, even at this case study Division III institution. In terms of interest in participation, the sample population included a significant percentage of the institution's incoming first-year class, most of whom would never have elected to attend if not for the presence of the desired athletic program and the contact from coaches as part of the recruiting process. This sampled population of this case study represents a substantial source of revenue for the institution, and as such, the institution would suffer a painful budgetary shortfall if this population were to decrease.

In this vein, the authors posit a potential important contribution of this research is to provide a basis from which to tailor recruiting efforts so coaches of specific sports may be able to use a model through which they will be able to contact and encourage desired prospects to apply and matriculate. The aggregate data included in the analysis are helpful for establishing basic understandings, but the segmented data by gender and sport can be more directly applied by coaches to target their prospect group more effectively. To this end, the research sought to understand difference among certain segments of the total population, such as by gender, sport, and amount of non-loan financial aid. In terms of gender segmentation, female athletes were more influenced than males by physical variables 1 (preferred distance from home), 2 (the type of community preferred), and 4 (the general appearance of the campus); academic factors 2 (the perceived quality or reputation of the school) and 3 (the size of the undergraduate population/enrollment); and athletic variable 2 (the quality of the specific athletic program[s]). Males were more influenced by family/friends variables 4 (friends or peers attending the school) and 5 (high school teammates attending the school) and athletic variables 5 (communications with assistant coaches) and 7 (communications with the alumni of the school). This also reveals the relative similarity in importance of both sociological and econometric factors in the decision making of both males and females.

The segmentation based on non-loan financial aid revealed to those student-athletes who received \$5,000 or less, family/friends variables 5 (high school teammates attending the school) and 6 (the opinion of my high school teammates) were found to be significant. For those student-athletes who received more than \$5,000 in non-loan aid, it is not surprising the financial aid factor was a significant influence. Athletic variable 4 (communications with head coach) also registered significantly as compared to the other portion of the segment. Again, both sociological and econometric factors influenced the process.

### **Limitations**

One consideration concerning this research is sample size. Although it captures an entire population of first-year student-athletes, Tabachnick and Fidell (2000) suggested sample sizes of at least 300 for factor analysis. This study is strong in its ability to capture the responses of an entire population, but it is potentially

difficult to generalize these findings to all Division III first-year student-athletes at large because it is a sample group that is unique to a specific institution. Another potential limitation of the study pertains to equity in financial aid awards. As noted above, as Division III student-athletes, respondents cannot receive financial aid based on athletic abilities. However, this does not mean all schools are able and/or willing to meet all demonstrated need based on family financial data submitted by aid applicants. Some schools may choose to include more loan-based assistance based on the school's own financial state or may choose to provide a lower aid package if the prospect is less desirable in relation to the overall admissions pool. Few schools are "need blind" in the admissions process, meaning few schools have the financial capabilities to admit any students they wish and then opt to meet all demonstrated need of prospects so they may matriculate. Finally, there is the practice of providing student-athletes with grants in excess of demonstrated need. Such awards, often called "merit" or "leadership" grants, are often awarded on a range of nonathletic criteria, such as demonstrated leadership roles such as team captain or student government office, which are often held by high school student-athletes, or high academic achievement, high test scores, or demographic diversity factors. Although such awards are not technically based on athletic ability, these "leadership" grants can be awarded in a higher percentage to student-athletes than nonathletes. Such awards indicate the complex and occasionally nefarious nature of the financial aid factor.

An additional limitation of the research relates to the time of data collection. Participants completed these surveys in some cases several months after the decision to matriculate had been made. Although this delay in some cases might have allowed for a more thoughtful perspective on the process, the delay might also have caused in inability to recall specific elements for some participants. Also, because the survey was administered during a meeting session where other forms and paperwork were required to be completed, participant ability to recall and answer completely and comprehensively may have been lessened.

## Conclusion

The data that emerged from the aggregated and segmented analyses reveal that although certain specific variables have varied levels of impact, econometric and sociological factors are influential in prospects' decision making. One possible conclusion that can be drawn is the student-athletes in this case study view athletic participation as not merely an adjunct component of their college experience but rather as a core element. As such, they are assessing closely a broad range of factors relating to athletic participation, factors that, as the research shows, relate to issues of aspirations and the associated status of positions or occupations acquired through not only attending the school but also intercollegiate athletic competition, as well as the econometric factors outlined above.

To pursue this particular line of inquiry, further study to investigate these factors should be performed. Another important next step in this research process would be to meet with coaches at the institution to discuss the findings and to craft a process by which the findings contained here could be used to improve matriculation yield. The production of such a model, tested regularly, could enable coaches to interest and attract desired prospects, thereby improving significantly team and program performance and most likely impacting positively the student-athlete experience overall.

A final factor to examine is how this study can be assessed based on the heuristic perspective of decision making, which cites decision makers are not wholly rational during the process and not all rational factors are weighed equally in the process. Based on the findings outlined above, the authors argue the aggregate case study population demonstrated a heuristic perspective. First, many of the athletic factors cited above can change rather quickly, such as program performance and coaching personnel. Therefore, prospects may be making a choice based on a factor that could be completely different in 4 years. Also, family/friend factors are also influenced by change, as many such relationships can end, differ, or transform depending on life situations.

In addition, the findings above identified several initial athletic factors that were significant in influencing prospect decision making for the aggregate population. These factors are potentially changeable and are only a few of the total 28 options posed, signifying although students were presented with a range of rational options, not all were considered and weighed equally in the process. Subgroups within the aggregate population also demonstrate variance in influencing factors, which supports the notion the process is heuristic because various factors influenced each group.

As indicated by Eisenhardt and Zbaracki (1992), studies of rationality and bounded rationality in decision making are based on the premise the rational model of choice follows the everyday assumption that human behavior has some purpose. This research has sought to shed light on the factors of a common model of rational action that have led a specific population of first-year student-athletes to their choice of institution at which to study and compete. The findings of the research indicate the population at large and segments within the population follow a model that is heuristic in nature; that is, the student-athlete decision makers have made their choice on certain factors that can be deemed rational, and others are more intuitive and emotional and given more consideration to some factors over others. Continued research on this topic with such a population should provide richer visions of how this type of population acts.

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## Management Whitepaper

# Joining the Team: A Case Study Identifying and Assessing Critical Factors Influencing NCAA Division III Student-Athlete Matriculation

Daniel D. Covell, Marilyn K. Pelosi, and Jodi Lemoi

## I. Research Problem

Purpose of paper and topic examined: This research sought to understand what factors influence how first-year student-athletes at a National Collegiate Athletic Association (NCAA) Division III institution choose the school to attend.

Importance of issue: It can be argued the recruiting of prospective student-athletes is about resource acquisition, as student-athletes are one of the basic resources necessary for the maintenance of winning programs, and recruiting is the process through which programs obtain these vital resources.

Audience/intended stakeholder group(s): College admissions personnel, college coaches and athletic administrators, academicians, and researchers who focus on intercollegiate athletics issues.

## II. Issues

This case study research sought to identify and understand what characteristics and factors most strongly influence how a specific population of student-athletes chooses which college to attend from the perspective of strategic decision making.

This research examined the college choice process for prospective student-athletes based on the heuristic perspective of bounded rationality, which posits that decision makers are rational in some but not all elements of the process. The generally accepted “bounded rationality” model claims that there are cognitive limits to rational decision making and that many decisions follow the basic phases of problem identification, development, and selection.

This research is significant because of the critical nature of attracting qualified prospects and getting them to choose one intercollegiate athletic participation opportunity over another, and it is difficult to understate the importance of attracting the most athletically proficient athletes possible to schools and programs so that their programs may experience on-field success. To meet the charge stated above, this study examined responses from first-year student-athletes at a National Collegiate Athletic Association (NCAA) Division III classification institution located in the northeastern United States so practitioners and researchers may gain an

understanding of which factors are most influential in predicting matriculation. The institution is private, is coeducational, has a full-time undergraduate population of approximately 2,500 (the majority of whom live on campus), and awards both bachelor's and master's degrees in the liberal arts, business, and engineering.

### III. Summary

The survey questionnaire was divided into two main sections. Part I asked respondents to answer basic demographic questions pertaining to gender, type of high school attended, planned sport(s) of participation, level of financial assistance received, the nature of contact received from the school's coaching staff, and whether a family member had attended the school. Part II of the survey consisted of 28 questions divided into five sections: physical, academic, family/friend, financial aid, and athletic. These questions also addressed the charge to create a combined research model that assessed both econometric factors (i.e., geographic location, academic factors, perceived economic benefit or financial rate of return of pursuing a degree, family background, social context, and academic experiences) and sociological factors (i.e., educational aspirations and the associated status of positions or occupations acquired through attendance). The authors also sought to determine whether subgroups (as determined by gender, level of non-loan financial aid, major, and sport) valued certain factors differently.

The analysis showed that for the entire survey population, factors such as conference affiliation, quality of opponents, recruiting materials, and quality of the athletic website were important in influencing the decision to matriculate.

### IV. Analysis

This research sought to provide the basis for a model for coaches to use to contact and encourage desired prospects to apply and matriculate. The aggregate data included in the analysis are helpful for establishing basic understandings, but the segmented data by gender and sport can be more directly applied by coaches to target their prospect group more effectively. To this end, the research sought to understand differences among certain segments of the total population, such as by gender, sport, and amount of non-loan financial aid.

In terms of gender segmentation, female athletes were more influenced than males by the school being the preferred distance from home, by the school being located in the type of community preferred, and by the general appearance of the campus. Males were more influenced by friends or peers attending the school and by high school teammates attending the school.

The segmentation based on non-loan financial aid revealed that student-athletes who received \$5,000 or less were significantly influenced by high school teammates attending the school and by the opinion of former high school teammates. For those student-athletes who received more than \$5,000 in non-loan aid, it is not surprising to learn the financial aid factor was a significant influence.

## V. Discussion/Implications

The intent of this research was to develop a model that intercollegiate athletic managers can use to improve the yield of athletic recruits. Among the findings uncovered in this research was the important role of coaches and interest in intercollegiate athletic participation in the admission process, even at this case study Division III institution. In terms of interest in participation, the sample population included a significant percentage of the institution's incoming first-year class, most of whom would never have elected to attend if not for the presence of the desired athletic program and the contact from coaches as part of the recruiting process. This sampled population of this case study represents a substantial source of revenue for the institution, and as such, the institution would suffer a painful budgetary shortfall if this population were to decrease.

In this vein, the authors posit this research provides a basis from which to tailor recruiting efforts so that coaches of specific sports may be able to contact and encourage desired prospects to apply and matriculate. Although the aggregate data included in the analysis are helpful for establishing basic understandings, the segmented data by gender and sport can be more directly applied by coaches to target their prospect group more effectively.