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The Influence of Selected Variables on NCAA Academic Progress Rate

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The Academic Progress Rate (APR) was created in 2004 to measure the real-time academic culture of NCAA Division I college athletic teams. During its short existence, the APR has become one of the leading academic metrics from which teams are evaluated. Given the lack of empirical data on APR, the purpose of this study was to determine if selected variables were correlated with, and were significant predictors of, single year APR scores. Ten independent variables were used to evaluate the dependent variable of APR from a sample of 652 NCAA Division I first-year student-athletes. Pearson correlations revealed APR scores were significantly related to gender, race, high school GPA, standardized tests, major, sport, coaching change, playing time, and team winning percentage. Least squares linear regression analysis demonstrated that gender, race, sport, coaching change, and winning percentage significantly predicted 38.7% of the variance observed in APR scores. These results could aid in programming efforts of first-year student-athletes while contributing to the APR body of knowledge.

Introduction

National Collegiate Athletic Association (NCAA) Division I athletics offer an elite athletic environment framed within the walls of higher education. The inimitable balance between athletics and academics has caused a level of antipathy between athletic and academic interests. This antagonism is especially true for elite football and men's basketball programs where the most successful athletic teams are often criticized for lackluster academic performance (Knight Commission, 2001; NCAA, 2009, 2011a). To counterbalance declining academic standards, as well as provide structure for initial and continuing eligibility, the NCAA has enacted a variety of academic reform measures. For example, in 1983, the NCAA adopted Proposition 48, a groundbreaking measure that established a 2.0 grade-point average (GPA), 700 SAT score, and

11 core high school courses as minimum standards for prospective student-athletes (Baumann & Henschen, 1986). Amid wide-ranging criticism, Proposition 48 was superseded in 1992 by Proposition 16 which including a *sliding scale* relationship between standardized test scores and high school GPAs, and increased the number of core requirements from 11 to 13 (Judge & Johnson, 2011; NCAA, 2010). These initiatives gave way to the current round of academic reform that spawned the Academic Progress Rate (APR).

APR Defined

Established in April of 2004, the APR was a groundbreaking metric designed to measure academic performance while being a "sufficient incentive for athletics programs to ensure the mission of educating student-athletes is not compromised, circumvented or ignored" (NCAA, n.d.a., p. 1). The rationale for the APR came from the lack of real-time academic data for individual athletic teams (Brown, 2005). The previous academic markers used by the NCAA were initial eligibility measures (e.g., Propositions 48 & 16) or graduation rates. These measures, however, were determined before students entered college, or were calculated six years after students were admitted. While enrolled at an institution, the NCAA also monitored GPA and percentage of degree completion for individual student-athletes. These semester-by-semester measures provided sufficient information to determine eligibility for an individual student-athlete, but did little to explain the academic culture of an entire team. Therefore, the APR was designed as a semester-by-semester metric to evaluate the academic culture of an entire team, which could then be compared to other teams across the country (Brown, 2005).

The APR is calculated for all "currently enrolled student-athletes receiving institutional financial aid based in any degree on athletics ability" (NCAA, 2004, p. 1). Eligibility and retention criteria are used to calculate individual student-athlete APR points which are used in the overall team APR calculation. In one semester a student-athlete can earn two points; one point for being academically eligible, and one point for returning to school the following semester. An individual student-athlete can acquire four APR points during an academic year by being eligible and returning to pursue their education for both academic semesters (Brown, 2005). Retention and eligibility were chosen because they are the two factors that best indicate graduation, which is the goal deemed most important by the NCAA (Brown, 2005).

A retention point is earned when a student-athlete "is retained by the institution, returning to school as a full-time student the next regular academic term" (NCAA, 2004, p. 2). When a student graduates they also receive a retention point. To earn an eligibility point, a student-athlete must meet minimum standards for GPA, credit hours completed, and progress towards degree. Students must earn a 1.8 GPA after year one, a 1.9 after year two, and a 2.0 in each subsequent year. Minimum credit hour requirements include 6 hours completed per semester, 18 hours between two semesters, and 24 hours for an entire academic year. Progress towards degree requirements mandate after the second year of athletic eligibility students must have earned 40% of their degree, 60% after year three, 80% after year four, and 100% after year five (Hamilton, 2005). While many institutions adhere to the NCAA minimum requirements, individual conferences and institutions may require minimums above these standards. Stringent policies that exceed the NCAA minimums could prevent an eligibility point that would have otherwise been earned by another institution who adhered to the minimum standards.

The APR is calculated by dividing the team's total points earned by the total team points possible. This number is multiplied by 1,000 to make the score easily understood (a perfect score is 1,000). Penalties accrue when scores dip below 925. The Committee on Academic Performance (CAP) designated this cutoff because it was originally thought to equal a 60% graduation rate, and it allowed for normal attrition rates. Diane Dickman, managing director of membership services for the NCAA, explained the 925 mark this way;

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

Teams that fall below the 925 mark are subject to both contemporaneous and historical penalties. Contemporaneous penalties are the most immediate penalties and occur when a team score below 925 has a student-athlete go 0/2 (ineligible and leaves school). This specific penalty means the institution cannot re-award the scholarship to another student-athlete. Therefore a 0/2 means that a scholarship is lost for a full year. This type of penalty is designed to identify immediate problems and reinforce the importance of retaining student-athletes, while moving them towards graduation (NCAA, 2004, 2010). Historical penalties are more severe and occur when a team falls below 900. These penalties began after four full years of data were collected in 2008. Crenshaw and Leger (2007) noted these penalties were designed to punish the chronic underperformers through loss of scholarships, postseason bans, and loss of NCAA membership.

APR Outcomes

Following the first year of data collection, 183 of the 326 (56%) schools had at least one program deemed substandard by the NCAA (Wieberg, 2005). Altogether 411 of the 5,720 Division I programs were flagged. Football (923), men's basketball (923) and baseball (922) were the only sports to have a national average under the 925 cutoff. Women's field hockey, lacrosse, and rowing earned the highest average scores (981 for each). A total of 1,737 teams had perfect APRs, none of which were in Division I-A football.

The next five years of data collection (2004-05 and 2008-09) had similar results as the first year. Several women's sports continued to have high marks while the same three men's sports (baseball, basketball, and football) registered the lowest average APR scores. The second year of data collection revealed that 111 out of 6,100 teams were penalized, while the third year showed 112 teams penalized. These numbers indicated less than 2% of all NCAA Division I-A teams were subject to contemporaneous penalties (NCAA, 2006). The most anticipated data set came from the fourth year. This data triggered the use of the four-year rolling average, which was used to enact more serious punishments to offenders. Single year APR scores were still used to determine contemporaneous penalties, but any loss of post-season play was to be determined by the historical penalty structure (Stewart, 2007). Similar to previous years, the four year average saw approximately 3% of all Division I-A teams fall below the 925 mark. Only 218 teams out of approximately 6,100 were penalized. Of those, 174 lost scholarships for the 2008-2009 academic year. Former NCAA president, Miles Brand, saw those numbers as encouraging. He explained the relatively positive outcome as the result of the gradual introduction of the APR over the previous four years, as well as institutions' commitment to embrace the philosophy of the APR, and make behavioral changes within their athletic departments (Sander, 2008).

Academic reports from the 2009-10 and 2010-11 academic years showed multi-year Division I APRs for all sports as 967 and 970 respectively. In the high-profile sports, football's average four-year APR was 944 and 946, while men's basketball was 940 and 945. In 2009-10, 177 teams at 107 schools received penalties, while 103 teams at 67 schools were sanctioned in 2010-11. There were 1,143 fewer student-athletes in 2010-11 year who were "0-for-2," compared to 2004-05, the first year of APR penalties (NCAA, 2011a).

Although there have been continued improvements in Division I APR scores since its inception, the APR is not without criticism and subsequent revision. Two key revisions were passed by the NCAA in 2011. First, the four-year postseason benchmark was increased from 900 to 930 to compensate for lower-than-estimated Graduate Success Rates (GSR) for comparable APR scores (Hosick, 2011; NCAA, 2011b). Second, a new penalty structure combines contemporaneous and historical penalties into a three-level penalty structure based solely on the four-year rolling average. Level one penalties limit practice time, level two penalties limit competition dates, and the third level of penalties could include coaching suspensions and scholarship reductions.

APR Research

The influence the APR has had on NCAA Division I athletics has been extensive. It would be rare to find an administrator or coach at the Division I level who does not routinely evaluate APR scores, especially if they have been close to the 900 and 925 penalty benchmarks. Similarly, athletic advising and support offices are keenly aware of the APR because they must program to improve scores while simultaneously educating coaches and athletic administrators on the importance of such a metric (Meyer, 2005). It is clear the APR has taken its own place in the lexicon of college athletics where the terms *eligibility* and *graduation rates* have perched for decades (Smith, 2011).

Despite its far-reaching and practical influence, there have been no empirical studies, and relatively little reporting, on APR outside of the annual press releases provided by the NCAA (NCAA, 2011a). This is surprising when one considers that every Division I student-athlete receiving athletic aid contributes to their team APR. Moreover, the lack of research is unanticipated in view of the potentially serious consequences tied to low APR scores, and that APR scores are made public via the APR team and coach databases maintained by the NCAA (NCAA, n.d.b, NCAA, n.d.c). The lack of empirical investigation is likely the result of two factors. First, APR has only been in existence for seven years, and the historical penalties have only been calculated for three years. Second, the research and publication process sometimes takes several years to complete.

Although APR itself has not been empirically investigated, there is plethora of research examining academic variables relative to student-athletes, especially for two of the contributing factors to APR; eligibility and retention (Astin & Osguera, 2004; Babington, 1997; Durand, 1999; Johnson, Wessel, & Pierce, 2010, in press; Kane, Leo, & Holleran, 2008; Tinto, 1993). GPA is only part of the eligibility criteria used to calculate APR, but has been one of the most scrutinized academic variables related to collegiate student-athletes. A comprehensive review of student-athlete GPA is beyond the scope of this paper, but it is important to note that GPA is regularly used to determine eligibility, financial aid, recruiting, transfer decisions, playing time decisions, and APR scores (Johnson et al., 2010). Retention, a second critical component of the APR, is equally as important as GPA. The magnitude of retention is clear when one considers that approximately 40% of college students will never earn a degree (Astin & Oseguera, 2004), and 75% of those students will likely leave within the first two years of their college careers (Tinto, 1993).

The most contemporary studies to evaluate GPA and retention of student-athletes were conducted by Johnson et al. (2010) and Johnson et al. (in press). Using a combination of demographic variables (i.e., gender, race, distance from home), academic variables (i.e., standardized test scores, high school GPA, high school rank, major) and athletic variables (i.e., sport, coaching change, playing time, winning percentage), the authors investigated 674 Division I student-athletes in 19 sports to determine which variables best predicted GPA and retention. For GPA, gender, race, standardized tests, high school GPA, high school rank, and high school size were significant predictors. These results demonstrated that traditional demographic and academic variables were the most powerful variables to consider when predicting GPA. The results also demonstrated that athletic variables (i.e., sport type, coaching change, playing time, and winning percentage) had virtually no impact on GPA. Conversely, race, distance from home, sport, and playing time were significant predictors for retention. These results suggested the variables most influential to predict retention were demographic and athletic in nature. Unlike GPA, two of the four athletic variables under investigation contributed to predicting retention (Johnson et al., in press).

The Johnson et al. (2010, in press) studies demonstrated markedly different predictors for GPA than for retention. Whereas demographic and academic variables significantly contributed to predicting GPA (i.e., gender, race, standardized tests, high school GPA, high school rank, high school size), demographic and athletic variables largely aided in predicting retention (i.e., race, distance from home, sport type, playing time). If both GPA and retention would have been predicted by the same variables, it would be logical to conclude those variables would also predict APR. This, however, was not the case. Given these results, the next logical question to ask is which variables predict APR? Therefore, the current study was designed to utilize the variables investigated by Johnson et al. (2010, in press) to determine: 1) the individual relationship between each of the selected variables and APR; 2) if any of the selected variables were significant predictors of APR.

Method

A sample of 652 NCAA Division I student-athletes in 19 varsity sports were sampled during a five-year span (2005-06 to 2009-10) to determine which selected variables aided in the prediction of single-year APR scores. The sample was taken from a large Midwestern university where the student-athletes were investigated during their first year of college. Only first-time first-year student-athletes were investigated. Student-athletes that transferred into the university were not included in the sample. Student-athletes that transferred out of the university during or after their first year, however, were included in the retention calculations. Additionally, no student-athletes turned professional after the first year of college. A total of 10 variables were selected as potential predictors of APR scores (i.e., gender, race, distance from home, high school GPA, standardized test scores, major, sport type, coaching change, playing time, and team winning percentage). The academic variables of high school rank and size (Johnson et al., 2010, in press) were not utilized in the current study due to large amount of missing data and a reliance on high school GPA and standardized test scores as the most appropriate and powerful academic variables under consideration. Each variable investigated was hypothesized to be significantly correlated with, and a significant predictor of, APR.

The comprehensive list of first-year student-athletes was obtained from the Athlete Advising Office, which serves as the primary liaison between the academic community and the athletic department. Each team list was provided to Athletic Advising by head coaches during the week before the semester began as part of pre-semester academic meetings designed to identify a current roster and determine academic services for the upcoming fall semester. Upon completion of the participant roster for each year under investigation, archival data was mined using multiple sources. The selected variables of gender, race, hometown (to determine distance from home), high school GPA, standardized test scores, and choice of major were extracted from the university's central database. The athletic variables (i.e., sport, coaching change, playing time, and winning percentage) were obtained using a combination of athletic media guides and information stored on the athletics website.

Operational Definitions

Operational Definitions for each of the 10 selected variables were paramount during the data collection process. To accurately collect and code data, the following operational definitions were adopted from Johnson et al. (2010, in press). A brief explanation of each variable is included where appropriate.

1) *Gender* = male or female.
2) *Race* = Caucasian or minority. Race was divided into two groups due to the small amount (n = 33) of minority student-athletes that were not African American and the large amount of Caucasians in the sample (n = 498). Of the 33 non-African American minority student-athletes, most were considered bi-racial (n = 22), while seven were Hispanic/Latino, and four were Asian American.
3) *Distance From Home* = short (less than 100 miles from the university), medium (101-250 miles from the university), or long (250+ miles from the university). The longer the distance, the more difficult visits to home would prove to be.
4) *High School GPA* = The grade point average earned on a 4.0 scale. High school GPA was calculated from core high school classes.
5) *Standardized Test Scores* = SAT or ACT scores. SAT scores were converted to ACT score format using a concordance table provided by American College Testing (2009). If a student-athlete had both SAT and ACT scores, ACT scores were used.
6) *Major* = declared a major or was undecided. This designation was self-reported by student-athletes upon their entrance into the university.
7) *Sport* = revenue or nonrevenue sports. Revenue sports were designated as football, and men's and women's basketball because they were the three highest revenue-producing sports at the university. The other 16 varsity sports were designated as nonrevenue sports.
8) *Coaching Change* = no coaching change, positive coaching change, or negative coaching change. Coaching changes were recorded for a change in head coach any time during the academic year. A positive coaching change was recorded if a head coach moved to a

different program or retired. A negative coaching change occurred if a coach was fired or their contract was not renewed.

9) *Playing Time* = low (played in less than one third of total contests), medium (played in one third to two thirds of total contests), high (played in more than two thirds of total contests). Although each sport has a different type of contest (e.g., games, rounds, meets, or matches), the percentage of total number of contests were used to determine playing time. The exception to this definition occurred in men's and women's basketball where the percentage of total minutes was used rather than the percentage of contests.
10) *Winning Percentage* = number of wins divided by the total number of contests during a sport season. In golf and track where multiple teams compete in competition, winning percentage was calculated as the mean percentile ranking of all competitions.

Because individual years were not a variable of consequence, the data collected across five years were collapsed into one dataset. This permitted confidentiality of individual student-athletes because no student-athlete could be identified by the year they entered school. Individual names were deleted during the collapse of the data to further ensure confidentiality. Data were analyzed using SPSS Predictive Analytics Software version 19. For descriptive purpose, analysis included frequency counts, measures of central tendency, standard deviation, and percentages. Following descriptive analysis, the selected variables were subjected to Pearson Correlation analysis to determine the potential relationships between variables. Finally, the selected predictor variables underwent least squares logistic regression analysis against the criterion variable of APR to determine which selected variables aided in predicting APR scores.

Results

For the criterion variable of APR, there were a total of 652 scores (*M* = 963.04, *SD* = 35.93). A total of 205 revenue student-athletes produced a mean APR score of 934, while a total of 447 nonrevenue student-athletes produced a mean APR score of 974. The descriptive information for the predictor variables is displayed in Table 1. Descriptors include total number of participants (*N*), the percentage of each variable related to the overall sample (%), the mean (*M*), and the standard deviation (*SD*). The descriptive results reveal relatively even distributions between the categories of gender and distance from home, but demonstrate uneven distributions for the remaining variables. For example, race includes a large Caucasian sample (76.4%) when compared to the minority sample (23.6%), while sport includes a majority of student-athletes from non-revenue sports (68.6%) compared to revenue sports (31.4%).

Table 1 - *Descriptive Information for Selected Predictor Variables*

Variable	*N*	%	*M*	*SD*
Males	347	53.2		
Females	305	46.8		
Caucasian	498	76.4		
Minority Races	154	23.6		
Distance (0-100 miles)	240	36.8		
Distance (101-250 miles)	206	31.6		
Distance (over 250 miles)	206	31.6		
Has Major	533	81.7		
No Major (undecided)	119	18.3		
Standardized Test Scores	652		21.6	3.8
High School GPA	652		3.1	.5
Sport – Revenue	205	31.4		
Sport – Non-Revenue	447	68.6		
Positive Coaching Change	47	7.2		
Negative Coaching Change	42	6.4		
No Coaching Change	563	86.4		
Low Playing Time	352	54		
Medium Playing Time	82	12.6		
High Playing Time	218	33.4		
Team Winning Percentage	652		46	.5

Note. Team Winning Percentage is presented as a % indicating all student-athletes won 48% of their total contests.

Table 2 presents the Pearson Correlation Coefficients for the selected variables. All variables except distance from home were correlated with APR scores. Eight of the nine variables were significant at the .001 alpha level. The three most powerful relationships with APR scores were sport (r = -.53), gender (r = .47), and race (r = .32). In fact, the correlation coefficient between APR scores and sport was the same strength as the relationship between high school GPA and standardized test scores ($r = .53$). This r value proved to be the strongest relationship among all selected variables.

After the examination of Pearson correlations, a least squares linear regression analysis was conducted to evaluate how well the selected variables predicted APR scores. The predictors were 10 variables hypothesized to influence APR scores, while the criterion variable was APR scores. The linear combination of selected variables was significantly related to APR scores, F (10, 641) = 40.47, $p < .01$. The sample multiple correlation coefficient was .62, indicating that approximately 38.7% of the variance of APR scores can be accounted for by the linear combination of the selected variables.

Table 2 - *Pearson Correlation Coefficients Between Selected Variables and APR*

	APR	Gender	Race	Distance	HS GPA	Stand. Tests	Major	Sport	Coach Change	Playing Time	Winning %
APR	—										
Gender	.47**	—									
Race	-.32**	-.21**	—								
Distance	-.05	.06	.15**	—							
HS GPA	.28**	.32**	-.32**	.02	—						
Stand. Tests	.24**	.15**	-.31**	-.05	.53**	—					
Major	.09*	-.08*	.07	.04	-.07	-.08*	—				
Sport	-.53**	.52**	-.43**	-.07	.4**	.36**	-.15**	—			
Coach Change	-.21**	.03	.06	.02	-.02	-.07	-.03	-.17**	—		
Playing Time	.16**	.23**	-.01	.07	.13**	.04	.04	.26**	.01	—	
Winning %	.18**	.07	-.06	-.08	.03	-.03	.01	.08*	.18**	-.11**	—

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

Table 3 outlines the results of the least squares linear regression for the selected variables. Despite nine of the ten variables being significantly correlated with APR score, only five variables significantly contributed to predicting APR scores. Those variables were gender (*B* = .29), race (*B* = -.11), sport (*B* = .24), coaching change (*B* = -.19), and winning percentage (*B* = .14). None of the three academic variables (i.e., high school GPA, standardized test scores, and major) contributed to the prediction of APR scores. However, three of the four athletic variables examined (i.e., sport, coaching change, and winning percentage) accounted for a majority (57%) of the total 38.7% observed variance in APR scores.

Table 3 - *Summary of Least Squares Regression for Selected Variables Predicting APR*

Variable	*B*	*Std. Error*	*Beta*	*t*	*sig*
Gender	21.14	2.71	.29	7.81	<.01**
Race	-9.53	3.03	-.11	-3.15	<.01**
Distance	-.83	1.39	-.02	-.6	.55
High School GPA	.16	2.59	<.01	.06	.95
Stand. Tests	.6	.36	.06	1.64	.1
Major	-1.76	2.93	-.02	-.6	.55
Sport	18.66	3.39	.24	5.51	<.01**
Coach Change	-12.3	2.2	-.19	-5.86	<.01**
Playing Time	1.76	1.31	.05	1.34	.18
Win %	10.08	2.32	.14	4.35	<.01**

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

Discussion

The first variable under investigation, gender, was significantly correlated with (r = .47, p < .01), and significantly aided in predicting APR (B = 21.14, p < .01). The correlation coefficient of .47 demonstrates a moderately strong relationship between gender and APR. Likewise, the *B* value from the least squares regression analysis indicates that if all other variables were held constant, female student-athletes would have an APR score 21.14 points higher than males. These significant relationships are consistent with the first seven years of

APR data collection which demonstrated that males have consistently lower APR scores than females (NCAA, 2006, 2011a; Stewart, 2007). In fact, the APR scores for football, men's basketball, and men's baseball have demonstrated the three lowest team scores since the beginning of APR data collection (NCAA, 2006, 2011a). These results are also consistent with the overwhelming majority of literature indicating female student-athletes outperform males in nearly all academic areas. Whether it is GPA, high school measures, standardized test scores, graduation rates, or academic motivation, females tend to have superior results (Babington, 1997; Durand, 1999; Hosick, 2009; Johnson et al., 2010; Kane et al., 2008; Mayo, 1982; Melendez, 2006).

The managerial implications for gender advocate for an increased monitoring and intervention strategy for male athletes. Because males consistently demonstrate lower APR scores than females, it can be assumed that males are in an academic culture that, on average, does not exhibit the level of academic commitment shown by females. Therefore, it is reasonable for personnel in advising, administration, and coaching to provide programming efforts designed to improve APR scores. For example, more academic intercession, increased tutor availability, and an amplified effort to retain male student-athletes could alleviate the disparity between male and female APR scores. Although many colleges and universities already engage in such behavior for their most *at-risk* student-athletes, directly targeting males is a difficult undertaking due to gender equity guidelines (Smith, 2011).

The second selected variable under investigation was race. For the purposes of this study race was divided into two categories; Caucasian and minority student-athletes. Similar to gender, race was significantly correlated with APR ($r = -.32$, $p < .01$). Also similar to gender, the least squares regression analysis revealed race was a significant predictor of APR ($B = -9.53$, $p < .01$). A B value of -9.53 denotes that Caucasian student-athletes demonstrated an APR score 9.53 points higher (out of 1,000) than a minority student-athlete if all other variables were constant. Existing literature indicates these results are consistent with most studies involving race. Specifically, Caucasian student-athletes tend to display higher GPAs, standardized test scores, high school measures, retention behaviors, and academic motivation than their minority counterparts (Babington, 1997; Institute for Diversity and Ethics in Sport, 2009; Johnson et al., 2010, in press; Kane et al., 2008; Killeya, 2001; Sellers, 1992; Shapiro, 1984; Siegel, 1994).

Poor academic performance for minority student-athletes has been linked to a variety of causes including a desire for upward mobility while minimizing academic pursuits, fewer opportunities for economic success, an over-developed athletic identity, and contemporary racism (Ashe, 1977; Kihl, Richardson, & Campisi, 2008; Melendez, 2006; Siegel, 1994). Determining the likely cause is a difficult endeavor that is beyond the bounds of the current study. The importance of the current findings, however, lies in the practical application that can be garnered from the results. In much the same fashion as males, minority student-athlete APR scores would likely benefit from increased academic programming efforts focused on enhanced tutoring, academic skill building, and enhanced advising initiatives. It would also behoove administrators, coaches, and advisors to educate themselves on the distinctive challenges faced by minority student-athletes (Siegel, 1994). Such a gesture would be of particular relevance in the sports of men's basketball and football where 71.2% and 56% of the student-athletes are designated as minorities, respectively (Brown, 2011).

The third variable investigated in the current study was distance from home. Of all the variables investigated, distance from home was the only variable that was neither correlated with ($r = -.05$), or significantly aided in predicting APR ($B = -.83$, p = .55). In other words, the distance student-athletes attended college from their home had the least amount of interaction with APR scores. This finding is somewhat surprising because distance from home was found to be a relatively powerful predictor of retention, which is half of the calculation for APR scores (Johnson et al., in press). This finding is also curious considering distance from home is a consistent reason for college choice (Briggs, 2006; Higher Education Research Institute, 2008; Martin, 1996; Rajapaksa & Dundes, 2003), and has been linked to homesickness (Fisher, 1989).

Although distance from home was found to be a significant predictor of retention (Johnson et al., in press), it was not found to be a significant predictor of GPA (Johnson et al., 2010). This dichotomy gives credence to the argument that APR is a unique metric that is not overly influenced by the retention variable, but resembled GPA, at least in terms of the distance from home variable. From a practical standpoint, the current findings suggest that coaches and administrators should not focus their efforts on location of student-athletes' homes during the recruiting process in an effort to improve APR scores. However, the distance from home variable should not be entirely ignored because it is a significant predictor of retention into the second year of college, which does factor into the APR calculation. Although distance from home may not be a significant predictor of APR, improving retention could only help APR scores while creating a more stable culture on individual athletic teams (Johnson et al., in press).

High school GPA was the fourth variable under investigation. Results indicated a significant relationship with APR ($r = .28$, $p < .01$) whereby an increase in high school GPA is related to an increase in APR score. However, the relationship was not strong enough to aid in the overall prediction of APR scores ($B = .16$, $p = .95$). The correlation found between APR and high school GPA supports much of the previous literature linking high school GPA to student-athlete college GPA (Baumann & Henschen, 1986; Johnson et al., 2010; Lang, Dunham, & Alpert, 1988; Nettles, 1984). In fact, Johnson et al. (2010) found high school GPA to have a strong relationship with college GPA ($r = .64$, $p < .01$), in addition to being the most powerful predictor of college GPA ($B = .41$, $p < .01$). These results make intuitive sense when one considers that high school GPA is likely achieved with the same (or similar) skills as college GPA, and that college GPA is one factor used in the overall APR calculation. Although the correlation between high school GPA and APR is not as strong as the relationship between high school GPA and college GPA, the relationship is significant.

The fact that high school GPA is not an APR predictor may appear surprising at first, especially considering the correlational evidence discussed above. However, when one remembers that APR is partially calculated using retention, this result is understandable. High school GPA has not been found to be a significant predictor of retention for student-athletes (Johnson et al., in press), and thus was not found to be a predictor of APR. This is further evidence that the APR is a unique metric that sometimes resembles GPA, while at other times resembles retention. Pragmatically, high school GPA has been used for decades to make decisions about admissions, recruiting, and the probability of college success. Results from this study, as well as Johnson et al. (2010), suggest high school GPA can be used for those purposes. Focusing on high school GPA for those purposes certainly could not hurt APR scores. However, if the goal is solely to predict APR scores, high school GPA is not a variable of choice.

The fifth variable investigated in this study was standardized tests. For operational purposes, standardized tests were defined as scores on the SAT or ACT. Similar to high school GPA, standardized tests have been used for decades to effectively predict college academic performance, especially when used in conjunction with high school GPA (Ayers v. Fordice, 1995; Bridgeman & Wendler, 1989; Burton & Ramist, 2001; Johnson et al., 2010; Sacks, 1997).

Based on the previous literature, as well as conventional wisdom that standardized tests are one of the primary tools of choice for admissions departments, it was hypothesized that standardized tests would predict APR.

Results for standardized tests, like those for high school GPA, revealed a significant correlation with APR ($r = .24$, $p < .01$), but an insignificant ability to predict APR ($B = .6$, $p = .1$). The significant relationship between standardized tests and APR indicate that higher standardized test scores are related to higher APR scores. This result is logical based on the assumption that such tests offer an indication of academic potential, which ultimately would influence the academic eligibility of student-athletes. However, like high school GPA, standardized test scores were not a significant predictor of APR. This result is most likely due to the retention variable used to calculate the APR. Johnson et al. (in press) confirmed that standardized test scores were not a significant predictor of retention. Furthermore, the lack of prediction capabilities for standardized test scores might also be attributed to flaws in the tests themselves. There is a body of literature suggesting such tests might be poorly designed or biased to particular groups (Babington, 1997; Baumann & Henschen, 1986; Hoffman, 1961; Worthen & Spandel, 1991; Young & Kobrin, 2001).

From a managerial perspective, the use of standardized tests, especially in conjunction with high school GPA, has been used for decades with mostly reliable outcomes (Ayers v. Fordice, 1995; Bridgeman & Wendler, 1989; Burton & Ramist, 2001; Sacks, 1997). Such use is likely to continue given the results from the current study, as well as the results from Johnson et al. (2010, in press). These studies revealed standardized tests are correlated to GPA, retention, and APR scores, while also a significant predictor of GPA. However, these studies also revealed that standardized tests are not a significant predictor of retention or APR. Therefore, using standardized test scores for recruiting, programming, and admission decisions appears to be a reasonable practice. Nevertheless, standardized test scores do not predict APR.

Major was the sixth variable investigated in the current study. Undecided students ($n = 119$) were those that did not declare a major upon entering college, while students that chose a major ($n = 533$) were considered a declared major. Similar to the previous two academic variables (i.e., high school GPA and standardized test scores), major was correlated with APR ($r = .09$, $p < .05$), but was not a significant predictor ($B = -1.76$, $p = .55$).

The logic behind investigating major as a variable of potential influence on APR is predicated by research supporting and negating its potential influence. For example, the fact that major is correlated with APR scores (i.e., higher APR scores = declared major) is supported by a variety of sources linking major with a heightened level of commitment and focus on academic pursuits (Gordon and Steele, 2003; Roese and Summerville, 2005; St. John, 2000). Theoretically, these sources suggest students who are willing to commit to a specific field of study early in their college career are the ones that will tend to produce higher academic achievement in the form of various metrics such as GPA (Johnson et al., 2010). Moreover, the impact of major choice has been found to be particularly powerful in cases where academic clustering might occur. Academic clustering is defined as more than 25% of students on a given team enrolled in one major (Fountain & Finley, 2011; Sanders & Hildenbrand, 2010; Schneider, Ross, & Fisher, 2010). If first-year student athletes declare a major because it is less rigorous than another area of study, the cluster effect could influence APR. The current study did not investigate clustering or specific major choice, but given the attention of this phenomena in recent years (Fountain & Finley, 2011) it is reasonable to acknowledge that future research linking major choice and APR should consider potential clustering effects.

Conversely, major was not a significant predictor of APR. This finding supports a body of work with conclusions opposite to the literature referenced above, and suggests that being undecided is not influential to academic achievement or college graduation (Knight, 1994; Kroc, Howard, Hull, & Woodard, 1997; Schein & Laff, 1997). In fact, Schein and Laff (1997) go as far as calling the concept of a major "bureaucratic and administrative" with structures that ultimately may reduce creative options available to students with unique academic interests. Additionally, the lack of APR prediction is not surprising when one considers that major did not predict retention (Johnson et al., in press). Furthermore, From a practical standpoint, major should be treated similarly to high school GPA and standardized tests with regard to APR. It is certainly advisable to monitor which student-athletes have declared a major, and use such information in decisions about academic advising or programming. Such a practice cannot hurt APR scores. Predicting APR scores, however, is not advanced by knowing if a student has declared a major.

The seventh variable investigated was sport type (revenue or nonrevenue). Revenue sports were football, men's basketball, and women's basketball. Nonrevenue sports were the remaining 16 varsity sports. Results indicated sport type had the strongest relationship with APR of any variable investigated ($r = -.53$, $p < .01$). Sport was also a significant predictor of APR scores ($B = 18.66$, $p < .01$). In fact, if all other variables were held constant, revenue sports would achieve an APR score 18.66 points lower (out of 1,000) than nonrevenue sports.

These results were hypothesized given the APR annual reports produced by the NCAA. In those reports, football and men's basketball are routinely cited as having the lowest APR scores moving from 923 in the first year of data collection for both sports, to 946 for football and 945 for basketball in the most recent report (NCAA, 2011a). These annual APR results are consistent with the findings from the current study which revealed a mean APR score of 934 for revenue sports ($n = 205$) and 974 for nonrevenue sports ($n = 447$). Furthermore, these findings are consistent with literature indicating revenue sports routinely demonstrate lower GPAs, graduation rates, and retention levels than nonrevenue sports (Johnson et al., 2010, in press; Kane et al., 2008; Kihl et al., 2008; Lang et al., 1988; Le Crom, Warren, Clark, Marolla, & Gerber, 2009; Mayo, 1982; NCAA Research Staff, 2009; Shapiro, 1984).

Stakeholders within collegiate sport would be well-served to focus academic support initiatives towards revenue sports. This recommendation will not be a surprise for many coaches and administrators, especially considering the sports of football and men's basketball are routinely considered the most academically at-risk teams on many college campuses, and often associated with the commercialization and professionalization frequently synonymous with big-time college athletes (Johnson et al., 2010; Meyer, 2005; Sperber, 2001). More importantly, sport could be used in combination with other variables (i.e., gender, race, etc.) to develop an academic risk portfolio based on variables identified in this study. Such a profile could serve to drive allocation of available resources.

Coaching change was the eighth variable under investigation. For the purposes of this study, coaching change was defined as positive, negative, or no change occurring during the academic year. Positive change included a promotion to a new institution following success at the current institution. Negative change was defined as being fired or demoted. Defining coaching change in this way was a deviation from the two previous studies investigating a head coaching change conducted by Johnson et al. (2010, in press) whereby a coaching change was defined as a dichotomous variable of change versus no change. The adjustment in operational definition for coaching change occurred as a result of recommendations by Johnson et al. (2010, in press) to be more specific due to the potential impact of context on such a coaching change. This recommendation also occurred after coaching change was not found to be a significant predictor of GPA or retention, which is surprising given the large body of literature documenting the impact of a coach on the well-being of student-athletes (Amorose, 2003; Gagne, Ryan, & Bargmann, 2003; Parsh, 2007).

The current study found that coaching change was both significantly correlated with (r = -.21, p < .01), and a significant predictor of (B = -12.3, p < .01) APR score. A B value of -12.3 indicates that a negative change in head coach would produce an APR score 12.3 points lower than a positive change, and 24.6 points lower than no change at all, assuming all other variables were constant. This result is somewhat surprising considering Johnson et al. (2010, in press) found coaching change was not a significant predictor of GPA or retention. The likely explanation is the change in operational definition which takes into account the context of the coaching change. This result is logical when one considers that a situation likely to cause a negative coaching change may involve an environment where the coach may be under stress to win games, or where the coach may not relate well to their team. This idea is further reinforced by the significant correlation between coaching change and winning percentage (r = .18, p < .01). Similarly, in a situation where no coaching change occurs, the team environment is likely to be more stable, thus ensuring a consistent pattern of academic expectations from the coach. These results, although significant, should be considered preliminary due to the small sample size of positive (n = 47) and negative (n = 42) coaching changes. Examining more coaching changes across a variety of institutions may yield different outcomes.

The ninth variable under investigation was playing time. Playing time was significantly correlated to APR (r = .16, p < .01). This correlation indicated that student-athletes who played in more than two-thirds of their team's contests had higher APR scores than students who played in less than two-thirds of contests. Such a relationship is logical considering the powerful impact playing time has on student-athlete identity, motivation, retention, and enjoyment (Johnson, in press; Petlichkoff, 1993a, 1993b; Weiss, McAuley, Ebbeck, & Wiese, 1990). Furthermore, this relationship was hypothesized given the discrepancy between high school and college playing time (Moe, 1994, Murphy, 1991). Most NCAA Division I athletes were the best athletes on their high school teams. They are not accustomed to sitting on the bench after successful high school careers (Murphy, 1991). This change in athletic utility may have a variety of impacts including a change on academic motivation that ultimately may influence APR, and has already been found to be related to GPA and retention (Johnson et al., 2010, in press).

Despite the significant relationship with APR, playing time was the only athletic variable that did not aid in predicting APR (B = 1.76, p = .18). It is plausible that the other variables found to be significant predictors of APR overshadowed playing time in the regression equation. This is a likely explanation for any variable found to be correlated, but not a significant predictor of APR. Another possible explanation would be that playing time has been found to be a significant predictor of retention (Johnson et al., in press), but not a significant predictor of GPA (Johnson et al., 2010). In other words, playing time predicts only one of the variables used to calculate APR scores, and thus is not powerful enough to predict APR scores themselves. Therefore, if playing time predicts retention, but retention is only half of the APR calculation, it is easy to conclude how it could be correlated, but not a significant predictor. Practically, this is valuable information for coaches and administrators because they can improve the retention component of APR calculations with a better understanding about how playing time might influence student-athletes. This suggestion is not meant to propose all players receive equal amounts of playing time in order to improve APR scores. That is unrealistic. It is, however, realistic to educate coaches on the link between playing time and APR so they can decide for themselves how to better recruit and define individual player roles.

The final variable under investigation was team winning percentage. Results indicated that team winning percentage had a significant relationship with APR ($r = .18$, $p < .01$), and significantly aided in predicting APR ($B = 10.08$, $p < .01$). Additionally, for every .001 improvement in winning percentage, APR scores increased by one point, assuming all other variables were held constant. Results for winning percentage appeared to be the most curious of any variable investigated in this study considering Johnson et al. (2010, in press) did not find any significant relationships between winning percentage, GPA, or retention. The current results, however, are not as curious when one recognizes that APR is a team score, whereas GPA and retention are individual variables. Thus, the winning percentage of a team is more likely to coincide with APR scores because the same score (or percentage) is attached to all members of the team, unlike GPA that is unique to each individual. Additionally these results are supported by literature that suggested teams with the highest winning percentage, particularly in revenue sports, have historically been found to produce relatively low graduation rates and APR scores (Hosick, 2009; Institute for Diversity and Ethics in Sport, 2008; Shapiro, 1984). Furthermore, these results make sense when one considers that team athletic success has been found to influence the number and quality of freshman admission applications, financial contributions from donors, and attendance (McCormick & Tinsley, 1987; Petersen, Johnson, & Yurko, 2010; Stinson & Howard, 2008). In short, winning matters. In this case, winning appears to matter enough to impact APR scores.

The logic behind why winning is important is basic. Winning teams generate excitement. It is fun to win. The atmosphere on a winning team, and in winning programs, is likely to be more positive and supportive for all members of the team. Such an environment is likely to transcend beyond the courts or fields into other areas of life, even academic pursuits. Pragmatically, it is worth noting for stakeholders of college athletics that student-athletes on unsuccessful teams may be more susceptible to producing lower APR scores. In these cases, extra academic programming may be given to teams that are not winning. Or, as an alternate solution, APR scores could improve if the importance of winning could somehow be deemphasized. Given the current culture of Division I athletics, where elite competition and high profile sports have created a financial arms race for salaries and facilities (Knight Commission, 2001; Smith, 2011; Sperber, 2001), deemphasizing winning is unlikely.

Conclusion

Given the lack of APR research, especially considering the impact APR has had on the culture of NCAA Division I athletics, empirical evaluation of APR was overdue. The current study begins such an evaluation by determining if selected variables were related to, and aided in predicting, APR scores for first-year student-athletes. Variables were selected based on research from Johnson et al., (2010, in press) who found markedly different sets of demographic, academic, and athletic variables were responsible for predicting GPA and retention, two of the primary components used to calculate APR.

Results revealed APR was significantly correlated to all selected variables under investigation except distance from home. This fact is important because it demonstrates APR is related to a broad set of variables which are demographic (i.e., gender and race), academic (i.e., high school GPA, standardized test scores, and major), and athletic (i.e., sport type, coaching change, playing time, and winning percentage) in nature. Furthermore, the variables that were significant predictors of APR were largely different from the variables that predicted GPA and retention (Johnson et al., 2010, in press). For APR, significant predictors included gender, race, sport type, coaching change, and winning percentage. These variables accounted for 38.7% of the variance found in APR scores. The only variable found to predict APR, as well as GPA and retention, was race. Besides race, the only predictor variable shared by APR and GPA was gender. Similarly, the only predictor variable shared by APR and retention (besides race) was sport type (Johnson et al., 2010, in press). These results support the notion that APR does not overly resemble GPA or retention, and is a unique metric in itself.

The fact that three of the five significant predictors of APR were athletic variables should be noted. This important finding demonstrates the influence that Division I athletic participation can have on academic pursuits. These findings also supports a critical discovery by Johnson et al. (in press), who found that playing time was the most powerful predictor of retention for first-year Division I student-athletes. Given the high athletic identities found in elite athletes (Melendez, 2006), these results are not necessarily surprising. Functionally, the results of this study can aid administrators, coaches, and other college athletic stakeholders in better understanding some of the variables that impact APR. By including athletic variables into a comprehensive student portfolio, that often includes only demographic and academic variables, stakeholders can make more informed decisions about programming efforts. If nothing else, these results confirm athletic variables are powerfully linked to academic outcomes.

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