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The Impact of Intercollegiate Athletics on Graduation Rates Among Major NCAA Division I Universities

Implications for College Persistence Theory and Practice

Introduction

One of the most pressing issues facing American universities is the number of students who fail to graduate. Low graduation rates cost universities scarce resources; weaken the ability to meet educational objectives; and are perceived to reflect the university's ability to meet the educational, social, and emotional needs of students. Moreover, retention and graduation rates are a major component of national ranking schemes, such as the US News Annual Ranking of US *Colleges and Universities.* Although the use of retention and graduation rates as measures of performance indicators have been criticized (Astin, 1993; Ronco, 1994), many state legislatures and boards of higher education nevertheless link freshman retention and graduation rates to university budgets as a component of performance-based funding (Carnevale, Johnson, & Edwards, 1998). In addition, Federal Law requires colleges and universities to disclose their graduation rates along with campus crime rates as part of the Student Right to Know Act (Federal Register, December 1, 1995).

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The Journal of Higher Education, Vol. 74, No. 5 (September/October 2003) Copyright © 2003 by The Ohio State University Crosscutting the concern about retention and graduation rates is the long-standing tension between the emphasis placed on academic performance and intercollegiate athletic program success. A voluminous body of research exists that examines the relationship between postsecondary graduation and intercollegiate athletics. This research, however, has almost exclusively focused on how the graduation rate of student athletes is affected by their participation in intercollegiate athletic programs (American College Testing Service, 1984; DeBrock, Hendricks, & Koenker, 1996; Pascarella, Bohr, & Terenzini, 1995). In fact, we are aware of only one study (Tucker, 1992) that specifically examines how successful intercollegiate athletic programs, in general, and national prominence in sports, specifically, affect *institutional* retention and graduation rates.

Given the interest in the relationship between retention and graduation and the vast literature addressing intercollegiate athletics and academic performance, it is surprising that the combination of the two has produced so little empirical attention. In this article, in order to begin addressing this gap in the literature, we explore the relationship between intercollegiate athletic program success and theories of student persistence by examining the impact that athletic programs have on *institutional* graduation rates.

Theoretical Perspectives on Student Persistence

Research on retention and graduate rates often focuses on the overall issue of student persistence, in other words, the degree to which an individual is repetitively and/or continuously enrolled at an educational organization in order to achieve his or her goal of eventual graduation. Research on student persistence generally adopts one of several theoretic perspectives; economic, interactional, organizational, psychological, and societal (Tinto, 1986). Thus far, the interactionist model developed by Tinto (1975, 1986), which is based on the theoretic perspective of Emile Durkheim, has generated the largest amount of empirical attention and empirical assessment (Cabrera, Castaneda, Nora, & Hengster, 1992; Munro, 1981; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1980; Terenzini, Pascarella, Theophilides, & Lorang, 1985).

Tinto's model (1975; 1986) first assumes that incoming students possess a set of individual traits (e.g. age, sex, race/ethnicity, high school achievement history, encouragement and socioeconomic status of their parents) that influence their overall commitment to the institution of higher education, as well as their specific commitment to attain a college degree. Second, the individual traits of students, combined with their commitment to higher education appear to influence their academic and social integration into a specific educational organization (e.g., community college, university). Third, Tinto's interactionist model posits that the incoming student's overall level of academic and social integration strongly influences his or her persistence to graduation, or in contrast, the choice to drop out of school altogether.

Nora and Cabrera (1993) provide a succinct definition of Academic and Social Integration, the two multi-dimensional concepts that are among the most commonly accepted, and empirically tested components of Tinto's (1986) interactional model. Academic Integration is defined as the development of a strong affiliation with the college academic environment both in the classroom and outside of class. Academic Integration might be demonstrated through learning-centered interaction with faculty and academic staff, or involvement in peer tutoring or study groups. Nora defines Social Integration as the development of a strong affiliation with a college's social milieu, both in the classroom and outside of class. Examples of Social Integration might include ongoing interaction with peer group members, informal contact with faculty or involvement in student organizations (Nora, 1993, p. 235).

It is well documented that as academic and social student integration increases, overall persistence increases as well (Pascarella & Terenzini, 1983; Tinto, 1997). Further, academic and social involvement affect each other in an interdependent manner (Pascarella, Terenzini, & Wolfle, 1986). Thus, Tinto (1997) finds that academic involvement leads to greater social involvement. However, the relationship between academic and social integration appears to be inverse. Academic integration appears to have the strongest positive influence on persistence when social integration is relatively low. Then, counter-intuitively, as social integration increases, the positive influence of academic integration appears to somewhat diminish.

Research attempting to untangle the inverse relationship between academic and social integration on persistence using individual attributes (e.g., age, sex, race/ethnicity) reveals differences in experience patterns, but the patterns are not clearly differentiated and result in only modest increases in the explained variance (Pascarella & Terenzini, 1983). The attributes of educational institutions appear to mediate the influence of student involvement on persistence as well (Braxton, Vesper, & Hossler, 1995; Williamson & Creamer, 1988). Overall, social involvement has a smaller effect, and academic involvement has a greater effect at twoyear institutions (Braxton et al., 1995). Tinto (1997) suggests that the differential influence of academic and social interaction on student involvement is the result of variation in the on-campus activity pattern of students at two-year and four-year institutions. For example, students at two-year institutions typically spend more time together in the classroom (academic interaction) and less time together outside of the classroom (social interaction) than students at four-year institutions. Tinto's speculation is consistent with research by Pascarella and Chapman (1983), who claim that the persistence of students who are commuters to (compared to residents of) educational institutions is influenced more by academic integration than social integration. They speculate that social integration may be less salient to college commuters than to students who reside on campus, although the specific mechanism that reduces the salience of social integration is, to date, unclear.

In summary, as overall academic and social student integration increases, persistence increases as well. Theoretically, student involvement inside and outside of the classroom facilitates the integration of students into the complex interdependent and overlapping academic and social spheres of educational organizations. It follows, therefore, that activities or programs that bring students together should facilitate academic and social interaction, foster a shared consensus regarding institutional goals and, thus, promote persistence. And, in fact, this is precisely the rationale used for virtually all efforts to improve rates of persistence, retention, and graduation, such as mentoring, special advising programs, and block registration. Tinto (1997) points out that academic involvement promotes social involvement, but the reverse is not necessarily true. To date, however, the nonreciprocal influence of social involvement on academic involvement is unclear. Empirically based analysis is sparse and has yielded inconsistent findings. Intercollegiate sports such as football and basketball are often viewed as catalysts for student interaction, thus facilitating social involvement and ultimately enhancing student institutional affiliation and commitment. Of course, educational organizations are not unique in this regard; communities, states, and entire nations derive identity and pride from athletics as well (For an excellent account of how high-school sports integrates a community, see Bessinger, 1991). However, theoretically, intercollegiate athletic programs, especially successful programs, should have a positive effect on the creation of social communities.¹

Research based on a wide range of universities supports Tinto's (1997) argument that student social communities are a bridge to learning communities and that strengthened social communities enhance learning communities, which in turn promote institutional goals. Indeed, one of the benefits attributed to college sports programs is their ability to bring students together and provide them with a sense of pride and identification with the institution. Seen from this perspective, it is reasonable to

hypothesize that intercollegiate athletic programs would enhance the attainment of institutional goals (acquiring knowledge, making good grades, and graduating), since university goals are embedded within the larger community structure of the university. The issue here is that sports built a sense of community among students and, perhaps to a lesser extent, faculty. Since the notion of student community is central to many theories of student performance, we hypothesize that intercollegiate sports facilitate and sustain the development of student communities. Students of "sociology of sport" note the positive functions of community involvement in sport in terms of identity, inspiration, integration, and ritual reassurance (Coakley, 1990; Eitzen and Sage, 1986; Stone, 1981). To the extent that it is meaningful to speak of a student community or a learning community, there is no reason to deny these functions for college sports.

Although we recognize the intuitive appeal of this position, we note the possibility that social involvement might compete with learning objectives, reduce the importance of the learning community, and attenuate academic performance, including graduation. Indeed, Pascarella and Chapman (1983) find that high levels of social integration have little or no impact on academic integration. Increased social integration, under certain circumstances, does not appear to strengthen the commitment to institutional norms of academic success or progress. For example, Thomas (2000, p. 609) suggests that although "moderate and supportive" social ties between students may enhance persistence, "too much connectedness can actually be a bad thing in terms of academic performance." It is not unreasonable to expect that highly integrated social communities may compete with learning communities, particularly if the nature of the social interaction is in conflict with the goals of the learning community. An obvious example would be a social community that emphasizes drinking or drug use. In this situation students are likely to have a reduced commitment to the goals of the learning community and are less likely to do as well as they would under more favorable conditions. We emphasize that we are not concerned with the argument about the relative emphasis that colleges place on athletics versus academics. Rather, our research question is narrowly focused on the relationship between organizational success in intercollegiate athletics and overall institutional graduation rates for all undergraduates.

Data and Method

Academic and student-based data for this article come from the 1996–1999 editions of US News Best Colleges in America and the US

Department of Education's Integrated Postsecondary Educational Data System (IPEDS). In a few cases institutional data were obtained directly from the individual institutions when the items were not available from public data sources. Additional data about athletic programs are drawn from a variety of websites, including CBS Sports and Information Please. Our analysis is based on 97 of the 112 universities that compete in *both* NCAA Division IA basketball and football. Although 320 schools field Division I basketball teams, 208 do not field teams in both basketball and football and are excluded from analysis. We also exclude the Big West Conference and the Major Independents, with the exception of Notre Dame, because these universities are academically distinct due to their smaller size, limited graduate programs, and regional student composition. In addition, US military academies are also excluded.

For our analysis we select variables that, from previous studies of institutional graduation rates, are regarded as characteristics of universities that are the strongest predictors of graduation rates. Two of these variables, the percentage of admissions that are in the top 10%of the high-school class and the mean for the 25th percentile composite ACT score, reflect student ability. Numerous studies (Blanc, DeBuhr, & Martin, 1983; Caldas & Bankston, 1997; Gilmore, 1990; McGrath & Braunstein, 1997; Mortenson, 1997; Smith, 1992) have demonstrated a strong positive association between student ability, as reflected by selective admission standards, and graduation rates. The percentage of students living on campus and first-time freshmen as a percentage of total enrollment are included, since these variables reflect the potential for the development of strong social and learning communities (Christie & Dinham, 1991; McGrath & Braunstein, 1997). The remaining independent variables, the total enrollment of the university and the percentage of courses taught by teaching assistants, are measures of the complexity and diversity of the campus. We are unable to find studies showing the relationship between teaching assistants and graduation rates. Gilmore (1990, p. 97), however, reports a positive association between the use of part-time instructors and graduation rates. Descriptions of the variables, means, standard deviations, and bivariate correlations for the variables used in the analysis are shown in Tables 1 and 2. In order to examine the impact of sports programs, we create three measures of athletic prowess for football, basketball, and a weighted composite index of success in all intercollegiate sports programs for 1990-1999.² Our dependent variable is the average six-year graduation rate for 1997 through 1999.

Variables and Descriptive Sta	tistics		
Variable	Definition	Mean	S
Graduation Rate	Average six year graduation rate for 1996–1998	59.13	16.29
Courses Taught by TAs	Percent of classes taught by teaching assistants for 1996–1998	7.86	8.55
University Size	Average total Enrollment (000s) for 1996–1998	24.15	11.15
Living on Campus	Percent of undergraduates living on campus 1996–1998	32.43	19.62
First-Time Undergraduates	First-time freshmen as a percent of total enrolment for 1996–1998	17.75	4.80
Composite 25 th Percentile ACT	Average Composite ACT for the 25 th percentile for 1996–1998	21.50	2.78
Students in Top 10% of High School Class	Percent of entering freshmen that graduated in the top 10% of their high school class for 1996–1998	39.24	21.31
Basketball Success*	Inverse of final rank for season *0.888+ number of NCAA tournament appearances *0.937 + number of NCAA regional	0.00	1.00
Football Success*	Inverse of final rank for season *0.901+ number of wins *0.880+ number of bowl appearances *0.932	0.00	1.00
All Sports Success*	0.696 *number of championships in all sports + 0.750 *Basketball Index + 0.918 *Football Index	0.00	1.00

TABLE 1 Variables and Descriptive Statistics

*Normalized with a mean of 0 and unit variance.

Findings

We examine the combined effects of the independent variables on graduation rates via OLS regression. The general form of the model we use is to estimate the graduation rate (\hat{y}) from a vector of predictors of the form $\hat{y} = a+B_1X_1+B_2X_2+...+B_KX_K$. Separate equations are used to estimate effects of basketball, football, and a weighted sport index. Model I in Table 3 shows the baseline equation containing the six independent variables and is fixed for all sports. Model II adds the effect of athletic prowess.

Model I shows that all variables are statistically significant, with the composite ACT score and percentage of students living on campus having a relatively strong positive impact on graduation rates.³ The positive association between the 25th percentile ACT score and graduation is consistent with many previous studies (Caldas & Bankstron, 1997; Smith, 1992; McGrath & Braunstein, 1997). The percentage of students

TABLE 2										
Correlations Among Varia	bles									
Correlations*	Graduation Rate	Top 10 %	ACT 25 th	% On Campus	% First-Time Freshmen	Size	Courses Taught by TAs	Basketball Index	Football Index	All Sports Index
Graduation Rate	1.000	0.561	0.835	0.788	0.520	0.015	0.190	0.078	0.165	0.189
Top 10 %		1.000	0.587	0.458	0.168	-0.139	-0.049	0.065	0.101	0.167
ACT 25 th			1.000	0.736	0.355	0.035	0.158	0.203	0.116	0.222
% On Campus				1.000	0.581	-0.301	-0.007	0.073	-0.033	0.012
% First-Time Freshmen					1.000	-0.290	0.046	0.198	-0.049	-0.130
Size						1.000	0.215	0.122	0.275	0.315
Courses Taught by TAs							1.000	0.237	0.351	0.298
Basketball Index								1.000	-0.036	0.124
Football Index									1.000	0.773
All Sports Index										1.000

*Correlations > \pm 0.169 are significant α = 0.05

Regression Coefficients for 1996 -1998 Graduation	Rates							
Sport	W	odel I	Mc	del II	Mo	del III	Mod	lel IV
	р	р	p	р	þ	р	þ	р
Basketball								
Percent in Top 10 % High School	0.128	0.016	0.129	0.002	0.120	0.004	0.124	0.003
25 th Percentile Composite ACT	2.113	0.004	2.453	0.000	2.502	0.000	2.446	0.000
Percent of Students Living on Campus	0.328	0.000	0.300	0.000	0.316	0.000	0.321	0.000
Percent First Time Freshmen	0.614	0.002	0.729	0.000	0.675	0.000	0.670	0.000
Total Enrollment (in 000s)	0.258	0.001	0.307	0.000	0.272	0.000	0.283	0.008
Percent of Courses Taught by TAs	0.186	0.041	0.211	0.015	0.226	0.008	0.232	0.007
Basketball Index 1990–98			-2.663	0.001	-7.204	0.000	-5.397	0.001
Basketball by Size Interaction					0.192	0.016		
Middle 1/3 of Enrollment by Basketball Index							0.123	0.055
Highest 1/3 of Enrollment by Basketball Index ^a							0.132	0.020
Constant	-20.546	0.016	-30.382	0.000	-30.474	0.000	-30.627	0.000
R ²	0.	809 ^b	0.8	330 ^b	0.8	340 ^b	0.8	37 ^b
Football								
Percent in Top 10 % High School	0.128	0.004	0.111	0.015	0.112	0.014	0.114	0.013
25 th Percentile Composite ACT	2.113	0.000	2.111	0.000	2.015	0.000	1.957	0.000
Percent of Students Living on Campus	0.328	0.000	0.337	0.000	0.341	0.000	0.345	0.000
Percent First Time Freshmen	0.614	0.002	0.603	0.002	0.616	0.002	0.609	0.002
Total Enrollment (in 000s)	0.258	0.001	0.230	0.004	0.223	0.006	0.230	0.005
Percent of Courses Taught by TAs	0.186	0.041	0.132	0.170	0.144	0.135	0.143	0.138
Football Index 1990–98			1.324	0.117	-0.785	0.676	-0.685	0.684
Football by Size Interaction					0.080	0.212		
Middle 1/3 of Enrollment by Football Index							0.091	0.329
Highest 1/3 of Enrollment by Football Index ^a							0.078	0.141
Constant	-20.546	0.016	-18.824	0.027	-17.320	0.042	-16.347	0.059
R^2	0.	809 ^b	0.8	312 ^b	0.8	814 ^b	0.8	13 ^b

TABLE 3

Sport	Moc	lel I	Mo	del II	Mod	lel III	Moc	del IV
	q	d	q	d	q	d	q	d
All Sports								
Percent in Top 10 % High School	0.128	0.004	0.145	0.001	0.123	0.004	0.125	0.004
25 th Percentile Composite ACT	2.113	0.000	2.313	0.000	2.231	0.000	2.161	0.000
Percent of Students Living on Campus	0.328	0.000	0.309	0.000	0.328	0.000	0.329	0.000
Percent First Time Freshmen	0.614	0.002	0.649	0.001	0.649	0.000	0.640	0.001
Total Enrollment (in 000s)	0.258	0.001	0.295	0.000	0.251	0.001	0.259	0.001
Percent of Courses Taught by TAs	0.186	0.041	0.237	0.011	0.264	0.003	0.262	0.004
All Sports Index 1990–98			-1.804	0.038	-7.045	0.000	-4.935	0.001
All Sports by Size Interaction					0.233	0.002		
Middle 1/3 of Enrollment by All Sports Index ^a							0.171	0.053
Highest 1/3 of Enrollment by All Sports Index							0.165	0.002
Constant	-20.546	0.016	-26.809	0.003	-24.736	0.004	-23.153	0.008
R ²	0.8	4 60	0.8	16 ^b	0.8	34 b	0.8	332 b

8,00 n; ur nbbei 8,00 n dn 05,73 18,400 are the reference. ^bR-Square is adjusted for degrees of freedom.

TABLE 3 (Continued)

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living on campus also has a strong positive effect on graduation rates. We interpret this relationship to indicate that the percentage living on campus reflects the greater likelihood that students have common associations and develop a stronger sense of community. In addition, the percentage living on campus is associated with the diversity of the student body, and a homogenous student population is more conducive for interaction and the development of social communities. Although the standardized coefficient for the percentage of all students who are freshmen is weaker ($\beta = 0.335$ vs. 0.180 for the percentage living on campus), it is also positive for the reasons that support the relationship between the percentage living on campus and retention. Again, this finding replicates other studies.

The relationship between size and graduation in Table 3 is positive. A positive association between graduation rates and size was found by Tucker (1992), who analyzed the relationship between graduation rates and success in athletics in 64 major universities. Kamens (1971) reports a positive association between university size and retention, which he explains as a consequence of the superior status-allocating ability of large schools. Huffman & Schneiderman (1997), however, report a negative association between size and graduation rates. The Huffman and Schneiderman analysis is based on 800 four-year postsecondary institutions using NCES IPEDS data and finds a -0.102 correlation between enrollment and the average six-year graduation (p. 17). When Model I in Table 3 is estimated for 280 Division II universities (analysis not shown), the beta for the effect of the number of full-time students on graduation rates is 0.155 for Division II vs. 0.169 for Division I. The bivariate correlation between size and graduation rates for 376 Division I and II schools combined is 0.345. A plausible explanation for the difference between Huffman and Schneiderman and our study is that the former includes a large number of very small colleges and the association between size and graduation is negative among the smallest schools.⁴

The percentage of courses that are taught by teaching assistants, although weak, has a positive effect on graduation rates. This is surprising, because teaching assistants lack classroom experience and are generally rated lower than are full-time instructors or professors (Marsh & Duncan, 1992; Wachtel, 1998). To the extent that the classroom experience is regarded to be of lower quality when taught by TAs, we had expected a negative effect on graduation, since poor performance in the classroom should inhibit the development of learning communities. Although we are unaware of studies that have examined this specific relationship at the macro or institutional level, Gilmore (1990) reports a positive relationship between the percentage of part-time instructors and graduation rates, which he attributes to increased social interaction. It is possible that the positive relationship between TAs and graduation is spurious, because institutions with a high percentage of TAs are major research universities, which as a group have higher admission standards and admission selectivity, both of which have a strong positive effect on graduation rates. Although we have conducted an extensive review of relevant studies, we are unable to locate a specific analysis of the relationship between the use of TAs as teachers and institutional characteristics.

The hypothesis implied by the theoretical model of student integration that successful college sports programs would have *higher graduation rates is not supported in our analysis*. Model II in Table 3 shows that universities with a strong basketball program and a strong weighted sports program have *lower* graduation rates. Specifically, a gain of one standard deviation on our measure of basketball and the weighted index for all sports reduces the graduation rate by 2.66 and 1.80%, respectively.⁵ Although the association between graduation and success in football is in the hypothesized direction, it fails to reach statistical significance. Tucker (1992) used similar measures of sport success but different independent variables and found a significant negative effect of football success on graduation rates, but a weak (not significant) positive impact for basketball.

Alternative measures (not shown) of basketball and the sport index were used with similar results. The standardized slope for the effect of basketball success measured as a binary (ranked versus not ranked for the ten-year period) is -0.152 (p = 0.003), and when the sum of years that the program was ranked from 1990–1999 is used, the coefficient is -0.123 (p = 0.012). Dummy variables based on teams that were in the lower and upper one-half of the distribution of sum for ranked teams and referenced against unranked teams have coefficients of -0.123 and -0.142. Both are statistically significant with probabilities of 0.02 and 0.006. Dummy variables reflecting programs ranked in the lower and upper one half of the index for the weighted sports index are -0.022 (p = 0.713) and -0.120 (p = 0.074).

Size of the institution is an important explanatory variable. At large diverse universities, successful basketball programs, (or any sport program) should serve to bring diverse students together into social communities and foster identification with the institution and its goals. When the institution is smaller and more homogenous (with strong identification), sport success could act as a distraction. If this assumption is true, then we expect that institution size will explain the relationship between sport success and graduation rates. Specifically, smaller institutions with strong sports programs, particularly basketball programs, will experience relatively more disruption, and graduation rates will be attenuated. 6

Formal organizational theory holds that increased size gives rise to increased specialization and differentiation of responsibility, which weakens formal coordination and control (Blau, 1970; Scott, 1975; Meyer, 1972). Baldrige, Curtis, Ecker and Riley (1973, 1977) find that large universities are more likely to be divided into a large number of specialized, autonomous units and departments, and that academic and professional autonomy and authority increase with the size of the university. Hiller and Bogart (1973) report a positive association between faculty alienation and size. Thus, large universities are not only more diverse, but also afford faculty and students greater autonomy, thereby weakening the formal mechanisms of institutional control and producing a looser coupling of students and faculty to academic and institutional goals. Clark and Trow (1966) argue that large, diverse schools are more likely to be characterized by cosmopolitan, professional identification. "In pulling the teachers away from the students, the faculty's professional interests promote the rise and persistence of an autonomous student culture which is then filled in by student interests" (1966, p. 41). Morgan and Alwin (1980) find a strong negative relationship between school size and rates of participation in the formal behavior settings of the school.

In order to explore the effect of size and sport success on graduation further, we include an interaction term between the enrollment of the university and sports success. If our thinking is valid, then we expect that the effect of sports success will differ for institutions of different sizes. It is likely that total enrollment reflects the heterogeneity of the campus and not just the number of students. Larger campuses have a greater diversity of programs, courses, course experiences, living arrangements, and type of students. Model III in Table 3 contains an interaction term between total enrollment and sport success. The interaction is significant and positive for Basketball Success and All Sport Success and indicates that increased size reduces the negative impact of the two measures of sports success on graduation. The football success, while negative, is not significant. The remaining independent variables remain similar to Models I and II.

Because of the risk of collinearity, Model IV uses dummy variables based on the interaction between enrollment and sport success by dividing the distribution of enrollment into three levels; universities in the lowest 1/3 of the distribution are used as reference.⁷ As can be seen, the effect of basketball success increases from -2.67 without the interaction term to -5.40 when it is included. The two interaction terms, however,

are positive and significant. Moreover, the coefficient for the largest universities is 0.132 and is smaller for institutions in the middle 1/3 of the distribution. These coefficients represent the change in slope of basketball success due to the interaction. For example, the effect of successful basketball programs among the largest universities is -5.27 (-5.40+0.132). For schools in the middle 1/3 of the distribution, the net effect is -5.28, and for the smallest (the reference category), it is -5.40. Thus, it appears that the size by sports interaction is not linear but obtains primarily among schools in the lowest size category.

A similar relationship is obtained when the weighted sports index is examined. The effect of sports on graduation drops from -4.94 for the smallest institutions to -4.77 for schools in the middle of the distribution, and is -4.78 for those in the largest. Inclusion of the enrollment by sport success interaction term for football fails to reach significance. The interaction between enrollment and basketball success indicates that the effect of successful sports programs is larger among smaller schools. We feel that enrollment is a proxy for the heterogeneity and diversity of the institution. Large universities not only have a large number of students, but have also extensive graduate and professional programs. Moreover, the physical size of the campus is larger and more complex. Sports on large, diverse campuses may well provide a source of identification with the institution and promote involvement and identification with the institution. However, on a smaller, more homogeneous campus, involvement in a successful sports program is more intense, conflicts with academic goals, and may lead to goal displacement.

These results raise two important questions. First, why is graduation affected negatively by basketball and total sport success, and second, why does success in basketball and football programs have different relationships with graduation rates? The final answer to these questions will depend on replicating these results with different data. However, we can examine this issue further by exploring some of the implications of the theory of student integration. Central to the theory of student integration is the concept of involvement in social and learning communities. Student involvement in social communities may conflict with involvement in learning communities. As noted earlier, if the student's social community is based on interests and activities that do not promote learning, then we would expect a reduction in academic success (grades, retention, graduation). We ask the question of the extent that social activities compete with learning objectives. We are not speaking here as much about the obvious effects, such as not spending time on studies, but on a more general issue of reduced commitment to goals of the institution.

There are several important differences in the way that football and basketball seasons affect students. First, football is less frequent than basketball. While a typical basketball season consists of over two-dozen games (more if tournaments are included), there are about one half as many football games. Second, although data are not available, we argue that football is of greater significance for alumni than for students; college football is an elaborate ritual, filling a weekend with extensive alumni activities (Deegan & Stein, 1989). Third, while attendance at football games, especially at Division I games is much larger than is true of basketball, we suspect that students make up a substantially larger proportion of fans at most basketball games than is true for football. It is also interesting to note that in Tucker's (1992) study, football had a significant negative effect on graduation, but basketball was not significant. Tucker used graduation and sport data from 1989, when basketball was much less popular than it is today. Attendance at Division I-A football games increased from roughly 32,000 in 1978 to 42,000 between 1982 and 1989. Since then, there has been a gradual decline; in 1993, attendance at college football games nationwide dropped below 35 million for the first time in 35 years. Between 1989 and 1994, gross receipts for the 18 postseason college football bowls increased by 33%, while basketball tournament receipts increased 120% (Wieberg, 1994).

Our results suggest that, contrary to our expectations, successful sports programs may actually have a negative impact on graduation rates. In addition, the implications of our analysis may be potentially important for theories of student integration and, more broadly, organizational theory. We explore the nature of this relationship and suggest some avenues for future research.

Discussion

We begin our speculation about the negative relationship between successful intercollegiate sports programs and graduation rates by noting that social integration is neither a necessary, nor sufficient condition for academic integration. Increased social integration, under certain circumstances, does not appear to strengthen the commitment to institutional norms of academic success or progress (Thomas, 2000). Similarly, our findings suggest that successful intercollegiate sports may not provide a mechanism for academic integration and may, under certain conditions, actually weaken it. The link between social and academic communities has been assumed, at least tacitly, to be complementary increased social integration is assumed a priori to strengthen academic integration and promote desirable student outcomes. This assumption is logical, since social communities are nested within the student's overall academic community, and thus, social ties integrated with the academic ties should, by implication, be in harmony with existent academic goals. In addition, a diverse body of research (Astin, 1994; Pascarella & Terenzini, 1980) appears to support this assumption. In order to resolve this possible conflict between our results and the existing literature, we begin by pointing out that social involvement, if carried too far, can result in suboptimal outcomes. Soccer hooliganism based on ethnicity or ultra-nationalism is an extreme manifestation of this in sports (Buford, 1992; Giulianotti, Bonney, & Hepworth, 1994; Hughson, 2000).

Thus, although our findings appear to run counter to previous studies of persistence, we argue that they actually clarify rather than contradict them. Overall, many of the factors that inhibit social integration may also weaken academic integration and attenuate persistence (such as commuting, maintaining friendships with peers not attending college, off-campus employment). In addition, activities that are not part of the student's academic environment, such as commuting or off-campus employment, may also weaken academic and/or social integration and thus compete with learning objectives as well as a student's overall commitment to graduation.

On the other hand, campus-based activities, as catalysts for social integration, are expected to enhance academic integration. But this might not always be the case. Clark and Trow (1966), Kuh (1995), and Moffatt (1989) document that a significant amount of the discretionary time available to students is directed towards the achievement of social integration (i.e., the pursuit of "fun") often at the expense of the pursuit of academic integration (i.e., the pursuit of "learning"). Furthermore, Astin (1994, p. 398) claims that "the single most important source of influence" in the lives of college students is their peers. Likewise Thomas (2000) empirically documents that overlapping and multiplex social ties serve both as channels for communication as well as powerful mechanisms for socialization. It follows that such ties could, and most likely would be utilized by students to persuade their peers to participate in recreational group activities directly related to the emergent success of their schools intercollegiate athletic team (pep rallies, or viewing athletic competition in a group setting), even when such participation might conflict with demands tied to overall academic success (preparing for an exam, or writing a paper).

Ironically, our results suggest that social involvement in intercollegiate sports, a process that broadly and indirectly is expected to facilitate graduation, may work in combination with other institutional characteristics to inhibit it. In order to better understand this counter-intuitive aggregate-level outcome, we advocate examining the negative relationship between graduation rates and success in intercollegiate sports in a way that calls attention to subtle organizational dynamics that might affect the potentially interrelated nature of academic and social integration.

We begin by pointing out that colleges and universities are educational organizations. Organizations are goal-directed, boundary-maintaining, activity systems that are created in order to accomplish goals that cannot be accomplished by an individual's effort alone (Aldrich, 1999). Organizational activity systems are composed of bounded sets of interdependent role behaviors, or in other words, sets of routines and bundles of activities (Nelson & Winter, 1982). Such routines and activities are "the forms, rules, procedures, conventions, strategies, and technologies around which organizations are constructed and through which they operate" (Levitt & March, 1988, p. 320).

Organizations are goal-directed systems within which individual members work, overall, toward collective goals, although individual participants might personally feel indifferent to, alienated from, or in conflict with one or more of the organization's collective goals (Aldrich, 1999). Thus, an assistant professor on the faculty of a research university might direct his or her focus on the research and scholarly publishing tasks that are necessary to achieve tenure and might feel indifferent to the playing schedule or ongoing performance of the organization's athletic teams.

Organizational goals are often accomplished only through an appreciation of, and delicate balancing of, the competing collective interests of the individuals and groups that compose the organization. Hypothetically, a graduate student teaching assistant, contrary to a departmental policy, might adjust a course's curriculum or scheduled examination dates as students shift their attention and increase their social interaction when one of the school's athletic teams is invited to a bowl game or becomes one of the NCAA basketball's "sweet sixteen" or "final four." In order to achieve this precarious balancing of special interests, organizational members often engage in a variety of adaptive behaviors that range from the minimizing of self-interest to complete rejection of organizational goals, as well as disregarding the conflicting goals of other member groups within the organization. Thus, individually or as a group, graduate assistants, the organization's faculty and administrative staff, and the undergraduate student population of a college or university may all react differently to the emergent, changing schedule of a successful intercollegiate team. Locked into a demanding and rigid schedule necessary for the achievement of tenure, a faculty member might conduct a scheduled examination with little awareness of, or deference

to an increase in student social interaction that is a diffuse outcome of the performance of a winning football or basketball team, despite thinly veiled administrative pleas to the contrary. Whereas sympathetic, or pragmatic faculty or teaching assistants might adjust their examination dates or course requirements in order to demonstrate "school spirit" or organizational solidarity.

Given the nature of formal organizations, it is not surprising that one of the most pervasive concepts used in organizational research is the distinction between formal and informal activities. Formal activities are directed at the attainment of specific institutional goals, while activities that take place within the organization but lack a rational means-end relationship with the formal goals constitute informal activities. Numerous studies document the way in which conflicts between formal and informal activities often produce negative outcomes in organizations. What is formal or informal, however, depends on the organizational context. In the present context, activities that are directed at improving persistence, such as freshman orientation, special advising, and transition programs would be considered formal in the context of academic goals. The same programs would be regarded as informal from the standpoint of providing recreation. From the standpoint of academic goals, intercollegiate sports programs are intended to provide students and alumni with entertainment or any number of other things and constitute informal activities. Seen from this perspective, heightened interest in sports competes with the formal academic goals and limits attainment. If this view is adopted, then intercollegiate sport success is simply another external barrier to graduation, like commuting or having a job.

While we feel that our findings are important for theories of student persistence, we also believe they have implications for persistence programs. We suspect that many colleges and universities commit substantial sums of money to athletic programs because it will improve persistence and graduation rates. The implications of either the student integration model or the formal organization perspective are clear. It is unreasonable to expect that changing activities intended to meet one set of objectives will provide an effective way to achieve other goals.

Future Analysis

Several issues in our study need to be addressed in future studies. First, we imply that basketball has a stronger negative effect on graduation because it is more important and, therefore, more disruptive of academic integration than football. We do not know how students experience intercollegiate athletics in general or how student definitions of different athletic events vary by campus characteristics. Moreover, we doubt that direct measures of sport intensity exist. However, there are several alternatives that may be fruitful. One approach is to examine the impact of football versus basketball during the era when basketball was not as popular. This would consist or repeating Tucker's 1992 study including the size by sport success interactions. Another approach is to capture the excitement generated by other sports. If the causal mechanism is the intensity and excitement generated by sports, then identification of particular sports on specific campuses should produce similar results. For example, ice hockey is an exciting sport on some campuses, and if our hypothesis is true, we expect that colleges with strong ice hockey programs will have attenuated graduation rates. A third approach would be a longitudinal analysis of change in both sports success and graduation rates by institutions stratified by size.

Another issue needing attention is our interpretation of the interaction between enrollment and sport success. We speculate that enrollment is a proxy for homogeneity and that smaller, homogeneous campuses are more likely to experience academic disruption when successful sports programs are present. Clearly, this hypothesis needs to be tested through the development of alternative indicators of campus heterogeneity.

Notes

¹Although Moffatt's ethnographic study of Rutgers discounts the importance of athletics to students on that campus, his fieldwork was conducted over twenty years ago and is limited to one campus. Indeed, Moffatt (1991, p. 45) states, "In the absence of similar ethnographic studies done elsewhere, there is no way of knowing for certain how typical material from a single institution is likely to be."

²We used principal components factor analysis to derive the following indices. Basketball Index: (Inverse of final rank for season $\cdot 0.888$) + (number of NCAA tournament appearances $\cdot 0.937$) + (number of regional championship appearances $\cdot 0.944$). Football Index: (Inverse of final rank for season $\cdot 0.901$) + (number of wins $\cdot 0.880$) + (number of bowl appearances $\cdot 0.932$). The Weighted Sports Index: (0.696 \cdot number of championships in all sports) + (0.750 \cdot Basketball Index) + (0.918 \cdot Football Index). All indices are normalized with a zero mean and unit variance.

³It is important to note that the relationships among variables in Table 3 are for aggregate or institutional characteristics. The strong positive effect for the composite ACT means that institutions that are more selective have higher graduation rates. This relationship should not be confused with the relationship between an individual's ACT score and the probability of graduation. Although a strong association between ACT scores and graduation is expected in aggregate data, research typically finds a weak or no relationship when individual probabilities of graduation are examined. For a discussion of this issue, see Robinson, 1950.

⁴Support for this comes from the fact that there is a small but significant nonlinear component ($r^2 = 0.005$, p = 0.001) among the 376 colleges in the combined Division I and II data.

⁵For readers who are surprised that the bivariate correlation between the graduation rate and the Basketball Index in Table 2 is 0.078, but in Model II of Table 3 the slope is

&0.121 after controls are introduced, we give the following explanation. Two independent variables are primarily responsible for this reversal: the Composite 25th Percentile ACT and first-time freshmen as a percentage of the total enrollment. In order to illustrate this, we present the partial correlations between the Graduation Rate, the Basketball Index, and the two control variables. We label the Graduation Rate and the Basketball Index as variables 1 and 2 and the ACT 25th Percentile Composite and Percentage Full-Time Freshmen as variables 3 and 4. Equation (1), the partial correlation between variables 1 and 2 controlling for variable 3, is significant and negative (the variable[s] right of the dot represents the controlled variable). Equations (2) and (3) are the partial correlations between 1 and 4 and 2 and 4 controlling for variable 3. The final equation (4) is the second-order partial between variables 1 and 2 controlling for variables 1 and 2 controlling for variables 3 and 4 is &0.2611. See Blalock (1970, pp. 455–462) for an explanation of this approach.

$$r_{12.3} = \frac{r_{12} - (r_{13})(r_{23})}{\sqrt{1 - r_{13}^2}\sqrt{1 - r_{23}^2}} = \frac{.078 - (.835)(.203)}{\sqrt{1 - .835^2}\sqrt{1 - .203^2}} = -.1699$$
(1)

$$r_{14.3} = \frac{r_{14} - (r_{13})(r_{43})}{\sqrt{1 - r_{13}^2}\sqrt{1 - r_{43}^2}} = \frac{.520 - (.835)(.355)}{\sqrt{1 - .835^2}\sqrt{1 - .355^2}} = .4347$$
(2)

$$r_{24.3} = \frac{r_{23} - (r_{24})(r43)}{\sqrt{1 - r^2_{23}}\sqrt{1 - r^2_{43}}} = \frac{.203 - (.198)(.355)}{\sqrt{1 - .198^2}\sqrt{1 - .355^2}} = .1445$$
(3)

$$r_{12.34} = \frac{r_{12.3} - (r_{14.3})(r_{24.3})}{\sqrt{1 - r_{14.3}^2}\sqrt{1 - r_{24.3}^2}} = \frac{-.1699 - (.4347)(.1444)}{\sqrt{1 - .4347^2}\sqrt{1 - .1444^2}} = -.2611$$
(4)

⁶We tested the hypothesis that students who are less likely to graduate self-select into universities with strong sports programs with Multinomial Logit and Tobit Regression models. The Basketball Index was the dependent in both models and is left truncated with 14 schools having values of zero. In the multinomial logit model, Basketball Success was divided into four categories: no national rankings versus colleges in the lower, middle, and upper on-third of the distribution. None of the six independents used in Model I of Table 3 reached statistical significance, and more importantly, there were no consistent relationships between the independents and Basketball Success. In Tobit Regression, the 25th Percentile ACT had a significant *positive* effect on Basketball Success. Because the 25th percentile ACT and graduation rates have a strong positive association, it is not possible for this relationship to attenuate graduation rates among schools with freshmen with high ACT scores in the models we use.

⁷The addition of the interaction terms between the three Sports Indices and Size produce variance inflation factors (VIF) between 8.2 and 8.8 for the three measures of Sport Success. These values approach the conventional threshold of 10, where collinearity is considered a problem. The largest VIFs for Model IV are in the range of 4.7 to 4.8.

References

Aldrich, H. E. (1999). Organizations evolving. Thousand Oaks, CA: Sage.

American College Testing Program and Educational Testing Service. (1984). *Athletics and academics in the freshman year: A study of the academic effects of freshman year participation in varsity athletics.* Washington, DC: American Association of Collegiate Registrars and Admissions Officers.

- Astin, A. W. (1993, September 22). College retention rates are often misleading. Chronicle of Higher Education, p. A48.
- Astin, A. W. (1994). What matters in college? Four critical years revisited. San Francisco: Jossey Bass.
- Baldridge, J. V., Curtis D., Ecker, G., & Riley, G. (1973). The impact of institutional size and complexity on faculty autonomy. *Journal of Higher Education*, 44, 532–547.
- Baldridge, J. V., Curtis D., Ecker, G., & Riley, G. (1977). Diversity in higher education: Professional autonomy. *Journal of Higher Education*, 48, 367–388.
- Bessinger, H. G. (1991). *Friday night lights: A town, a team, and a dream.* New York, NY: Harper Perennial.
- Blanc, R. A., DeBuhr, L. E., & Martin, D. C. (1983). Breaking the attrition cycle: Three effects of supplemental instruction on undergraduate performance and attrition. *Journal of Higher Education*, 54, 80–90.
- Blalock, H. M. (1970). *Social statistics: Revised second edition*. New York: McGraw-Hill.
- Blau, P. M. (1970). A formal theory of differentiation in organizations. American Sociological Review, 35, 201–218.
- Braxton, J. M., Vesper, N., & Hossler, D. (1995). Expectations for college and student persistence. *Research in Higher Education*, *36*, 595–612.
- Buford, B. (1992). Amongst the thugs. London: Norton.
- Cabrera, A. F., Castaneda, M. B., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *Journal of Higher Education*, 63, 143–164.
- Caldas, S. J., & Bankston III, C. (1997). Effect of school population socioeconomic status on individual achievement. *Journal of Educational Research*, *91*, 269–277.
- Carnevale, A. P., Johnson, N. C., & Edwards, A. R. (1998, April 10). Performance based appropriations: Fad or wave of the future? *Chronicle of Higher Education*, p. A48.
- Christie, N. G., & Dinham, S. M. (1991). Institutional and external influences on social integration in the freshman year. *Journal of Higher Education*, *62*, 412–436.
- Clark, B. R., & Trow, M. (1966). The organizational context. In T. M. Newcomb & Everett. K. Wilson (Eds.), *College peer groups: Problems and prospects for research* (pp. 17–70). Chicago: Aldine.
- Coakley, J. J. (1990). Sport in society: Issues and controversies (4th ed.). St. Louis: Times/Mirror/Mosby.
- DeBrock, L., Hendricks, W., & Koenker, R. (1996). The economics of persistence: Graduation rates of athletes as labor market choice. *Journal of Human Resources*, *31*, 513–539.
- Deegan, M. J., & Stein, M. (1989). The big red dream machine: Nebraska football. In M. J. Deegan (Ed.), American ritual dramas: Social rules and cultural meanings (pp. 77–88). Westport, CT: Greenwood Press.
- Eitzen, D. S., & Sage, G. H. (1986). *The sociology of North American sport* (3rd ed). Dubuque: W. C. Brown.
- Federal Register 34 CFR Part 668. (1995, December 1). 60, 61775-61788.
- Gilmore, J. L. (1990). *Price and quality in higher education*. Eric Clearinghouse. (ED 326 146)
- Giulianotti, R., Bonney, N. & Hepworth, M. (1994). Football, violence and social identity. London: Routledge.

- Hiller, D. V., & Bogart, D. H. (1973). University size-complexity: Academic profession and faculty alienation. *Sociological Focus*, 6, 59–73.
- Huffman, J. P., Jr., & Schneiderman, S. (1997). Size matters: The effect of institutional size on graduation rates. Paper presented at the 37th annual Association for Institutional Research Forum, Orlando, FL.
- Hughson, J. (2000). The boys are back in town: Soccer support and the social reproduction of masculinity. *Journal of Sport and Social Issues*, 24, 8–23.
- Kamens, D. H. (1971). The college 'charter' and college size: Effects of occupational choice and college attrition. *Sociology of Education*, *44*, 270–296.
- Kuh, G. D. (1995). The other curriculum: Out-of-class experiences associated with student learning and personal development. *Journal of Higher Education*, 66, 123–155.
- Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology*, 14, 319–340. Palo Alto, CA: Annual Reviews, Inc.
- Marsh, H. W., & Duncan, M. J. (1992). Students' evaluation of university teaching: A multidimensional perspective. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 143–233). New York: Agathon.
- McGrath, M., & Braunstein, A. (1997). The prediction of freshmen attrition: An examination of the importance of certain demographic, academic, financial and social factors. *College Student Journal*, 31, 396–408.
- Meyer, M. W. (1972). Size and the structure of organizations: A causal analysis. *American Sociological Review*, *37*, 434–440.
- Moffatt, M. (1989). *Coming of age in New Jersey: College and American culture*. New Brunswick: Rutgers University Press.
- Moffatt, M. (1991). Undergraduate culture and higher education. *Journal of Higher Education*, 62, 44–60.
- Morgan, D. L., & Alwin, D. F. (1980). When less is more: School size and student social participation. Social Psychology Quarterly, 43, 241–252.
- Mortenson, T. G. (Ed.). (1997). Five-year institutional graduation rates by degree level, control and academic selectivity: Postsecondary education opportunity. *The Morten*son Research Seminar on Public Policy Analysis of Opportunity for Postsecondary Education, 63, 159–166.
- Munro, B. (1981). Dropouts from higher education: Path analysis of a national sample. *American Educational Research Journal*, *18*, 133–141.
- Nelson, R. R., & Winter, S. (1982). An evolutionary theory of economic change. Cambridge, MA: Belknap.
- Nora, A. (1993). Two-year colleges and minority students' educational aspirations: Help or hindrance? In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research* (vol. 9, 212–247). New York: Agathon.
- Nora, A., & Cabrera, A. F. (1993). The construct validity of institutional commitment: A confirmatory factor analysis. *Research in Higher Education*, *34*, 243–251.
- Pascarella, E. T., Bohr, L., Nora, A., & Terenzini, P. T. (1995). Intercollegiate athletic participation and freshman-year cognitive outcomes. *Journal of Higher Education*, 66, 369–387.
- Pascarella, E. T., & Chapman, D. W. (1983). A multi-institutional, path analytic validation of Tinto's model of college withdrawal. *American Educational Research Journal*, 20, 87–112.

- Pascarella, E. T., & Terenzini, P. T. (1980). Predicting persistence and voluntary dropout decisions from a theoretical model. *Journal of Higher Education*, 51, 60–75.
- Pascarella, E. T., & Terenzini, P. T. (1983). Predicting voluntary freshman-year persistence/withdrawal behavior in a residential university: A path analytic validation of Tinto's model. *Journal of Educational Psychology*, 75, 215–226.
- Pascarella, E. T., Terenzini, P. T., & Wolfle, L. M. (1986). Orientation to college and freshman-year persistence/withdrawal decisions. *Journal of Higher Education*, 57, 155–175.
- Robinson, W. S. (1950). Ecological correlations and the behavior of individuals. *American Sociological Review, 15*, 351–357.
- Ronco, S. L. (1994). Meandering ways: Studying student stopout with survival analysis. Paper presented at the annual Forum of the Association for Institutional Research, New Orleans, LA.
- Scott, W. R. (1975). Organizational structure. Annual Review of Sociology, 1, 1-20.
- Smith, T. Y. (1992). *The big eight/big ten/SUG longitudinal retention survey: A report on findings and implications*. AIR 1992 Forum paper, Atlanta, GA.
- Stone, G. P. (1981). Sport as a community representation. In G. R. F. Luschen & G. H. Sage (Eds.), *Handbook of the Social Science of Sport* (pp. 214–245). Champaign: Stipes.
- Terenzini, P. T., Pascarella, E. T., Theophilides, C., & Lorang, W. G. (1985). A replication of a path analytic validation of Tinto's theory of college student attrition. *Review of Higher Education*, *8*, 319–340.
- Thomas, S. L. (2000). Ties that bind: A social network approach to understanding student integration and persistence. *Journal of Higher Education*, *71*, 591–615.
- Tinto, V. A. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Education Research*, *45*, 89–125.
- Tinto, V. (1986). Theories of student departure revisited. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (vol. 2, pp. 359–384). New York: Agathon.
- Tinto, V. (1997). Classrooms as communities: Exploring the educational characteristics of student persistence. *Journal of Higher Education*, *68*, 599–623.
- Tucker, I. B. (1992). The impact of big time athletics on graduation rates. *Atlantic Economics Journal*, 20, 65–72.
- Wachtel, H. K. (1998). Student evaluation of college teaching effectiveness: A brief review. *Assessment and Evaluation in Higher Education*, 23, 191–211.
- Wieberg, S. (1994, August 23). Flop go the ratings. USA Today, p. C8.
- Williamson, D. R., & Creamer, D. G. (1988). Student attrition in 2- and 4-year colleges: Application of a theoretical model. *Journal of College Student Development*, 26, 210–217.