

A LINGERING QUESTION OF PRIORITIES:
ATHLETIC BUDGETS AND ACADEMIC PERFORMANCE REVISITED

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Athletic Budgets and Academic Performance Revisited

American schools are busy places. They do much more than provide the basics of a K-12 education for their students. They are a source of civic pride, a major agent of political socialization, and the location for an almost unlimited number of extra-curricular activities. Chief among these extra-curricular activities, for many schools, is the athletic program. A person might be excused if, upon visiting a school, he or she concluded that the primary objective of the school system was to field an athletic team (Coleman 1961). Clearly, the American public educational system is an example of an organization that pursues multiple and often divergent goals (See Tyack 1985). How schools integrate academics and athletics, therefore, can tell a great deal about how organizations deal with multiple goals (Simon 1947; Rainey 1997; Meier, Wrinkle and Polinard 1999).

Extra-curricular activities have a long and storied justification in education. Some have even argued that battles have been won on athletic playing fields where character and teamwork are taught. More narrowly, extra-curricular activities within the school system are perceived to have a positive academic impact on students. A considerable body of research indicates that student participation in such extra-curricular activities as athletics minimizes delinquency (Landers and Landers 1978), mitigates dropouts (McNeal 1995) and has a positive effect on student achievement (Otto and Alwin 1977, Rehberg and Schafer 1968, Spreitzer and Pugh 1973). This positive impact has long been a justification for the expenditure of a great deal of time and public money by school districts, students, and communities. In fact, the emphasis in many schools resembles a mania over certain sports (Bissinger 1991).

Even if such participation has a positive impact for the participating students, however, the impact of athletics on academic performance of the entire school remains an open question. Students not on athletic teams may eschew studies for pep rallies and games. Nonathletes may resent attention paid to athletics and become alienated or worse (e.g., Littleton Colorado). If devotion to athletics competes with a school's traditional academic mission, then athletic

programs might have a negative impact on the academic skills of the school as a whole.

The question, theoretically, is how schools deal with the potential goal conflict. If athletics competes with traditional education missions of the schools, how do these organizations balance athletics and academics? What, if any, are the academic implications of attention to athletics?

Organizations that simultaneously pursue divergent goals are likely to be ineffective and may fail to attain either goal (Downs 1967; Rainey 1997). Because schools are open systems responsive to environmental demands (Thompson 1967), multiple demands can often cause an organization to over-stretch its resources. The existence of multiple goals (athletics/academics) suggests the possibility of goal conflict within the organization and raises the possibility of tradeoffs--focusing on one goal while ignoring or downgrading others.

Goal conflict can endanger achievement of traditional organizational goals in two ways. First, the pursuit of conflicting goals can force an organization to divert resources from traditional uses, in this case from academic programs to athletic programs. Second, the inclusion of multiple organizational goals can inculcate conflicting values. Establishing organizational values is a primary purpose of organizational leadership (Barnard 1938). Organization leaders influence the values of organizational participants by shaping (institutionalizing) norms, structures, and processes within the organization (Selznick 1957; March and Olsen 1989). Institutionalizing athletics may signal students that athletics are as important as or more important than academic achievement. This symbolic devaluation of academics among students may make the education mission of the school more difficult to attain.

This research addresses whether athletics and academics are divergent goals and what effect divergence has on an organization. Do expenditures on athletic budgets within a school district have an impact, either positive or negative, on over-all academic performance of that district?

Data and Methods

Our data come from Texas school districts covering the years 1997-2000. Texas is an

excellent environment to study the tradeoffs between athletics and educational attainment. Texas is well known as a state that is fanatical about athletics in general and football in particular (Bissinger 1991; Gent 1973; Jenkins 1972). Many school districts scheme and plot ways to keep from adding additional high schools and thus "diluting the talent" among multiple football teams. High school students are sometimes "red shirted;"¹ and spring, and now unofficial summer, football practices are virtually universal. *Friday Night Lights* describes the Texas football hysteria well. To cite a well-known phrase, in some Texas school districts it is important to have a school that the football team can be proud of.

Our analysis includes all districts with a minimum of 1,000 students. Data for 1997 through 2000 exist for athletic budgets. The number of cases will vary because not all schools report the full array of performance indicators used, but even this restriction leaves approximately 1924 cases for analysis.

Dependent Variables

Athletic programs could affect several dimensions of school performance. The first, and most obvious, dependent variable is student attendance. Attendance is an indirect performance measure simply because students who are not in class cannot learn. Our measure is the mean percentage of students who attend class on any given day.

The second performance indicator taps basic skills. Similar to many other states, Texas uses annual standardized tests as a means of measuring achievement. Currently, Texas requires students in several grades to take the Texas Assessment of Academic Skills [TAAS]. The percentage of students who pass these tests in each school district is our measure of basic skills attainment.

In addition to basic skills and attendance, we include a third group of indicators to measure upper-level academic performance. We include average scores for the district on the SAT and ACT exams. Students who are considering going on to college take one or both of these examinations. As such, these scores, unlike the TAAS, should reflect the upper end of student achievement in the district. We also use the percent of students who take the two exams

as an indicator of students with college aspirations. As the final indicator of quality education, we include the percentage of students who score above 1000 on the SAT or its equivalent on the ACT.

Independent Variables

The traditional method of examining research questions of this sort is with an education production function (Burtless 1996; Lockwood and McLean 1997). We follow this tradition and construct a regression that includes measures of environmental constraints, resources applied to the process, and organization policies designed to improve student performance.

As our basic research question involves the impact of athletics upon performance, we use the per student athletic budget of the districts as our primary independent variable. This variable (mean \$140.12, standard deviation 344.87) is highly skewed by some districts that spend a great deal on athletics, so it is subjected to a log transformation. Our first hypothesis is that the relationship between athletic expenditures and student performance is positive (Otto and Alwin 1977, Rehberg and Schafer 1968, Spreitzer and Pugh 1973). This hypothesis assumes that the individual level positive effect translates into a district-wide effect. The alternative hypothesis, based on the idea of goal conflict, is that the relationship will be negative.

Our other independent variables are a host of control variables designed to ensure that the relationship, if any, between athletic budgets and student performance is not spurious. Chief among these are the percentage of black and Latino students in the school. Minority students do less well than non-minority students on measures of academic performance (Jencks and Phillips 1998; Meier and Stewart 1991). Controlling for the percentage of minority students in the school district adjusts for this fact.

Poverty must also be included as a control variable. As many commentators have noted, poverty is a serious constraint on students' ability to learn. It not only means students lack access to learning tools in the home (e.g., computers), but it often correlates with other major problems that affect learning (e.g., unstable families, Necochea and Cune 1996; Fuller, et. al. 1996). Our measure of poverty is the percentage of students from low-income families, measured as

eligibility for free or reduced price school lunches. We expect relationships to performance will be negative.

Controlling for total per student expenditures will ensure that any relationship between athletic budgets and academic performance is not an artifact of an ample district budget. The conventional wisdom, expressed by Hanushek (1996), contends that the relationship between money and student outcomes is not consistently positive. This finding has been challenged recently by several studies (Hedges and Greenwald 1996; Lockwood and McLean 1997; Murray 1995; and Evans, Murray, and Schwab 1997).

Our precise expenditure variables are state aid and instructional funds per pupil. State aid is meant to compensate for an inadequate local tax base. Instructional funds are used to tap the focus on academics, rather than spending for buildings or other uses. We expect both relationships to be positive.

Successful schools produce successful students and controlling for this learning environment is important. We do so by using a number of measures: class size, gifted class enrollments, attendance (when it is not a dependent variable), and three teacher variables--salary, percent of teachers with advanced degrees and average experience of teachers.

Class size, the number of students per teacher in the district, should be positively related to student performance (see Hedges and Greenwald 1996; Hanushek 1996, 54) as should gifted class enrollments (percent of students in) and attendance. We expect positive correlations for the average teacher salary (Hanushek and Pace 1995), experienced teachers (average number of years teaching) and for the percentage of teachers with advanced degrees.

Findings

The results for class attendance are found in Table 1.² Because our concern is the relationship between athletic budgets and student performance rather than estimating a full-blown education production function, we will not discuss independent variables other than athletic expenditures.³ They are included only as controls to make sure that any relationship between athletic expenditures and performance is not spurious. Athletic expenditures are

positively correlated with student attendance, and the relationship does meet traditional levels of statistical significance.

[Table 1 about here]

In addition to affecting class attendance, athletics can influence student performance on basic skills exams. Students, for example, must pass classes to participate in athletics. Table 2 reveals that the relationship between athletic expenditures and student performance on the TAAS is not statistically significant. This result is not surprising as a prior study only found a small negative relationship (See TEEP Report 8, 1999). While this null finding is surprising, the TAAS measures basic skills and is the performance indicator least likely to be affected by a focus on athletics. After all, students who fail the TAAS are not likely to be eligible to participate in athletic activities.

[Table 2 About Here]

Table 3 examines the relationships between college entrance exam scores and athletic budgets. In both cases a strong negative relationship exists between athletic budgets and student performance on SAT and ACT exams. All other things being equal, athletic budgets can have a maximum impact of 32 points on the SAT or .9 points on the ACT. These are substantively large impacts. Table 4 extends this analysis to the percent of students taking these tests (and thus aspiring to attend college) and the percentage of students meeting the SAT 1000+ criterion. Again in both cases, school districts with larger athletic budgets also have student bodies that are less likely to take college admissions tests and less likely to score highly on these tests. The maximum impact is a 15 percentage point reduction in taking the test and a 8 percentage point reduction in exceeding the 1000+ standard. The percentage of students taking the test is important since test scores often drop as an increased number of students take the exam. Schools with large athletic budgets not only have fewer students taking college entrance exams, but those students who take the exams score substantially lower on them. All four relationships in tables 3 and 4 are consistent with the argument that athletics is negatively linked to student performance rather than positively linked.

[Tables 3 and 4 About here]

Conclusions

The existing literature on the impact of athletics on student performance has concentrated on individual level analyses. This level of analysis has found a positive relationship between athletics and student performance. When the analysis is moved to the district level, however, a different finding results. The results of the analysis above clearly indicate that over-all student performance is reduced by expenditures on athletics. This finding has been consistent through every performance measure tested--TAAS, SAT, ACT, aspirations (percent taking the test) and quality on SAT/ACT exams. We found no evidence of a relationship between athletic budgets and student attendance.

These findings in combination with the individual level findings suggest that athletics while positive for the individuals who participate may have negative consequences for those who do not. Only such negative externalities would generate negative relationships at the district level if the relationship at the individual level remained positive.

In short, a concentration of school districts on athletics appears to undermine an essential goal of the organization. Coleman (1961) suggested that the impressionistic view of American schools was that athletics were primary and academics secondary. These results corroborate his impression. Where school districts spend more on athletics, academic performance is lower.

Our findings here cover only a single state and a state with a fanatical devotion to high school athletics. Without additional research in other educational environments, however, we cannot be sure that these results will be corroborated. Even limited, the findings are supported by basic organization theory and, thus, suggest additional research on the impact of athletic expenditures on the overall academic performance of a school district is merited.

TABLE 1: The Impact of Athletics on Student Attendance:

Dependent Variable = Average Daily Attendance

<u>Variable</u>	<u>Coefficient</u>	<u>T-score</u>
Athletic Expenditures (logged)	.0651	4.53
<u>Control Variables</u>		
Percent Black	-.0019	1.71
Percent Latino	.0064	7.17
Low Income	-.0242	19.23
Gifted	.0082	2.50
Teacher Salary K	.000007	.75
Class size	-.1173	9.24
Percent Teachers with Advanced Degrees	-.0001	.09
Teacher Experience	.0174	2.15
State Aid	.0038	5.79
Instructional Funds (k)	-.00002	.36

R-Square = .38
Adjusted R-Square = .38
F= 84.78
Standard error .40
N 1923

Iterative reweighted least squares estimates using Andrews Sine.

**TABLE 2: The Impact of Athletics on Student Performance:
Basic Skills**

Dependent Variable = TAAS Scores

<u>Variable</u>	<u>Coefficient</u>	<u>T-score</u>
Athletic Expenditures (logged)	.0962	.91
<u>Control Variables</u>		
Percent Black	-.1473	16.80
Percent Latino	-.0510	7.56
Low Income	-.1581	16.00
Gifted	.1722	6.38
Attendance	2.7171	21.41
Teacher Salary K	.0001	1.91
Class size	.0615	.62
Percent Teachers with Advanced Degrees	.0004	.04
Teacher Experience	.4864	8.08
State Aid	-.0250	4.92
Instructional Funds (k)	.0008	1.85
R-Square	= .78	
Adjusted R-Square	= .78	
F=	449.81	
Standard error	3.04	
N	1922	

Iterative reweighted least squares estimates using Andrews Sine.

**TABLE 3: The Impact of Athletics on Student Performance:
College Board Scores**

Dependent Variable =

Variable	ACT Scores		SAT Scores	
	Slope	t	Slope	t
Athletic Expenditures (logged)	-.0904	4.06	-3.3112	3.14
<u>Control Variables</u>				
Percent Black	-.0124	6.68	-.0796	.91
Percent Latino	-.0072	5.02	.2873	4.18
Low Income	-.0450	21.57	-1.8799	18.48
Gifted	.0174	3.16	2.6540	10.68
Attendance	.0256	1.02	3.8479	3.15
Teacher Salary K	-.000007	.45	-.0011	1.47
Class size	-.0736	3.62	-4.8763	4.96
Percent Teachers with Advanced Degrees	.0015	.62	.9848	8.60
Teacher Experience	.0744	5.89	2.3412	3.83
State Aid	-.0101	9.30	-.5596	10.08
Instructional Funds (k)	-.00002	.19	-.0124	3.00
R-Square	=	.74		.62
Adjusted R-Square	=	.74		.62
F	=	354.41		196.16
Standard error		.64		29.57
N		1894		1826

Iterative reweighted least squares estimates using Andrews Sine.

**TABLE 4: The Impact of Athletics on Student Aspirations:
Going to College and Above Criteria**

<u>Variable</u>	<u>Dependent Variable =</u>			
	<u>Taking the Test</u>		<u>Above Criteria</u>	
	<u>Slope</u>	<u>t</u>	<u>Slope</u>	<u>t</u>
Athletic Expenditures (logged)	-1.5279	5.99	-.8212	5.21
<u>Control Variables</u>				
Percent Black	.0923	4.84	.0235	1.86
Percent Latino	.1536	9.92	.0584	5.85
Low Income	-.4271	18.87	-.3765	26.00
Gifted	.5132	8.89	.3541	9.69
Attendance	3.6312	13.23	.5141	2.95
Teacher Salary K	-.0003	1.64	-.0002	2.00
Class size	-.3431	1.57	-.3354	2.40
Percent Teachers with Advanced Degrees	.0557	2.21	.1468	8.82
Teacher Experience	.6327	4.64	.2391	2.70
State Aid	.0034	.30	-.0882	11.68
Instructional Funds (k)	.0050	5.42	-.0002	.34
R-Square	=	.49		.73
Adjusted R-Square	=	.48		.72
F	=	120.44		335.40
Standard error		6.90		4.39
N		1904		1921

Iterative reweighted least squares estimates using Andrews Sine.

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¹ Red shirting is the practice of having a student repeat a year in school so that is he able to mature for another year and thus have a physical advantage in high school football. Because high school rules prohibit such activities, a student is usually red shirted by repeating eight grade.

² An examination of the residuals from ordinary least squares indicated that the errors were heteroscedastic, or nonconstant. As a result, OLS estimates are not robust (Berry and Feldman 1985,77). To overcome these problems and provide estimates that are more robust, we apply iterative weighted least squares (Krasner 1988, Rubin 1983). Specifically, we used the sine estimates approach of David Andrews (1974, 523), which generates coefficients that are "resistant to gross deviations of a small number of points and relatively efficient over a broad range of distributions." When the data meet the error assumptions of ordinary least squares, this technique produces estimates identical to the ordinary least squares estimates.

³The independent variables are highly collinear; as a result some may not be significant and others might be incorrectly signed. Since our concern is having sufficient controls rather than precise estimates of each coefficient, this should not be a problem.