


College-Going Benefits of High School Sports Participation: Race and Gender Differences Over Three Decades

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Abstract

The long touted athlete advantage in college enrollment has been tempered by assertions that this advantage is actually due to characteristics that precede participation. Moreover, it remains unclear whether the benefits of sports extend into contemporary times and apply equally to female and racial minority athletes. This study uses three nationally representative longitudinal data sets of students who were 10th graders in 1980, 1990, and 2002. We find that high school sports participation was positively associated with college enrollment, even with the utilization of propensity score modeling, for White boys and girls, Black boys, and Latino boys and girls during the 1980s, 1990s, and 2000s. The most important gender and race differences include Black female athletes' college-going disadvantage in the 1980s and 1990s, and girls' persistently lower rates of high school sports participation than boys'.

Keywords

high school sports, college enrollment, race, gender

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Previous studies have found that high school athletes from the 1970s, 1980s, and 1990s were more likely to go to college than their nonathlete peers. High school sports participation has the potential to build academic, social, and psychosocial skills (Broh, 2002; Fredricks & Eccles, 2006; Spady, 1970; Tracy & Erkut, 2002), and participation may signal that the college applicant is well-rounded, fit, and successful at competition (Shulman & Bowen, 2001). However, it is also possible that this college-going advantage is actually a reflection of preexisting traits, resources, or opportunities of athletes relative to nonathletes rather than the influence of participation itself (Fredricks & Eccles, 2006; Videon, 2002). Given the growth of college enrollment and of high school athletics in recent decades (Buchmann & DiPrete, 2006; The National Federation of State High School Associations, 2011), it remains unclear whether this advantage persisted among high school athletes participating during the 2000s or whether the types of students who participated in high school sports has changed over time.

In this study, we investigate the college-going benefits of high school sports participation during the 1980s, 1990s, and 2000s, and use propensity score techniques to account for the characteristics that may select student athletes into both sports and college. We use data from three large nationally representative data sets: High School and Beyond (HS&B), the National Education Longitudinal Study of 1988 (NELS), and the Education Longitudinal Study of 2002 (ELS). Moreover, we consider whether the benefits of high school sports participation accrue uniformly to female and racial minority athletes and examine differences in the precedent characteristics held in common across diverse athletes.

College-Going Benefits of High School Sports Participation

Existing research on student athletes provides insight into why or how high school sports participation matters for college enrollment. First, high school athletes may experience a college-going advantage as a result of athlete recruitment (Shulman & Bowen, 2001). A second explanation for high school athletes' college-going advantage involves the construction and presentation of self for the admissions process. Athletic pursuits can be cultural symbols of a "well-rounded" person, someone with values, skills, and experiences that will be of benefit in college and beyond (Shulman & Bowen, 2001). A third explanation for the positive association between high school sports and college-going is that sports participation itself produces real academic, social, and psychosocial benefits. Since the 1970s, researchers have extolled high school athletes' higher grades, test scores, and educational

expectations (Eccles & Barber, 1999; Landers & Landers, 1978). High school athletes benefit socially through exposure to more motivated peers, increased status among peers, and more adult interaction (DeMeulenaere, 2010; Spady, 1970). High school athletic participation also fosters psychosocial benefits such as lower levels of depression, a greater sense of self-efficacy, and higher self-esteem (Denham, 2009; Guest, 2008; Spreitzer, 1994). Thus, the higher levels of college-going among athletes may be attributable to athlete recruitment, advantage in the admissions process, and improved academic, social, and psychosocial characteristics.

Findings from previous research on the association between high school sports participation and college matriculation are mixed, particularly in terms of whether female and racial minority athletes experience benefits that are similar to those of White boys. Data from the 1970s showed that the college enrollment rates of White and Black young men were equally improved by high school athletic participation (Braddock, 1981), and boys of both races experienced slightly more benefit than girls (Hanks, 1979). Data from the 1980s showed that high school sports benefited boys of all races (Eide & Ronan, 2001; Snyder & Spreitzer, 1990) but that Black boys and Black girls benefited less than White boys (Melnick & Sabo, 1995/2002; Sabo, Melnick, & Vanfossen, 1993). Data from the 1990s, however, showed no race or gender variation in the college-going benefits of high school sports participation (Marsh & Kleitman, 2003). These previous studies suggest that White boys may experience more benefits from sports than others. We use research on gender and race differences in the intermediary benefits of high school sports participation to understand potential gender and race differences in the college enrollment benefits of participation.

Athlete recruitment varies by race and gender, as far fewer female than male college athletes report having been recruited (Eitzen, 2009), and the increasingly stringent academic standards for athlete recruits may most severely impact the college-going of racial minority athletes (Stevens, 2007). Previous studies do find that sports participation improves girls' social psychological and academic outcomes (Crosnoe, 2002; Hanson & Kraus, 1998; Pearson, Crissey, & Riegle-Crumb, 2009) and suggest that girls even benefit more than boys because sports provide them with a unique opportunity to develop behaviors or characteristics traditionally deemed unfeminine (e.g., strength, competitiveness; Pearson et al., 2009). Others find that sports benefit the school experiences of male athletes more than female athletes (Eder, Evans, & Parker, 1995), possibly because the lesser value placed on female athletics detracts from the benefits of sports (Messner, 1988). The academic benefits of sports participation have generally been found to be stronger for

Whites than minorities (Melnick, Sabo, & Vanfossen, 1992; Sabo et al., 1993). Though findings have been mixed, taken together, they suggest that the association between high school sports participation and college-going differs by gender and by race in ways that may have changed over time.

The association between high school sports participation and attending college has possibly shifted between the 1970s and 2000s. Access to 4-year colleges has become more competitive with the supply of postsecondary education options not keeping pace with the demand. Women and racial minorities are increasingly more likely to attend college (Buchmann & DiPrete, 2006). With shifting cultural attitudes and gender norms, and the enactment of *Title IX* legislation in 1972, which prohibited gender discrimination in educational programs such as athletics, participation rates and the meaning of sports participation may have particularly changed over the last three decades for girls (Miller, Sabo, Farrell, Barnes, & Melnick, 1998). Given such changes, it is important to understand whether high school athletics still acts as an educational, as well as a recreational, resource for diverse youth.

Who Participates in Sports?

An additional possibility is that the association between high school sports participation and college enrollment may be a function of the characteristics that motivated or enabled this group of students to participate in athletics, rather than a result of the sports experience itself. For example, more socially advantaged students and those from private schools, small schools, or schools in rural areas are more likely to participate in sports (Fejgin, 1994), and in some contexts, high school athletes have stronger academic backgrounds than nonathletes (McNeal, 1999). Moreover, individual student's motivations for participating in sports may be one of the most salient factors for variation in the effect of sports participation (Guest & Schneider, 2003). Thus taking account of selection into sports is a priority (Feldman & Matjasko, 2005; Videon, 2002). This study uses propensity score modeling techniques in an attempt to best account for selection.

In addition to addressing selection bias, locating gender and race differences in the selective processes of diverse students into high school sports may increase our understanding of any differences in the estimated effect of sports on college enrollment. Girls' lower participation rates (Miller, Melnick, Barnes, Farrell, & Sabo, 2005) indicate that selection into sports is not consistent across the population. One of the primary intentions of *Title IX* was to build the athletic opportunities available to secondary and postsecondary female students. Whereas girls comprised about 7% of high school

athletes in the 1971-1972 school year, that proportion increased to 41% in the 2001-2002 school year (National Collegiate Athletic Association, 2011). Although cultural attitudes regarding girls in sports shifted through these three decades (Miller et al., 1998), sports remain a domain of masculinity (Messner, 1990; Shakib & Dunbar, 2002). These structural and cultural forces impact girls' decisions to participate in high school sports as well as their motivation for participating (Cooky, 2009); they may also result in sports participation providing fewer benefits for the college-going of girls than boys.

Black boys participate in high school sports at higher rates than any other race-gender subgroup (as of the most recent study, of a 1980s cohort; Snyder & Spreitzer, 1990). Researchers suggest that athletics has become internalized as part of the Black racial identity, with persisting stereotypes of their superiority in athletic pursuits (Harrison, Azzarito, & Burden, 2004). As one of the few social realms in which being Black is perceived as an asset, sports may be emphasized within the Black community as a means of social mobility (Braddock, 1981; Snyder & Spreitzer, 1990). Black boys' higher rates of participation and potentially distinctive orientations toward athletics may differentiate the impact that participation has on college enrollment for them. Very little research has focused on the sports participation of Hispanic boys and girls, and Black girls. Black and Hispanic girls have been found to engage in lower levels of physical activity and sports, particularly those from lower SES backgrounds (Videon, 2002). Identifying trends in who participates in high school sports, in terms of gender, race, social background, and academic history, will facilitate a more holistic understanding of the differentiated benefits of participating.

Current Study

This study investigates whether a college-going advantage is evident among high school athletes across each of the last three decades. Our three nationally representative longitudinal data sets—HS&B, NELS, and ELS, which include students who were 10th graders in 1980, 1990, and 2002, respectively—allow us to examine changes over time in the characteristics that predict participation in high school sports. In addition, we estimate the relationship between sports participation and enrolling in college for student athletes after accounting for selection into sports using propensity score modeling. Lastly, we consider variation by race and gender in the characteristics that predict sports participation as well as the association

between sports participation and college enrollment after accounting for these characteristics.

Based on research on the predictors and benefits of high school sports participation, we expect that athletes' college-going advantages will be largely attributable to their more advantaged backgrounds across all three decades, but that an independent effect of sports will remain. Given changes in college enrollment patterns and sports participation, we also expect that sports may better distinguish those who enroll in college in the 2000s compared to the 1980s and 1990s, as students attempt to create admissions profiles that are competitive amidst increasing public demand for college. Finally, research on race and gender differences in sports participation rates and the meaning of sports to students leads us to expect some variations in these patterns by race and gender. Specifically, we expect that the differences in background between female athletes and female nonathletes will be greater than the differences among boys, because of gendered barriers to sports participation. This difference should be less evident in later cohorts as it has become more acceptable for girls to participate in sports. In addition, we expect that female and racial minority (particularly Black male) athletes will experience an attenuated advantage in college-going compared to White male athletes, due in part to different motivations for participating and differences across sports programs.

Data and Method

We use data from three surveys, HS&B, NELS, and ELS, which were all collected by the National Center for Education Statistics (NCES) and contain a wealth of academic, sociodemographic, and school contextual information on students who were high school sophomores in the springs of 1980, 1990, and 2002. Our analytic samples include students who participated in the 10th- and 12th-grade surveys, have high school transcript data, and who reported on their college enrollment status 2 years after most students had graduated from high school. The analytic sample sizes are approximately 10,730 for HS&B, 9,550 for NELS, and 11,240 for ELS. (NCES requires that frequencies are rounded to the nearest 10 to protect confidentiality.) These data sets are ideal for this study because all focus on nationally representative samples of 10th graders and because measures are comparable across data sets since all were collected by NCES. Moreover, this study builds on prior knowledge by employing more sophisticated analytic methods with two data sets (HS&B and NELS) used previously to study this topic.

Our outcome of interest is college enrollment. We define this by the first postsecondary institution in which the student was enrolled for at least 3 months, as reported in the student survey administered 2 years after most students completed high school. Given differences in admissions processes and selection, including recruitment of athletes, between 2-year and 4-year colleges, our constructed measure of college enrollment distinguishes among (a) students who had no postsecondary enrollment, (b) students who first enrolled in a 2-year college or who attended a 4-year college part-time, and (c) students who first enrolled full-time at a 4-year college. We code students who enrolled in a 2-year college during the summer after high school, but then enrolled full-time at a 4-year college during the fall, as first enrolling in a 4-year college.

We construct our measure of sports participation by summarizing every available measure from student surveys and transcripts into a dichotomous indicator for each student. We focus on students who consistently participated in sports (as indicated by measures of participation from both 10th- and 12th-grade surveys in these data sets) because previous literature and our exploratory analyses show that these athletes experience the most benefits (Fejgin, 1994). In other words, students who showed no indication of participating in sports by the 12th grade were not categorized as athletes. It is not possible to distinguish between in- and out-of-school sports in HS&B, so we include out-of-school sports in our measure of sports participation in NELS and ELS for consistency. We exclude some traditionally female sports, such as cheerleading, dance, pep squad, and so forth, from our measure of sports participation, because researchers have described these activities as markedly different from traditional conceptions of sports (Broh, 2002; Hanson & Kraus, 1998). We cannot make further distinctions between traditionally female and male sports because of limitations in measures available across all three data sets; both traditionally male (e.g., lacrosse, hockey) and traditionally female (e.g., volleyball, gymnastics) sports are grouped within NCES categories of "individual" or "team" sports.

Guided by previous research on high school sports participation and benefits, as well as exploratory analysis, we identified student and school characteristics available in each data set that were correlated both with participating in sports and enrolling in college. *Student background characteristics* include race, gender, socioeconomic status (SES), family structure, maternal employment status, native language, age at time of survey, and whether a parent reported that the student has a cognitive or physical disability. Because of a lack of consistency in the categorization of family income across the three data sets, we utilize the SES composites available in each data set.

The student's SES is further tapped through an index of household material capital (sum of the presence of a daily newspaper, typewriter/computer, electric dishwasher, more than 50 books, and a room for the student alone in the household).

We measure student *academic background* with 9th-grade GPA, 9th-grade math course level (ordinal—no math, remedial, applied, Pre-Algebra, Algebra I, Geometry, Algebra II, or a more advanced math), 10th-grade reading test score, and student reports of having ever taken remedial English or math. We also include a sum of extracurricular activities (excluding sports) engaged in by the student and the number of hours worked per week. We include an ordinal measure of the student's educational expectations and a sum of the number of people (student's father, mother, and friend/relative/other) students believe expect that they will attend college. *School-level characteristics* include region, urbanicity, school type (public, private, or Catholic), and two dichotomous measures of whether the proportions of racial minority and poor (eligible for the free lunch program) students place the school above the 75th percentile within each cohort. We recoded all variables to be as consistent as possible across all three data sets while still retaining substantive meaning within each time period. With the exception of dependent variables and variables of central interest in our study, missing values for all independent variables were addressed with single imputation. Weighted means and proportions for all variables across the three data sets are presented in Table 1.

Analytic Plan

We apply a student-level weight in all analyses to account for survey design, and we estimate robust standard errors that account for clustering in schools in all regression analyses. We begin by examining race and gender differences in high school sports participation and college enrollment over three decades, in Table 2. We then estimate logistic regression models predicting high school sports participation to show race and gender differences in selective processes over time and to create propensity scores (selected coefficients shown in Table 3). To model race and gender differences in selection into sports, we include race-gender interactions with SES, 9th-grade GPA, 9th-grade math class, 10th-grade reading test score, number of significant others expecting college for the student, and the student's own educational expectations. Other interactions were tested, but were statistically insignificant. White males act as the reference group in all models, because, in addition to being interested in whether racial minorities experience fewer benefits than Whites, we are interested in whether females experience fewer benefits from sports than males.

Table 1. Weighted Means and Proportions across Three Decades.

National samples of 10th graders from ...	1980 (HS&B)	1990 (NELS)	2002 (ELS)
Sports participation	0.37	0.47	0.46
College enrollment:			
4-year college	0.28	0.38	0.43
2-year college	0.19	0.27	0.37
No college	0.52	0.35	0.19
Race and gender:			
White males	0.36	0.38	0.31
White females	0.37	0.37	0.32
Hispanic males	0.07	0.05	0.07
Hispanic females	0.06	0.04	0.08
Black males	0.05	0.05	0.06
Black females	0.06	0.05	0.07
Other race	0.02	0.05	0.09
SES	-0.07 (9.17)	-0.06 (10.94)	0.04 (10.84)
Native English speaker	0.95	0.91	0.88
Age at 10th-grade survey	15.58 (8.33)	15.79 (9.10)	15.84 (8.99)
Cognitive disability	0.03	0.08	0.09
Physical disability	0.38	0.12	0.05
Household material capital	3.67 (14.24)	3.71 (16.49)	3.91 (16.64)
Mother employed	0.71	0.93	0.97
Number bio parents in household	1.65 (7.01)	1.57 (8.24)	0.61 (7.33)
Ever in remedial English	0.35	0.19	0.08
Ever in remedial math	0.36	0.20	0.09
9th-grade math class	2.88 (20.22)	3.16 (21.87)	3.70 (23.69)
9th-grade GPA	2.45 (10.34)	2.42 (12.30)	2.79 (12.00)
Score on 10th-grade reading test	50.17 (122.9)	50.18 (140.8)	30.24 (140.8)
Number extracurricular activities	1.19 (14.26)	0.87 (13.75)	0.74 (14.86)
Hours worked per week	1.60 (17.54)	1.37 (20.56)	1.11 (17.46)
Student's educational expectations	2.92 (20.96)	3.63 (21.16)	4.19 (19.80)
Number others expecting college for student	1.60 (14.89)	1.97 (16.65)	2.20 (16.11)
School type:			
Public	0.84	0.90	0.92
Catholic	0.12	0.06	0.05
Other	0.04	0.04	0.03
School region:			
Northeast	0.21	0.19	0.17
Midwest	0.26	0.25	0.26
South	0.37	0.37	0.34
West	0.16	0.18	0.23
School urbanicity:			
Suburban	0.53	0.41	0.52
Urban	0.20	0.29	0.28
Rural	0.28	0.30	0.20
"% students eligible for free lunch	15.22 (230.2)	20.43 (294.5)	20.48 (239.1)
% students racial minorities	20.23 (315.8)	23.95 (404.2)	31.97 (428.3)
Students (<i>n</i>)	10,730	11,300	11,270

Note: Standard deviations in parentheses. "HS&B" = High School and Beyond. "NELS" = National Education Longitudinal Study of 1988. "ELS" = Education Longitudinal Study of 2002.

Next, we estimate the effects of sports participation on college enrollment after accounting for selection into sports. To do so, we first use multinomial logistic regression models to establish the baseline estimated effect of sports participation on college enrollment, distinguishing between 2- and 4-year colleges (selected coefficients in Table 4, Part A). To model differences in the effect of sports participation on college enrollment by race and gender, we include interactions between sports participation and race and gender. Because propensity score techniques are thought to more aptly address selection bias than standard regression modeling (Eide & Ronan, 2001), we next use a propensity score stratification technique. Our propensity score technique is based on strategies developed by Hong and Raudenbush (2005), with a main difference being that we take school characteristics into consideration rather than modeling selection into schools. We divided each cohort into approximately 10 strata based on the propensity scores outputted from the models we present in Table 3, grouping students with a similar risk of participating in sports.

Our final step is to estimate the average effect of sports participation across propensity score strata with multinomial logistic regression models predicting college enrollment with the sports participation indicator, the estimated propensity scores, and dichotomous indicators for all but one of the propensity stratum (the excluded one is the reference group). The propensity score is included in these models to "remove remaining within-stratum bias" (Hong & Raudenbush, 2005, p. 213). We present coefficients for sports participation from the models using propensity score techniques as well as race-gender interactions with sports participation, in Table 4, Part B.

We present marginal effects rather than log odds or odds ratios because marginal effects enable more valid comparisons across logistic models and are more intuitive. Comparing log odds or odds ratios across models can result in invalid comparisons because of issues of scaling unique to logistic models (Allison, 1999; Grodsky, 2007; Hoetker, 2007). Marginal effects represent differences in predicted probabilities, which are considered more intuitive than odds ratios because probabilities have a symmetrical range (–1 to 1), while odds ratios have an asymmetrical range (with negative effects ranging from 0 to 1, and positive effects starting at 1 but going well beyond 2) (Long, 1997). Conditioning on all other variables in the model, marginal effects ("dy/dx") represent average percentage point differences in the predicted probability of the outcome occurring for the group of interest compared to that for the reference group (for dichotomous variables), or the average percentage point change in the predicted probability of the outcome over a one unit change in the predictor (for ordinal and continuous variables).

Results

Trends in Sports Participation and College Enrollment

The weighted proportions in Table 2 show changes in rates of sports participation and college enrollment within and across race-gender subgroups since the 1980s. Although previous research has documented a dramatic increase in girls' sports participation during the years following the passage of Title IX (Stevenson, 2007), our results indicate that the gender gap increased within all races from the 1980s to the 2000s, mainly because of boys' more

Table 2. Gender and Race Differences in Sports participation and College Enrollment across Three Decades.

National samples of 10th graders from ...	1980 (HS&B)	1990 (NELS)	2002 (ELS)	1980 (HS&B)	1990 (NELS)	2002 (ELS)
	White males			White females		
High school sports participation	0.41	0.59	0.57	0.28	0.32	0.39
College enrollment:						
4-year college	0.31	0.44	0.45	0.33	0.49	0.52
2-year college	0.18	0.27	0.34	0.21	0.30	0.36
No college	0.51	0.29	0.20	0.46	0.21	0.12
Students (<i>n</i>)	3,170	3,350	3,220	3,400	3,420	3,470
	Hispanic males			Hispanic females		
Sports participation	0.41	0.54	0.54	0.22	0.24	0.24
College enrollment:						
4-year college	0.10	0.30	0.18	0.17	0.30	0.28
2-year college	0.16	0.35	0.49	0.20	0.35	0.51
No college	0.74	0.34	0.33	0.64	0.35	0.21
Students (<i>n</i>)	1,160	570	730	1,140	600	790
	Black males			Black females		
Sports participation	0.45	0.61	0.61	0.25	0.23	0.28
College enrollment:						
4-year college	0.17	0.31	0.35	0.24	0.48	0.39
2-year college	0.14	0.22	0.35	0.20	0.28	0.40
No college	0.69	0.47	0.30	0.55	0.25	0.21
Students (<i>n</i>)	630	430	630	730	490	730

Note: "HS&B" = High School and Beyond. "NELS" = National Education Longitudinal Study of 1988. "ELS" = Education Longitudinal Study of 2002.

dramatic increases in participation than girls'. A gender gap of approximately 25 percentage points persists into the 2000s. For instance, 0.57 of white males in contrast to 0.39 of white females participated in high school sports during the 2000s. The gender gap is similar within each racial group. Within all three race groups and across all three cohorts, women enrolled in both 2- and 4-year colleges in higher proportions than their male counterparts (Hispanic boys and girls were similar in the 1990s). Across race groups, Whites have maintained the highest and Hispanics the lowest 4-year college enrollment rates in each decade. In sum, persistent racial and gender differentiation in college-going since the 1980s is evident, with Whites and women disproportionately represented among college matriculates.

Who Participates in Sports?

Table 3 shows the characteristics that predict high school sports participation for each cohort as well as race and gender variation in these associations. These characteristics also predict college-going, so it's important to understand which characteristics are more prevalent among athletes and may contribute to the "sports effect." We show selected marginal effects; full tables are available upon request from the authors. The marginal effects ("dy/dx") in Table 3 represent average percentage point differences in the predicted probability of participating in sports. For instance, in the 1990s, the predicted probability of participating in sports was 24 percentage points ($dy/dx = -0.238$) lower for White females than for White males, conditioning on all other factors in the model. We use interaction terms, represented by indented italicized entries under respective main effects, to compare female and racial minority athletes to White male athletes.

Beginning with main effect race and gender differences, we find that White girls (in the 1990s and 2000s) and Hispanic girls (in the 2000s) had significantly lower probabilities of participating in sports on average than White boys (Table 3), conditioning on differences in social background, academic achievement, and school context. In contrast to White boys, the predicted probability of participating in sports was 24 percentage points lower for White girls in the 1990s, 39 percentage points lower for White girls in the 2000s, and 26 percentage points lower for Hispanic girls in the 2000s. Although Black girls participate at much lower rates than White boys at the baseline (Table 2), differences in social and academic background explain their participation gaps. Overall, results suggest that gender but not race gaps persist in sports participation, even after accounting for factors that may select students into sports.

Table 3. Selected Marginal Effects From Logistic Regression Models Predicting High School Sports Participation.

National samples of 10th graders from ...	1980 (HS&B)		1990 (NELS)		2002 (ELS)	
	dy/dx	(SE)	dy/dx	(SE)	dy/dx	(SE)
Race and gender:						
White males (ref)						
White females	-0.063	(0.06)	-0.238	(0.11)	-0.389	(0.07)
Hispanic males	0.167	(0.10)	0.118	(0.19)	0.147	(0.10)
Hispanic females	0.022	(0.10)	-0.043	(0.20)	-0.260	(0.11)
Black males	-0.061	(0.11)	-0.012	(0.21)	0.140	(0.10)
Black females	0.131	(0.10)	0.199	(0.21)	-0.179	(0.12)
SES	0.013	(0.01)	0.056	(0.02)	0.061	(0.02)
White males (ref)						
White females	0.070	0.02	-0.021	(0.03)	0.000	(0.02)
Hispanic males	0.024	(0.02)	-0.077	(0.05)	-0.034	(0.04)
Hispanic females	0.041	(0.03)	-0.064	(0.04)	-0.039	(0.04)
Black males	-0.038	(0.03)	-0.100	(0.05)	-0.042	(0.04)
Black females	0.058	(0.03)	-0.077	(0.04)	0.002	(0.04)
9th-grade GPA	0.084	(0.01)	0.013	(0.02)	0.019	(0.02)
White males (ref)						
White females	-0.013	(0.02)	0.037	(0.03)	0.041	(0.02)
Hispanic males	0.012	(0.02)	-0.003	(0.04)	-0.004	(0.03)
Hispanic females	-0.002	(0.03)	-0.019	(0.06)	0.033	(0.03)
Black males	-0.003	(0.03)	0.017	(0.07)	-0.016	(0.04)
Black females	-0.034	(0.03)	-0.005	(0.05)	0.034	(0.04)
9th-grade math class	0.025	(0.01)	0.013	(0.01)	0.014	(0.01)
White males (ref)						
White females	-0.031	(0.01)	-0.007	(0.01)	-0.002	(0.01)
Hispanic males	-0.022	(0.01)	-0.005	(0.03)	0.018	(0.01)
Hispanic females	0.009	(0.01)	0.013	(0.02)	0.003	(0.02)
Black males	-0.001	(0.01)	-0.036	(0.03)	0.008	(0.01)
Black females	-0.024	(0.01)	-0.017	(0.03)	-0.003	(0.02)
Student's ed. expc.	0.033	(0.01)	0.036	(0.01)	0.040	(0.01)
White males (ref)						
White females	0.006	(0.01)	0.004	(0.02)	-0.003	(0.01)
Hispanic males	-0.018	(0.01)	-0.010	(0.03)	-0.060	(0.02)
Hispanic females	-0.011	(0.01)	0.033	(0.03)	0.000	(0.02)
Black males	-0.001	(0.01)	0.005	(0.03)	-0.024	(0.02)
Black females	-0.027	(0.02)	0.033	(0.03)	-0.028	(0.02)

(continued)

Table 3. (continued)

National samples of 10th graders from ...	1980 (HS&B)		1990 (NELS)		2002 (ELS)	
	dy/dx	(SE)	dy/dx	(SE)	dy/dx	(SE)
Others expect college	0.054	(0.01)	0.041	(0.01)	0.021	(0.01)
White males (<i>ref</i>)						
White females	-0.037	(0.01)	-0.025	(0.02)	0.014	(0.01)
Hispanic males	-0.010	(0.02)	-0.032	(0.03)	0.017	(0.02)
Hispanic females	-0.036	(0.02)	-0.067	(0.03)	-0.037	(0.02)
Black males	-0.016	(0.02)	0.004	(0.03)	0.050	(0.02)
Black females	-0.043	(0.02)	-0.075	(0.04)	-0.001	(0.03)
BIC	2228287.4		2836800.6		3437708.5	

Note: Italicized entries are interactions between the race-gender subgroup and the heading variable. Bolded coefficients are statistically significant differences (at least $p < .05$). Although not shown, all controls in Table 1 are included in these models. These analyses used 14,280 students when predicting sports participation during the 1980s, 13,420 during the 1990s, and 12,490 during the 2000s. "HS&B" = High School and Beyond. "NELS" = National Education Longitudinal Study of 1988. "ELS" = Education Longitudinal Study of 2002.

In general, having higher SES has become increasingly positively associated with participating in sports (Table 3). In contrast to the general lack of a significant association between SES and sports participation in the 1980s, every one unit increase in SES increased the probability of sports participation by 6 percentage points on average in the 1990s and 2000s. White girls and Black girls were the only subgroups during the 1980s whose probabilities of sports participation significantly increased if they had higher SES. Black boys were the exception in the 1990s, with their probability of participating in sports significantly *decreasing* as their SES increased ($dy/dx = 0.056 + [-0.100] = -0.044$). In contrast to SES, academic history was significantly linked with sports participation only in the 1980s. Ninth-grade GPA was positively associated with participating in sports in the 1980s for all athletes and, with the exception of White girls and Hispanic boys, the probability of participating in sports was significantly higher in the 1980s for students who were in a higher level 9th-grade math course.

In each decade, a one-unit increase in the students' own educational expectations was associated with a 3 to 4 percentage point increase on average in their probability of participating in high school sports, with the exception of Hispanic boys in the 2000s. The association between others' educational expectations and sports participation varied considerably by race

and gender: while others' educational expectations significantly increased the likelihood of sports participation in all three decades, there was less of an association for White girls and Black girls in the 1980s, and others' educational expectations actually decreased the predicted probability of participation for Hispanic girls and Black girls in the 1990s. In general, the associations between expectations of college and participating in high school sports have only recently emerged for girls.

In sum, results presented in Table 3 demonstrate variation in the qualities of athletes that might produce temporal, gender, or race differences in the college-going benefits of sports participation, or differences in the extent to which these qualities explain the estimated effect of sports participation. On one hand, more contemporary athletes' higher SES and higher educational expectations relative to nonathletes suggest that athletes of the 2000s may experience a greater advantage in college-going relative to athletes of the 1980s and 1990s. A decreased college-going advantage is suggested, though, by the lesser relationship between academic achievement and sports participation in the 2000s relative to the 1980s. Race and gender differences in the qualities that predict sports participation may result in race and gender differences in the degree to which college-going chances are attributable to their backgrounds. Girls may have experienced fewer college-going benefits from sports participation than White boys in the 1980s and 1990s because their sports participation was less closely tied to others expecting them to go to college. Potential gender differences in what sports may mean for college enrollment are also suggested by girls' lower overall participation rates.

High School Sports Participation and College Enrollment

Table 4 shows the relationship between sports participation and college matriculation in each of the three decades; Part A shows selected marginal effects from baseline models, and Part B shows selected marginal effects from models using propensity score matching. Full models are available by request from the authors. We do not present marginal effects for not enrolling in college because that outcome is conditional on enrolling in a 2- or 4-year college. The marginal effects ("dy/dx") in Table 4 represent average percentage point differences in the predicted probability of enrolling in college for girls and racial minorities in comparison to White boys (the main effect), conditioning on all other variables in the model.

Before accounting for differences in the social and academic backgrounds of athletes and nonathletes, we primarily see a pattern of a college-going advantage for athletes across all three decades, with the most

Table 4. Selected Marginal Effects From Multinomial Logistic Regression Models Predicting College Enrollment.

	Part A: Baseline				Part B: Propensity techniques			
	Pr(2-Year)		Pr(4-Year)		Pr(2-Year)		Pr(4-Year)	
	dy/dx	(SE)	dy/dx	(SE)	dy/dx	(SE)	dy/dx	(SE)
National sample of 10th graders from 1980 (HS&B)								
Sports participation:	0.057	(0.02)	0.238	(0.02)	0.017	(0.02)	0.074	(0.02)
White males (ref)	—		—		—		—	
White females	-0.017	(0.02)	-0.036	(0.03)	-0.007	(0.02)	-0.020	(0.02)
Hispanic males	0.006	(0.04)	-0.031	(0.04)	0.014	(0.04)	0.005	(0.04)
Hispanic females	-0.102	(0.05)	0.037	(0.05)	-0.104	(0.05)	0.025	(0.05)
Black males	-0.003	(0.05)	-0.046	(0.05)	0.009	(0.05)	-0.019	(0.05)
Black females	-0.028	(0.05)	-0.168	(0.05)	0.000	(0.05)	-0.087	(0.04)
National sample of 10th graders from 1990 (NELS)								
Sports participation:	-0.019	(0.02)	0.189	(0.02)	-0.002	(0.02)	0.082	(0.02)
White males (ref)	—		—		—		—	
White females	0.007	(0.03)	0.000	(0.03)	0.010	(0.03)	-0.008	(0.03)
Hispanic males	0.059	(0.05)	-0.060	(0.07)	0.057	(0.05)	-0.021	(0.06)
Hispanic females	-0.106	(0.06)	-0.016	(0.06)	-0.109	(0.06)	0.002	(0.06)
Black males	0.078	(0.07)	-0.024	(0.07)	0.072	(0.07)	0.019	(0.07)
Black females	0.043	(0.06)	-0.184	(0.06)	0.042	(0.06)	-0.159	(0.07)
National sample of 10th graders from 2002 (ELS)								
Sports participation:	-0.044	(0.02)	0.172	(0.02)	-0.002	(0.02)	0.061	(0.02)
White males (ref)	—		—		—		—	
White females	-0.002	(0.03)	0.048	(0.03)	-0.005	(0.03)	0.037	(0.03)
Hispanic males	-0.023	(0.05)	-0.026	(0.05)	-0.033	(0.05)	0.006	(0.05)
Hispanic females	-0.054	(0.05)	0.037	(0.05)	-0.070	(0.05)	0.069	(0.05)
Black males	0.024	(0.05)	-0.116	(0.05)	0.009	(0.05)	-0.077	(0.05)
Black females	-0.037	(0.05)	-0.086	(0.05)	-0.050	(0.05)	-0.049	(0.05)

Note: These selected marginal effects show the main effects of sports participation, and how the estimated sports effect for female and racial minority athletes differs from that for white male athletes (italicized entries). Bolded coefficients are statistically significant differences (at least $p < .05$). See Table 1 or Methods section for all factors accounted for with propensity techniques. These analyses used 10,730 students when predicting college enrollment during the 1980s, 11,300 during the 1990s, and 11,270 during the 2000s. "HS&B" = High School and Beyond. "NELS" = National Education Longitudinal Study of 1988. "ELS" = Education Longitudinal Study of 2002.

benefits evident in the 1980s (Table 4, Part A). Athletes generally had a 24 percentage point advantage in 4-year college enrollment during the 1980s ($dy/dx = 0.238$), a 19 percentage point advantage in the 1990s ($dy/dx = 0.189$), and a 17 percentage point advantage in the 2000s ($dy/dx = 0.172$).

The pattern is similar across diverse groups, with the exception of Black girls, who experienced significantly less college-going benefit from sports participation than White boys in both the 1980s and 1990s. In one example, White male athletes had a 19-percentage point advantage in 4-year college enrollment over nonathletes in the 1990s, whereas Black female athletes only had a 1-percentage point advantage over nonathletes ($dy/dx = 0.189 + [-0.184] = 0.005$). Black male athletes experienced a similarly attenuated 4-year college-going benefit of high school sports in the 2000s. Among Hispanic girls during the 1980s, the probability of 2-year college enrollment was actually lower for athletes than nonathletes. However, in terms of 4-year college enrollment, Hispanic girls experienced a college going benefit from high school sports participation that was not significantly different from the benefit experienced by White boys.

The positive associations between sports participation and 4-year (but not 2-year) college matriculation are also found with propensity score modeling techniques (Table 4, Part B), although the reduction in the estimated effect of sports participation suggests the considerable role of selection in the relationship between sports participation and college-going. For instance, whereas the predicted probability that an athlete would attend a 4-year college was 17 percentage points higher on average than that of nonathletes during the 2000s, there is only a difference of 6 percentage points once we condition on student and school differences. Nonetheless, after conditioning on a multitude of factors, the predicted probability of enrollment in a 4-year college for high school athletes, in contrast to nonathletes, is still 7 percentage points higher in the 1980s, 8 percentage points higher in the 1990s, and 6 percentage points higher in the 2000s, on average. With these techniques, we estimate that Black girls still experience a lesser college-going advantage compared to White boys in the 1980s and 1990s although the size of the difference is attenuated after accounting for selection. These results suggest that, despite the considerable role of selection, participating in sports is associated with a college-going advantage for diverse athletes across the last three decades, with the exception of Black girls in the 1980s and 1990s.

Discussion and Conclusion

The goal of our study was to determine whether college-going benefits of sports participation (a) have changed over the past three decades, and (b) are attributable to the characteristics athletes hold in common before participating. Furthermore, we were interested in whether there are gender or race differences in the predictors and benefits of sports participation, and if those

vary over time. We accomplished this goal by using propensity score techniques with three large nationally representative data sets of students who were 10th graders in 1980, 1990, and 2002. Our findings confirm that the positive benefits of sports on 4-year college-going were still evident in the 2000s and have not increased since the 1980s. Our results show that a good part of the “benefit” of sports participation can be explained by the greater likelihood of more advantaged students to participate in sports, but the positive estimated effect of sports on 4-year college matriculation remains in the 1980s, 1990s, and 2000s, even after accounting for athletes’ prior characteristics with propensity modeling techniques. Black female athletes are the only exception, actually experiencing a 4-year college-going disadvantage during the 1980s and 1990s. There is little evidence that athletes experience an advantage in 2-year college matriculation. While there were some differences in the characteristics of individuals who participate in sports participation among female and racial minority athletes, the coefficient for female, itself, provided the biggest estimated effect on sports participation, with girls significantly less likely to participate than White boys, net of a multitude of other factors. We now explore each of these findings in more depth.

Although the qualities that predict participation in high school sports have changed since the 1980s, the college-going benefits of participating in sports have stayed relatively constant. Athletes have increasingly become more advantaged than nonathletes in terms of socioeconomic background, but having a strong academic history was more closely associated with participation in the 1980s than in the 1990s or 2000s. As predicted by previous literature, the advantaged backgrounds of athletes do contribute to their higher rates of college enrollment. Nonetheless, even with propensity score modeling techniques, we estimate that the probability of attending a 4-year college has remained from 6 to 8 percentage points higher for athletes than for similar nonathletes in the 1980s, 1990s, and 2000s.

Despite the overwhelming focus on Black boys in previous literature on the effects of sports, we found that Black female athletes were the only group who experienced significantly lesser college-going benefits compared to White male athletes during the 1980s and 1990s. Unlike White and Hispanic girls, the social and academic backgrounds of Black girls explained their participation gap with White boys. The relatively disadvantaged backgrounds of Black female athletes may contribute to the lesser benefit they experience from sports participation, potentially through unmeasured differences in their motivations for participating. In fact, having higher SES was negatively associated with sports participation for Black girls in the 1990s, and others’ higher educational expectations were not associated with sports participation for

Black girls in the 1980s or 1990s. These facts suggest that Black girls, unlike other student athletes, may perceive sports as a discrete activity that is not tied to academics or postsecondary pursuits.

Alternatively, and especially because Black boys experienced some of the selective differences experienced by Black girls but still benefited from participating, high school sports programs may be implemented differently for Black girls. Educators may be less likely to encourage college for Black female athletes because of biases (Comeaux & Harrison, 2007). Although we do not have a measure of educators' expectations for each of the data sets, we did find that others having higher educational expectations was not associated with Black girls' likelihood of participating in sports in the 1980s and even predicted a lesser likelihood of participation in the 1990s. Locating the more specific mechanisms that contributed to Black girls' lesser benefits from sports participation may improve the implementation of contemporary sports programs.

Even though we found no gender differences in the estimated effects of sports participation on college matriculation for Whites and Hispanics, the gender gap in sports participation is noteworthy. Although girls' sports participation has increased since the 1980s, the gender gap has grown because of boys' higher rates of increasing participation. Even after controlling for social and academic background, White and Hispanic girls do not participate at rates equivalent to their male counterparts. Previous research attributes this to the persistent social conditioning of girls to not choose sports or to not feel supported in their athletic pursuits (Cooky, 2009; Duquin, 1992). Strikingly, we found gender gaps in participation within each racial group more than 30 years after the passage of Title IX.

Although propensity score modeling techniques are thought to address selection bias more aptly than standard regression modeling (Eide & Ronan, 2001), both analytic strategies are limited by the measures available in the data set. For example, we did not have data on sports participation before high school, and pre-high school sports participation is likely to play an important role in selection into high school sports, as well as to contribute to the precedent differences we observed between athletes and nonathletes (Guest & Schneider, 2003). Other differences such as athletic ability or physical characteristics were also not available. Although it is impossible to distinguish sport type with the measures available in HS&B, it is likely that some types of sports have a stronger effect on academic outcomes than others (Broh, 2002; Marsh & Kleitman, 2003; McNulty Eitle & Eitle, 2002). The use of data from three different surveys is both a strength of our study and presents inherent limitations. It's possible that any temporal differences

actually represent differences in measures across the surveys. This issue is somewhat attenuated by the fact that all three surveys were collected by the National Center for Education Statistics and share many commonalities, in part because they were designed to be comparable. There is not a single data set with rich data on all three of these decades; taken together, these three NCES data sets provide the best opportunity to observe the link between sports and college enrollment over time.

The fact remains that high school sports are associated with educational attainment for most participants. Across the last three decades, diverse students, with the exception of Black girls, have reaped the college-going benefits of high school sports participation. Capitalizing on the educational opportunities available within activities that engage youth, particularly disadvantaged youth, should be a top priority of education policy makers. For instance, when schools are faced with funding cuts, scaling back extracurricular programs like sports could have unintended consequences for students' academic success. The broad and enduring patterns identified in this study lay a foundation for future research on the benefits or lack of benefit from high school sports participation for diverse students as well as other alternative sources of academic and social preparation within our education system.

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