Accounting for Selection in the Academic Impact of High School Sports on White and Black Males

by

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Background

The positive academic associations of high school sports participation extend to outcomes ranging from high school to postsecondary schooling, including better grades, lower drop-out rates, improved social and psychological development, and increased educational aspirations and attainment (Barber et al. 2001; Eder and Parker 1987; Guest and Schneider 2003; Hoffman 2006; Long and Caudill 1991; McNeal 1999; Sabo et al. 1993; Spady 1970; Videon 2002), but it is unclear whether these academic benefits of sports apply to black boys to the same degree as to white boys. Black males participate in high school sports at higher rates than white males, and the academic benefits of sports could have important implications for their educational attainment. Motivations for participating in sports, the experience of sports, and thus the impact of sports may vary by race; moreover, the positive academic benefits of sports may actually reflect the accumulation of qualities possessed by athletes before participating. This paper explores the participation rates and the impact of sports on high school academic outcomes predictive of college-going for white and black boys from the 1980s through the 2000s, with a focus on the role of selection within the effect of sports.

BENEFITS OF SPORTS

Extracurricular activities have generally been linked to outcomes as diverse as improved school achievement, income, and educational and occupational attainment, as well as a reduced likelihood of dropping out of school, using alcohol and drugs, and engaging in criminal activity (Barber et al. 2001; Guest and Schneider 2003; Hoffman

2006). Extracurricular activities fulfill the adolescents' need for "social relatedness," "stimulate youth to evaluate their social beliefs" (Barber et al. 2001: 430), and improve social adjustment and psychosocial development (Guest and Schneider 2003). Sports, in particular, have been "considered an important avenue for the expression of aggression between peers," and a potential site for much gender socialization (Eder and Parker 1987:205). Though, extracurricular activities, in general, are thought to increase visibility and status amongst peers (Eder and Parker 1987), sports are especially singled out as an avenue for status in the adolescent peer group, particularly for males (Coleman 1961; Guest and Schneider 2003). These psycho-social and social benefits of sports should improve academics by virtue of increased self-confidence and attachment to the school.

In addition to building social capital, sports have long been associated with building human capital. Not only are athletes exposed to other motivated students (Hoffman 2006), but they are explicitly taught skills and values that extend beyond the playing field. Coaches teach adolescents to endure discomfort and pain, and to develop toughness, aggression and confidence; also inherent in sports are notions of competition and achievement (Eder and Parker 1987). As with extracurricular activities in general, sports participation has a positive association with grades, educational aspirations and educational attainment (Barber et al. 2001; Braddock 1981; Guest and Schneider 2003; Hoffman 2006). It is even common practice for participation in high school sports to be contingent upon the maintenance of certain academic standards. Sports are attributed with developing the total package of skills – academic, social and psychological – that contribute to educational success and attainment.

COSTS OF SPORTS

On the other hand, there are also negative associations of sports. Higher rates of drinking (Barber et al. 2001; Hoffman 2006) and increased aggressiveness and sexuality (Hoffman 2006; Miller et al. 1998) have been attributed to high school sports participation. Though sports might increase expectations of attending college, expectations do not equal enrollment or completion of college (Videon 2002). William Spady's (1970) finding that the increase in "perceived status" associated with sports was "positively related to goals but negatively related to their fulfillment" potentially undermines research that concluded sports have positive academic associations via non-concrete academic outcomes such as "educational expectations." If not a positive impact, research finds no effect of sports more often than negative impacts.

THE UNIQUE CASE OF THE BLACK BOY

Positive or null, the effect of sports may be differentiated by race. In addition to structural differences in the implementation of sports programs, black boys, on average, diverge from white boys on a wide range of sociodemographic and educational measures. The multitude of statistics comprising the high risk status of black boys augment the implications of potential positive academic associations of sports, but these risk factors may also serve to defuse the positive aspects of sports for them. Black boys' disadvantage begins simply with their status as a racial minority. Thirty percent of black children live in families with incomes below the poverty line, in contrast to 12.8% of white and 27.4% of Hispanic children (Haveman et al. 2004). Being low socioeconomic status (SES) is negatively associated with academic achievement and college-going

(Entwisle 2007; Massey et al. 2002). In addition to higher incidence of poverty, blacks experience concentrated poverty at higher rates than whites (19% versus 6%) (Iceland 2006), and are more likely to be raised in female single-headed households (Ellwood and Jencks 2004). Not only do lower SES parents have lower educational expectations for their children in general (Entwisle 2007), but there are disparities by SES and race in school quality, teacher quality, and peer environment (Phillips and Chin 2004). High school sports might compensate for resources lacking in the homes and schools of minority students, potentially playing a more pivotal role in their academic and social lives than for non-minority students.

While all black children are impacted by the households and social status that they are born into, black males fare worse than black females. For example, with a much wider gap than the white gender gap, 67% of the Bachelor's degrees awarded to blacks are going to females (Buchmann and DiPrete 2006). Any low SES child experiences less role modeling of the middle class behavior expected within the school system (Entwisle 2007); black boys are also much less likely than black females to have a same-gender role model (Buchmann and DiPrete 2006), in part because black men are incarcerated at rates seven to eight times higher than white men (Western et al. 2004). Gender differentiated expectations and treatment are more marked in low SES homes which is thought to contribute to the greater gender gap (favoring females) in reading skills for low SES children (Entwisle 2007). Compounding these issues, the psychological impact of an enduring black male stigma leaves black boys in a tenuous position academically and otherwise (Ferguson 2001; Liebow 1967). With higher high school participation rates

and a greater presence in professional sports for black boys, sports might offer a singular sense of belonging for the black boy.

Though the results are mixed, previous research has shown that there are differences by race in the association between high school sports and academics. Snyder and Spreitzer (1990) found that more athletes go to college regardless of race, but, otherwise, the findings specifically focused on minorities have generally been less clear (Melnick and Sabo 1992). Some research has suggested that disadvantaged students or students in low-performing schools will experience *added* benefit from sports (Guest and Schneider 2003; Hoffman 2006; Videon 2002). In the 1980s, the strongest association for minorities and sports seemed to be increased social status within high school, and any positive academic effects of sports were smaller for black boys than white boys (Braddock 1981; Melnick and Sabo 1992; Sabo et al. 1993). It is also possible that black boys participate in different sports than white boys, coloring the impact of participation. On the other hand, the emphasis placed in urban schools on team sports in their physical education programs may lead to a focus on physical ability at the expense of academics (Wright et al. 2005), of particular relevance for black males (Riess 1980). More research is needed to distinguish the sports effects for black boys from effects found in studies focused on boys en masse or only white boys.

SELECTION EFFECT

The effect of sports may be totally or partially accounted for by selection factors, i.e., the positive academic outcomes of athletes are potentially just a reflection of characteristics held in common among athletes before they engage in the sports. Selection

is an issue within sports participation that most researchers have mentioned but not sufficiently addressed (Barber et al. 2001; McNeal 1999; Melnick and Sabo 1992; Miller et al. 1998; Videon 2002). It is predicted that, in addition to the context and time period, the impact of sports will vary depending on the motivation for participating (Guest and Schneider 2003). It is crucial to understand who (relative to their counterparts, e.g., among black males) chooses to participate in sports to parse out the effects of selection from the effect of actual participation (Videon 2002). In general, regional and school contexts are thought to influence who chooses to participate and the effect of participating (Guest and Schneider 2003; Hoffman 2006; Videon 2002). Rural regions have higher proportions of athletes than urban areas (McNeal 1999; Videon 2002). There are higher proportions of athletes in private schools versus public schools (Videon 2002). Students in large schools or schools with poor climates are less likely to participate in sports, but it is cautioned that large schools could be a proxy for low SES urban schools (McNeal 1999). On average, black boys attend schools with different characteristics than schools attended by white boys, which should differentiate their propensity to participate in sports.

Selection factors may also contribute to racial variation in the effect of sports: if blacks participate in sports for different reasons than white boys, or, in other words, if black athletes vary in characteristics precedent to sports participation from black non-athletes in different ways than white athletes vary from white non-athletes. High school athletes overall are more likely to be high SES and have good grades (McNeal 1999), but these characteristics may not accurately describe each subgroup within the overall average. Though blacks participate in high school athletics at higher rates than any other

group (Snyder and Spreitzer 1990), being a smaller proportionate share of the pool of all athletes makes it possible that the average black athlete is low SES, for example. Low SES males are less academically-oriented and more likely to embrace traditional gender roles and physicality than high SES males (Eder and Parker 1987; Entwisle 2007); furthermore, some theorize that sports are emphasized in the black community because they are perceived as one of the more feasible means of social mobility (Braddock 1981; Snyder and Spreitzer 1990). It is suggested that athletics have even become internalized as part of the black racial identity (Griffith 2007). In contrast, whites or middle-class families may be more likely to perceive sports as something complementary to academics, a component of the "concerted cultivation" of children (Lareau 2003). If black and white male athletes vary in different ways from their non-athlete counterparts, it would be expected that the effect of sports would not be consistent across races.

Despite the positive association between high school sports and college-going, this association may be weaker for black boys if they are more likely to perceive professional sports as the end to high school sports participation. There are higher proportions of blacks than whites in many of the professional sports, and a 1978 study (focusing on males) found that blacks rate themselves higher in sports ability than whites. It is speculated that blacks may view the sports arena as more accessible than other industries (Braddock 1981), as one of the few realms in majority culture wherein being black is an asset. The reality is that less than 10% of high school athletes go on to participate at the collegiate level and the odds of attaining professional athlete status range from 0.001 to 0.002 (Leonard 1996). Additionally, students who are admitted to college through an athletic scholarship will not necessarily be adequately prepared for the

academic aspect of college (Riess 1980). Sports have long been touted as a truly democratic system and thus a means of social mobility, particularly for disadvantaged youth (Riess 1980; Sabo et al. 1993). There is contention though that this is more conventional wisdom than fact (Guest and Schneider 2003; Reiss 1980) and that sports may actually act as an agent of "social reproduction" rather than social mobility (Sabo et al. 1993).

OTHER CONSIDERATIONS

In addition to taking selection into account, it is important to explore whether sports are acting to perpetuate the status quo (Duquin 1990). The "cumulative advantage hypothesis" describes the ability whites have to tap new advantage because of advantages in other areas of life; the "reinforcement hypothesis" positions high schools as institutions that help those who are already advantaged (Sabo et al. 1993). In line with the perpetuation of the status quo, some believe that sports teach athletes to accept hierarchy as legitimate; moreover, sexism and/or racism within sports may differentiate the experience for females and/or minorities (Eder and Parker 1987). These are aspects that have potentially changed with time as we have changed as a society and culture. Guest and Schneider (2003:90-1) state that "the developmental and historical context in which extracurricular participation takes place influences both how it is valued and its effects on subsequent development."

It is important to take into consideration potential changes in the meaning of sports and in the college preparatory process from the 1980s through the 2000s.Though Ralph McNeal (1999) argues that schools have become more academic over time, sports

have potentially converged with the academic world. Being "well-rounded" has become an imperative in the college admissions process (National School Boards Association 2006), and this may cast sports participation as an accompaniment of scholarly achievement moreso than in earlier decades. Despite improvements in average NAEP mathematics assessment scores for all racial subgroups, the 2004 national average score for 17-year-olds was not significantly different from the score in 1973; the white-black gap in 2004 was only slightly smaller than the gap in 1973 (Perle and Moran 2005). In contrast, math course-taking has changed dramatically from 1978 to 2004, with the percentage of 17-year-olds who took Algebra II having increased from 37 to 53 percent, and the percentage of black 17-year-olds who took Algebra II doubling from 1978 to 2004; in 2004, 72% of white and 67% of black 17-year-olds' highest level math course was Algebra II or higher (Perle and Moran 2005). In addition to math course-taking and other "core courses" such as English and science, foreign language courses are an indicator of a college preparatory course load. The increasingly demanding definition of a college preparatory curriculum (Adelman 2006) was taken into consideration in our study through variable construction choices and by only comparing students to other students from the same decade. If white males are participating in sports as an accompaniment to succeeding academically and black males are participating for other reasons, then the characteristics of athletes should vary by race, as should the impacts of participating. This study addresses changes over time and by race with nationally representative data from the 1980s, 1990s, and 2000s, and specifically focuses on the issue of selection through the use of the methodological technique of propensity score matching.

RESEARCH QUESTIONS

1. How have the high school sports participation rates of black boys compared to white boys since the 1980s?
2. How do sports impact the academic outcomes of black and white boys and has that changed since the 1980s?
3. Are the characteristics that predict sports participation consistent between black and white boys and how has this changed since the 1980s? How might these differences influence the estimated impact of sports?

DATA AND METHODS

Three longitudinal nationally representative data sets from the National Center for Education Statistics (NCES) were employed: the sophomore cohort of High School and Beyond (HS&B), the National Education Longitudinal Study of 1988 (NELS:88), and the Education Longitudinal Study of 2002 (ELS:2002). Data from 10th and 12th grade student surveys, parent surveys and transcripts was used; with 10th grade cohorts from the springs of 1980 (HS&B), 1990 (NELS), and 2002 (ELS), the results span the beginnings of three decades. Students who did not participate in both the 10th and 12th grade surveys were filtered from the analytic sample, as were students with invalid weights (only applicable in NELS) (Table 1). Students without transcripts were not filtered since sports participation and course-taking data was also available from the surveys; the transcript and surveys were perceived as complementary data sources. Since the base year in NELS was actually the 8th grade, students who were freshened in NELS' sophomore year were included to maintain comparability with HS&B and ELS. Variables were always selected and recoded in an effort to maintain consistency across the three datasets.

Table 1. NCES Cohort Information

	HSB	NELS	ELS
8th Grade:			
School year	n/a	1987-88	n/a
Sample size	n/a	25,851	n/a
10th Grade:			
School year	1979-80	1989-90	2001-02
Sample size	13,749	18,176	15,360
Schools	1,000	1,012	751
12th Grade:			
School year	1981-1982	1991-92	2003-04
Sample size	14,102	17,161	13,424
Academic Outcomes Sample:			
10th grade participation	BYPART	F2UNIV2C	F1UNIV2A
12th grade participation	FU1PART	F2UNIV2D	F1UNIV2B
All	13,152	13,510	12,652
White boys	3,782	4,546	3,710
Black boys	856	495	740
Weight	FU1WT	F2TRP2WT	F1PNLWT
Propensity Score Sample:			
10th grade participation	BYPART	F2UNIV2C	F1UNIV2A
All	13,749	18,176	15,360
White boys	3,985	5,719	4,339
Black boys	905	730	1,011
Weight	BYWT	F1PNLWT	BYSTUWT

DEPENDENT VARIABLES

Three 12th grade academic outcomes were used to gauge general academic achievement and college readiness: 12th grade math test scores, having taken Algebra II or higher by the 12th grade, and number of foreign language credits by the 12th grade. NCES administered a series of academic tests during both the 10th and 12th grades in all three datasets; it should be noted that changes were made in the content and format of the tests to the end that test scores are not comparable across datasets. The Item Response Theory (IRT) measures of the 12th grade math test scores were chosen since standardized scores are not appropriate in lagged models. Dichotomous measures of math course-taking were created to indicate whether the student had completed Algebra II or higher by the 12th grade. Because of increases in advanced math course-taking over this time

period, exploratory analysis showed that Algebra II was an appropriate benchmark in all three datasets: low enough to not eclipse significant differences in HS&B and high enough to not miss significant differences in ELS. The third outcome was a continuous variable measuring the number of foreign language credits completed by the 12th grade; values greater than 0 but less than 0.33 were recoded to zero with the assumption that 0.33 represents a trimester's worth of credit.

INDEPENDENT VARIABLES

Sports Participation Variables

An assortment of measures from 10th and 12th grade student surveys and transcript data (with the exception of HS&B[1]) were used to create a dichotomous measure of sports participation (Appendix A): '1' indicating participation in the 12th grade or both the 10th and 12th grades. Exploratory analysis demonstrated that students who indicated participation in only the 12th grade or both the 10th and the 12th grade had similarly positive academic outcomes, in contrast to students who indicated participation in only the 10th grade; since a dichotomous measure of sports participation was requisite for the propensity models, we collapsed 12th-grade and 10th-and-12th-grade participators and characterized these participators as sports participators. While the main sports variable includes the in-school team and in-school individual sports as detailed in Appendix A, a separate dichotomous variable was created for traditionally female sports, such as cheerleading, dance, etc., because of potentially different processes; small cell sizes

[1] An NCES contact indicated that the data file used to link the transcript data file IDs with the student survey data file IDs is missing

required that this dichotomous variable indicate participation during 10th and/or 12th grade.

Control Variables

Because of well-documented associations with academic outcomes, and as a preliminary attempt to account for selection into sports, our basic controls included parental education and family structure. Because of divergence in the categories of the NCES parental education variables, the most concise and consistent recoding across all three datasets was three mutually exclusive dichotomous indicators: high school degree or less, some college (reference), college degree or higher. These categories were also substantively meaningful in all three decades despite increasing parental education levels. Family structure was expressed through a dichotomous variable indicating the presence of both the biological father and biological mother in the household. Lastly, the 10th grade math test score (IRT as well) was used as a final control to account for prior academic achievement.

ANALYTIC PLAN

Predicting Academic Outcomes

Our analysis began with simple regression models (OLS for continuous outcome variables and logistic for dichotomous outcome variables) predicting each of the academic outcomes. Theorizing that the process of choosing to participate in sports, as well as the effect of sports, may vary by race, we ran separate models for black boys and white boys so as to have a base of comparison for the race-separate propensity score

models. Pooled models with race-sports interactions were also employed to express the sports effect for black boys relative to white boys. Within both the separate and pooled models, Model 1 estimates the basic effect of sports on the academic outcomes. Model 2 adds controls for parental education and family structure, and Model 3 controls on prior academic achievement with the 10th grade math test score. 10th-12th grade panel weights were centered and used in every model (Table 1).

Propensity Matching Analysis

As selection is a factor often mentioned within high school sports participation but not adequately accounted for by basic regression models, we used propensity matching in order to compare the academic outcomes of athletes specifically to non-athletes with similar precedent individual and school-level characteristics. Students who did not participate in the 10th grade survey were filtered from this analytic sample. Since the first survey in NELS was administered in the 8th grade, freshened students in the NELS' first follow-up were included to maintain comparability with HS&B and ELS. Measures of individual-level and school-level characteristics that preceded sports participation (as much as is possible within the constraints of the datasets) were selected (Table 2) and recoded so that the variables and their categories were consistent across all three datasets; freshened survey variables acted as supplements in cases where survey questions that were asked in the 10th grade in HS&B and ELS were asked during the 8th grade in NELS. Because of the sample size demands of propensity score matching (Rosenbaum and Rubin 1983) and to maintain representativeness, mean and mode

imputation was used to account for missing values on all independent variables except for race and gender. Relevant imputation flags were included in all models.

Propensity scores predicting each student's likelihood of participating in sports based on the wealth of individual and school-level characteristics were outputted through two-level modeling using HLM6 software. All independent variables were grand-mean centered. These models were run separately for black and white boys; depending on the mean characteristics of each subgroup, some independent variables were excluded because of collinearity or for a lack of variation (Table 2). Base year weights (10^{th} grade) for HS&B and ELS and the 8^{th} - 10^{th} grade panel weight for NELS were centered and used at the individual level in every model (Table 1). The models would not run in the HLM6 software until weights of value '0' (NELS) were recoded to '0.01.'

Each white male and black male subgroup within each dataset was divided into smaller 'propensity ranks' until there was no significant difference in the propensity scores within each rank, with white boys requiring between 9 and 11 ranks and black boys requiring between 5 and 8. The balance of each of these ranks was examined by testing the significance of the difference in the means of each independent variable between athletes and non-athletes within each rank. HLM6 was used to predict each academic outcome again with controls for the propensity score and each propensity rank (with Rank0 as the reference variable). The resulting sports coefficients allowed us to better ascertain if sports are a predictor of positive academic outcomes, or if the sports effect is actually a reflection of characteristics that the athletes possessed before the sports treatment. Lastly, to better discern the significant predictors of sports participation across race and time, more parsimonious models were also run in HLM6 with school-

level controls and independent variables within the themes of parental income, parental education, academic orientation and prior academic achievement.

Table 2. Variables Used in HLM Models Predicting Sports Participation

Family and Background

Age
Religion
- Catholic
- Jewish[4]
- Other religion
- No religion
- Protestant (reference)

English First Language Spoken
Physical and Mental Disabilities
- Specific learning disability
- Visual handicap
- Hard of hearing[4]
- Deafness[4]
- Speech disability
- Orthopedic handicap[4]
- Other health impairment[3]
- Other disability[1, 2]
- Other physical disability[1, 3, 4]
- Physical condition which limits you[2, 3]
- Mental retardation[1, 4]
- Emotional[1]

Parent's Highest Level of Education
Mom Works Outside of the Home
Family Structure
- Biological mom and biological dad
- Biological mom and other male
- Biological dad and other female[4]
- Only biological mom
- Only biological dad
- Other family structure (reference)

Other People in Household
- Grandparents in household
- Respondent's children in household
- Other relatives in household
- Non-relatives in household

Family Income
Family Capital
- Possessions: Daily newspaper
- Possessions: Typewriter[3]
- Possessions: Computer[1, 2]
- Possessions: Electric dishwasher
- Possessions: More than 50 books
- Room of own

Academics

Academic Habits
- Time on homework per week
- Forgets paper or pencil
- Forgets book
- Forgets homework
- Late to school

Academic Achievement
- Grades so far in high school
- Remedial English
- Remedial math
- High school program
- Sophomore reading standardized score

Educational Expectations
- After high school plans per father
- After high school plans per mother
- After high school plans per friends/relatives
- Schooling respondent thinks will get
- Schooling mother wants respondent to get

Extracurricular Activities
- Band, orchestra, chorus, etc.
- Hobby clubs
- Subject matter clubs
- Vocational ed clubs
- Community youth clubs
- Junior achievement clubs

Hours worked per week

School Level Characteristics

Percent minority students
Control
- Catholic
- Other private
- Public (reference)

Region
- West
- Midwest
- Northeast
- South (reference)

Urbanicity
- Urban
- Rural
- Suburban (reference)

1 - Not available in HSB
2 - Not available in NELS
3 - Not available in ELS
4 - Excluded for the subgroups in which mean too closely approached zero

Results

DESCRIPTIVE RESULTS

High school sports participation has increased over the years for both black and white boys, but black boys have consistently participated at higher rates than white boys (Table 3). Parental education levels have increased for both groups, but higher proportions of parents of white boys than black boys have bachelor degrees or more, and lesser proportions of parents of white boys have high school degrees or less in all three decades. The proportion of boys who live with both of their biological parents has decreased over the years, but higher proportions of white boys than black boys live with both of their biological parents in all three datasets. This suggests that fundamental differences in the sociodemographic characteristics of black and white boys endure, potentially differentiating the propensity to participate in sports by race, as well as the effect of sports on high school academic outcomes that predict college readiness.

Table 3. Descriptive Statistics

	HSB: 1980-82 (n=13,152)				**NELS: 1990-92** (n=13,510)				**ELS: 2002-04** (n=15,360)			
	White Boys n=3782		**Black Boys** n=856		**White Boys** n=4546		**Black Boys** n=495		**White Boys** n=3710		**Black Boys** n=740	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Sports and Cheerleading Participation												
Late HS sports participation	0.59	*0.57*	0.68	*0.44*	0.66	*0.48*	0.68	*0.56*	0.67	*0.51*	0.72	*0.48*
Any cheerleading, dance, etc. participation	0.06	*0.26*	0.06	*0.22*	0.03	*0.18*	0.08	*0.32*	0.06	*0.26*	0.09	*0.31*
Parents' Highest Level of Education												
4-year college degree or higher	0.18	*0.43*	0.10	*0.26*	0.38	*0.49*	0.17	*0.45*	0.44	*0.53*	0.34	*0.51*
Some college	0.43	*0.55*	0.42	*0.44*	0.39	*0.49*	0.53	*0.59*	0.36	*0.52*	0.43	*0.53*
High school degree or less	0.39	*0.54*	0.48	*0.45*	0.23	*0.43*	0.30	*0.54*	0.20	*0.43*	0.23	*0.45*
Family Structure												
Lives with biological mother and father	0.77	*0.47*	0.45	*0.45*	0.68	*0.47*	0.45	*0.59*	0.67	*0.51*	0.36	*0.51*
Academic Control and Outcomes												
10th grade math test score	14.91	*11.12*	5.67	*7.09*	46.71	*13.50*	35.65	*12.90*	42.24	*12.28*	31.22	*10.71*
12th grade math test score	17.13	*12.14*	7.58	*8.06*	51.77	*13.98*	39.70	*13.47*	53.23	*15.95*	40.09	*13.39*
Completed Algebra II or higher by 12th grade	0.57	*0.57*	0.43	*0.46*	0.65	*0.48*	0.39	*0.58*	0.70	*0.49*	0.58	*0.53*
Foreign language credits by 12th grade	0.82	*1.31*	0.51	*0.81*	1.59	*1.35*	1.12	*1.34*	0.78	*0.44*	0.73	*0.48*

Note: The sample sizes are unweighted, but the descritipive statistics are weighted.

Math test scores cannot be compared across the decades because of changes in the tests (Table 3), but within all three decades, white boys had higher test scores than black boys in both the 10th and 12th grades. The proportion of white boys having completed Algebra II or higher by the 12th grade has increased over the decades, while the proportion of black boys taking high-level math courses actually decreased from the 1980s to 1990s, but then increased into the 2000s. A higher proportion of white boys complete high-level math courses than black boys in all three decades. Both black and white boys experienced an increase in number of foreign language credits from the 1980s to the 1990s and then a decrease from the 1990s to the 2000s. White boys have completed a higher average number of credits in foreign languages than black boys by the 12th grade throughout the decades. Consistent with Adelman's (2006) research, our exploratory analysis shows that students are experiencing higher levels of academic preparedness upon high school graduation, especially in the case of advanced math course-taking; insofar as general trends, a gap in the academic preparedness of black boys versus white boys persists.

MULTIVARIATE ANALYSES

Table 4 summarizes the sports coefficient results from the race-separate and pooled models for all three academic outcomes, as well as the models with comparable control groups constructed by matching propensity scores. Within each outcome, the direction and significance of the sports coefficients are shown for white boys, black boys relative to white boys, and then black boys. The full models are available in Appendix B.

Table 4. Summary of Sports Coefficient Results from Multivariate Analyses

	HSB: 1982									NELS: 1992									ELS: 2004								
	White Boys			Black Boys			Black boys relative to white boys (pooled model)			White Boys			Black Boys			Black boys relative to white boys (pooled model)			White Boys			Black Boys			Black boys relative to white boys (pooled model)		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
OLS Regression Predicting 12th Grade Math Test Scores																											
Is there an association between sports and academics at all? Does that association vary for black boys?																											
Effect of late HS sports participation (Model 1)	**4.45**	***	0.40	**1.75**	*	0.79	**-2.77**	**	1.04	**4.52**	***	0.46	-0.60		1.22	**-4.37**	***	1.31	**3.47**	***	0.51	-0.05		1.03	**-3.49**	**	1.26
Is the effect of sports actually just a reflection of parental characteristics and the academic history of athletes?																											
...with family and academic controls (Model 3)	**1.24**	***	0.24	0.29		0.54	-1.03		0.68	**0.72**	**	0.20	0.14		0.62	-0.26		0.56	0.23		0.24	-0.22		0.48	-0.51		0.59
Does the sports effect remain when athletes are compared to the non-athletes most similar to them in terms of characteristics that preceded sports participation?																											
... with propensity score matching	0.41		0.41	0.79		1.01	n/a			**-1.03**	*	0.50	-0.45		1.62	n/a			0.41		0.49	-0.59		1.00	n/a		
Logistic Regression Predicting Having Taken Algebra II or Higher by 12th Grade																											
Is there an association between sports and academics at all? Does that association vary for black boys?																											
Effect of late HS sports participation (Model 1)	**0.87**	***	0.07	**0.54**	**	0.19	-0.37	+	0.20	**0.85**	***	0.06	-0.21		0.17	**-0.97**	***	0.18	**0.65**	***	0.07	0.12		0.16	**-0.54**	**	0.18
Is the effect of sports actually just a reflection of parental characteristics and the academic history of athletes?																											
...with family and academic controls (Model 3)	**0.58**	***	0.09	0.35		0.26	-0.34		0.27	**0.63**	***	0.08	0.10		0.22	**-0.53**	*	0.22	**0.44**	***	0.09	0.12		0.18	-0.34	+	0.20
Does the sports effect remain when athletes are compared to the non-athletes most similar to them in terms of characteristics that preceded sports participation?																											
... with propensity score matching	**0.31**	***	0.08	**0.44**	*	0.19	n/a			0.08		0.07	-0.05		0.21	n/a			**0.21**	*	0.09	0.07		0.18	n/a		
OLS Regression Predicting Foreign Language Credits Taken by 12th Grade																											
Is there an association between sports and academics at all? Does that association vary for black boys?																											
Effect of late HS sports participation (Model 1)	**0.34**	***	0.05	**0.18**	*	0.08	-0.17		0.12	**0.51**	***	0.04	-0.06		0.11	**-0.53**	***	0.11	**0.15**	***	0.01	**0.11**	**	0.04	-0.04		0.04
Is the effect of sports actually just a reflection of parental characteristics and the academic history of athletes?																											
...with family and academic controls (Model 3)	**0.11**	*	0.04	0.06		0.09	-0.08		0.13	**0.29**	***	0.04	0.10		0.10	**-0.20**	*	0.10	**0.10**	***	0.01	**0.11**	**	0.04	0.01		0.03
Does the sports effect remain when athletes are compared to the non-athletes most similar to them in terms of characteristics that preceded sports participation?																											
... with propensity score matching	0.00		0.04	0.17		0.10	n/a			0.03		0.04	0.04		0.14	n/a			**0.05**	***	0.01	0.04		0.04	n/a		

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. Full models available in Appendix B.

12th Grade Math Test Scores

In the most basic model, enduring sports participation had a significant and positive effect on 12th grade math test scores in 1982, 1992 and 2004 for white boys, but only in 1982 for black boys; the effect of sports on math test scores was significantly less for black boys than white boys in all three decades. After controls for family and prior academics, the only remaining significant sports effects were for white boys in 1982 and 1992, and there were no remaining significant differences between black and white boys in the sports effect. With propensity score matching, no significant positive effects remained and a significant negative effect actually emerged for white boys in 1992. The absolute lack of a sports effect for black boys, with the exception of 1982, suggests that the association between sports and academics is weaker for black boys; but once family and prior academic history is accounted for, there is no significant difference in the sports effect between black and white boys. In fact, with propensity score matching accounting for a wide variety of background and school-level characteristics, the only remaining significant effect was actually a negative effect for boys in 1992, which suggests that selection does play a fundamental role in the positive effect of sports.

Having Taken Algebra II or Higher by the 12th Grade

Similar to the results for math test scores, sports had a significant and positive effect on math course-taking in all three datasets for white boys but only in 1982 for black boys. In the most basic model, the effect of sports on math course-taking was significantly less for black boys than white boys in 1992 and 2004. Parental and academic controls explained the only significant sports effect for black boys (1982), but

the significant positive sports effects remained for white boys in all three decades. With parental and academic controls, the sports effect for black boys was significantly less than for white boys only in 1992. After propensity score matching, significant sports effects still remained in 1982 for both black and white boys and in 2004 for white boys. There is a persistent positive association between high school sports and math course-taking, as evident through sports effects that endured within comparable control groups created by matching propensity scores. Similar to math test scores, sports had a comparably significant positive effect for both black and white boys only in 1982, while the positive effect of sports have been more consistent for white boys across the three decades.

Foreign Language Credits Taken by the 12th Grade

Sports again had a significant and positive effect on foreign language credits in the basic model in all three decades for white boys, but only in 1982 and 2004 for black boys; the effect of sports was also significantly less for black boys only in 1992. After parental and academic controls, all significant sports effects remained with the exception of black boys in 1982; the effect of sports was again significantly less for black boys only in 1992. The only significant sports effect remaining after controlling with a propensity score was the positive effect for white boys in 2004. The results for foreign language credits are consistent insofar as sports seemed to be more of a positive academic effect for black boys in 1982, but have consistently been so for white boys. The one enduring sports effect (2004 for white boys) gives credence to the idea that sports have converged with academics, specifically college-going and only for white boys.

Sports Predictors

Table 5 summarizes results from the parsimonious models that used only select propensity variables to highlight significant associations between certain characteristics and the likelihood of participating in sports; full models are available in Appendix C. Race differences in the predictivity of these characteristic may contribute to understanding the differences in the sports effect by race.

Table 5. Summary of Significant Predictors of Sports Participation

	HSB: 1980-82						NELS: 1990-92						ELS: 2002-04					
	Logistic Regressions Predicting Having Participated in Sports through the 12th Grade																	
	White boys			Black boys relative to white boys			White boys			Black boys relative to white boys			White boys			Black boys relative to white boys		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
How is each of these characteristics associated with choosing to participate in sports?																		
Family income	**0.21**	***	0.04	-0.18		0.14	**0.45**	***	0.04	-0.16	+	0.14	**0.37**	***	0.04	-0.08		0.11
High level of parental education	**0.34**	***	0.09	0.23		0.41	**0.5**	***	0.09	**0.5**	*	0.41	**0.37**	***	0.07	**-0.35**	*	0.17
Student educational expectations	**0.23**	***	0.03	-0.07		0.07	**0.31**	***	0.03	**-0.27**	***	0.07	**0.19**	***	0.03	**-0.19**	**	0.07
Good grades	**0.41**	***	0.05	**-0.28**	*	0.13	**0.5**	***	0.05	**-0.44**	***	0.13	**0.31**	***	0.05	**-0.34**	***	0.13

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. Full models available in Appendix C.

There was no significant difference in any of the datasets between black and white boys in the positive association of income with sports participation (Table 5). In 1982, there were no significant differences between black and white boys in the positive association of high levels of parental education with sports participation. In 1992, the estimated effect of high parental education levels on being a high school athlete was significantly larger for black boys than white boys. In contrast, by 2004, the estimated effect of high parental education levels on being a high school athlete was significantly smaller for black boys than white boys. In 1982, there were no significant differences between black and white boys in high educational expectations predicting sports participation, while in 1992 and 2004, high educational expectations were significantly less predictive of sports participation for black boys than for white boys. Having high grades was significantly

less predictive of sports participation for black boys than for white boys in all three decades.

Conclusion

Black boys continue to participate in high school sports at higher rates than white boys, but sports have positive academic associations for white boys on a more enduring and broad level. A basic association between sports and positive academic outcomes was evident for black boys in 1982, but was consistent across all three decades for white boys. The basic sports effect was often significantly less for black boys than for white boys. If not explained by parental and academic controls, the sports effect for both black and white boys was often accounted for through propensity score matching. The significant sports effects endured with propensity score matching in three out of nine instances for white boys (math course-taking in 1982 and 2004 and foreign language credits in 2004), but only one out of nine for black boys (math course-taking in 1982). Sports are most consistently associated with math course-taking, which is a positive indicator of general academic achievement and college-going. The fact that the sports effect endured for both math course-taking and foreign language credits in 2004 may suggest that the association between sports and academics is increasingly a college-going mechanism, at least for white boys. In sum, selection does account for considerable amount of the academic benefits of sports, but the sports effects that do endure beyond intensive controls are most prevalent for white males.

In addition to sport type and structural differences in the sports experience by race, racial differences in individual characteristics that predict sports participation may be a partial explanation for differences in the effects of sports by race. In 1982, there were no significant differences between black and white boys in the positive predictive

power of parental education and income for sports participation, nor in the positive predictivity of having high educational expectations. 1982 was also the year in which black boys experienced a benefit from sports comparable to that of white boys. The lack of significant difference across races in the association between parental income and sports participation remained consistent through 1992 and 2004; variation occurred though in the association between parental education and sports participation for black boys. In 1992, having educated parents was significantly more predictive of sports participation for black boys, but the student having high educational expectations was significantly less predictive of sports participation for black boys. This may suggest that old notions of sports as social mobility lingered, with higher SES black parents encouraging sports but not necessarily as a means of going to college. By 2004, having educated parents was significantly less predictive of sports for black boys, and the student having high educational expectations was still significantly less predictive of sports participation for black boys. This convergence of black parent and student in 2004 may suggest that the old model of sports as social mobility had abated, but that the new model, with sports being associated with college-going, was still not as relevant for black boys as for white boys. In addition to structural aspects of sports, the racial variation in both the parental and individual characteristics that describe black and white male athletes contributes to explaining the lesser academic effect of sports for black boys.

There are several limitations to this study. The breadth of this study, involving three large datasets and spanning 24 years, and our goal of maintaining comparability across the datasets resulted in variable selection and recoding choices that would not be required if the study had been conducted on only one of the datasets. For example, racial

differences in the sport type might explain some of the differences in the sports effect, but measures to that degree of specificity were not available in HS&B. It is also possible that there is more variation within subgroups, by socioeconomic status, for example, than this study illuminates. This research should also be extended to females and other racial groups, which is already underway.

This study also did not sufficiently account for structural differences in the implementation of sports. For example, the fact that students are selected into high school sports by ability is a blatant instance of selection bias, as well as something that casts the psychosocial and social benefits of sports into a different light than those of other academic and extracurricular experiences. In contrast to Braddock's (1981:347) observation that "the most important finding here is not that there are differences between blacks and whites in educational benefits associated with athletic participation, but that such payoffs, contrary to popular opinion, accrue to black youth as well as white youth," it is important to determine why these differences exist and what policy changes can be made to ensure the equitable implementation of high school sports. The two major contributions of our study include the findings that the positive academic effect of sports has enduringly favored white males and that selection generally plays a central role in the effect of sports on academic outcomes. Both of these findings corroborate the "cumulative advantage hypothesis" and the "reinforcement hypothesis." In order to sufficiently address the latter through educational policy revisions, more research must be conducted on variation across the structural components of high school sports.

Appendix A – Sports Variable Construction

HS&B 10TH GRADE

INDSPRT10 – *Participated in individual sport in school*
CSSC Code 360111 'Sports, Individual'
CSSC Code 360151 'Track and Field' – ELS includes track within individual sports: see F1S41AG
SWIM10 – *Swimming*
CSSC Code 360161 'Aquatics' – ELS and HS&B do not have a swim team variable though NELS does
TMSPRT10 – *Participated in team sport in school*
CSSC Code 360121 'Sports, Team'
GRLSPRT10 – *Participated in a typically female sport in school*
CSSC Code 360131 'Gymnastics'
DANCE10 – *Dance*
CSSC Codes:
500300 Dance, other
500311 Modern Dance for beginners 9
500312 Modern Dance for beginners 10
500313 Modern Dance for beginners 11
500314 Modern Dance for beginners 12
500321 Modern Dance 9, intermediate
500322 Modern Dance 10, intermediate
500323 Modern Dance 11, intermediate
500324 Modern Dance 12, intermediate
500331 Dance 9 advanced
500332 Dance 10 advanced
500333 Dance 11 advanced
500334 Dance 12 advanced
500341 Performing dance group 9
500342 Performing dance group 10
500343 Performing dance group 11
500344 Performing dance group 12
500351 Ballet and Jazz for beginners 9
500352 Ballet and Jazz for beginners 10
500353 Ballet and Jazz for beginners 11
500354 Ballet and Jazz for beginners 12
500361 Ethnic Dance
500371 Square Dance
500381 Aerobic
CHRDRLL10 – *Cheerleading/Drill Team*
CSSC Code 330121 'Pep Squad (Cheerleading)'
CSSC Code 360141 'Drill Team'
BB032C

HS&B 12TH GRADE

INDSPRT12 – *Participated in individual sport in school*
CSSC Code 360111 'Sports, Individual'
CSSC Code 360151 'Track and Field' – ELS includes track within individual sports: see F1S41AG
SWIM12 – *Swimming*
CSSC Code 360161 'Aquatics' – ELS and HS&B do not have a swim team variable though NELS does
TMSPRT12 – *Participated in team sport in school*
CSSC Code 360121 'Sports, Team'
GRLSPRT12 – *Participated in a typically female sport in school*
CSSC Code 360131 'Gymnastics'
DANCE12 – *Dance*
CSSC Codes:
500300 Dance, other
500311 Modern Dance for beginners 9
500312 Modern Dance for beginners 12
500313 Modern Dance for beginners 11
500314 Modern Dance for beginners 12
500321 Modern Dance 9, intermediate
500322 Modern Dance 12, intermediate
500323 Modern Dance 11, intermediate
500324 Modern Dance 12, intermediate
500331 Dance 9 advanced
500332 Dance 12 advanced
500333 Dance 11 advanced
500334 Dance 12 advanced
500341 Performing dance group 9
500342 Performing dance group 12
500343 Performing dance group 11
500344 Performing dance group 12
500351 Ballet and Jazz for beginners 9
500352 Ballet and Jazz for beginners 12
500353 Ballet and Jazz for beginners 11
500354 Ballet and Jazz for beginners 12
500361 Ethnic Dance
500371 Square Dance
500381 Aerobic
CHRDRLL12 – *Cheerleading/Drill Team*
CSSC Code 330121 'Pep Squad (Cheerleading)'
CSSC Code 360141 'Drill Team'
FY38C

NELS 10TH GRADE

INDSPRT10 – *Participated in individual sport in school*
CSSC Code 360111 'Sports, Individual'
CSSC Code 360151 'Track and Field' – ELS includes track within individual sports: see F1S41AG
F1S41AG (interscholastic and intramural)
SWIM10 – *Swimming*
CSSC Code 360161 'Aquatics' – ELS does not have a swim team variable though NELS does
F1S41AE (intramural and interscholastic)
TMSPRT10 – *Participated in team sport in school*
CSSC Code 360121 'Sports, Team'
F1S41AF (other team sport, intramural and interscholastic)
BSSFTBLL10 – *Baseball/Softball*
F1S41AA (intramural and interscholastic)
BSKTBLL10 – *Basketball*
F1S41AB (intramural and interscholastic)
FTBLL10 – *Football*
F1S41AC (intramural and interscholastic)
SCCR10 – *Soccer*
F1S41AD (intramural and interscholastic)
GRLSPRT10 – *Participated in a typically female sport in school*
CSSC Code 360131 'Gymnastics'
DANCE10 – *Dance*
CSSC Codes:
500300 Dance, other
500311 Modern Dance for beginners 9
500312 Modern Dance for beginners 10
500313 Modern Dance for beginners 11
500314 Modern Dance for beginners 12
500321 Modern Dance 9, intermediate
500322 Modern Dance 10, intermediate
500323 Modern Dance 11, intermediate
500324 Modern Dance 12, intermediate
500331 Dance 9 advanced
500332 Dance 10 advanced
500333 Dance 11 advanced
500334 Dance 12 advanced
500341 Performing dance group 9
500342 Performing dance group 10
500343 Performing dance group 11
500344 Performing dance group 12
500351 Ballet and Jazz for beginners 9
500352 Ballet and Jazz for beginners 10
500353 Ballet and Jazz for beginners 11
500354 Ballet and Jazz for beginners 12
500361 Ethnic Dance
500371 Square Dance
500381 Aerobic
CHRDRLL10 – *Cheerleading/Drill Team*
CSSC Code 330121 'Pep Squad (Cheerleading)'
CSSC Code 360141 'Drill Team'
F1S41AH (cheer, intramural and interscholastic)
F1S41AI (drill, intramural and interscholastic)

NELS 12TH GRADE

INDSPRT12 – *Participated in individual sport in school*
CSSC Code 360111 'Sports, Individual'
CSSC Code 360151 'Track and Field' – ELS includes track within individual sports: see F1S41AG
F2S30AB (interscholastic)
F2S30BK (intramural)
SWIM12 – *Swim*
CSSC Code 360161 'Aquatics' – ELS does not have a swim team variable though NELS does
TMSPRT12 – *Participated in team sport in school*
CSSC Code 360121 'Sports, Team'
F2S30AA (interscholastic)
F2S30BJ (intramural)
GRLSPRT12 – *Participated in a typically female sport in school*
CSSC Code 360131 'Gymnastics'
DANCE12 – *Dance*
CSSC Codes:
500300 Dance, other
500311 Modern Dance for beginners 9
500312 Modern Dance for beginners 12
500313 Modern Dance for beginners 11
500314 Modern Dance for beginners 12
500321 Modern Dance 9, intermediate
500322 Modern Dance 12, intermediate
500323 Modern Dance 11, intermediate
500324 Modern Dance 12, intermediate
500331 Dance 9 advanced
500332 Dance 12 advanced
500333 Dance 11 advanced
500334 Dance 12 advanced
500341 Performing dance group 9
500342 Performing dance group 12
500343 Performing dance group 11
500344 Performing dance group 12
500351 Ballet and Jazz for beginners 9
500352 Ballet and Jazz for beginners 12
500353 Ballet and Jazz for beginners 11
500354 Ballet and Jazz for beginners 12
500361 Ethnic Dance
500371 Square Dance
500381 Aerobic
CHRDRLL12 – *Cheerleading/Drill Team*
CSSC Code 330121 'Pep Squad (Cheerleading)'
CSSC Code 360141 'Drill Team'
F2S30AC (interscholastic)

ELS 10TH GRADE

INDSPRT10 – *Participated in individual sport in school*
CSSC Code 360111 'Sports, Individual'
CSSC Code 360151 'Track and Field' – ELS includes track within individual sports: see F1S41AG
BYSOLOSP (composite interscholastic)
BYS39G (intramural)
SWIM10 – *Swimming*
CSSC Code 360161 'Aquatics' – ELS does not have a swim team variable though NELS does

TMSPRT10 – *Participated in team sport in school*
CSSC Code 360121 'Sports, Team'
BYTEAMSP (composite interscholastic)
BYS39F (intramural)
BYS40FC (other team sport, junior varsity)
BYS40FD (other team sport, varsity)
BYS40FE (other team sport, varsity captain/co-captain)
BSSFTBLL10– *Baseball/Softball (these are combined in NELS)*
BYBASEBL (composite interscholastic)
BYS39A (intramural)
BYSOFTBL (composite interscholastic)
BYS39B (intramural)
BSKTBLL10 – *Basketball*
BYBSKTBL (composite interscholastic)
BYS39C (intramural)
FTBLL10 – *Football*
BYFOOTBL (composite interscholastic)
BYS39D (intramural)
SCCR10 – *Soccer*
BYSOCCER (composite interscholastic)
BYS39E (intramural)

GRLSPRT10 – *Participated in a typically female sport in school*
CSSC Code 360131 'Gymnastics'
DANCE10 – *Dance*
CSSC Codes:
500300 Dance, other
500311 Modern Dance for beginners 9
500312 Modern Dance for beginners 10
500313 Modern Dance for beginners 11
500314 Modern Dance for beginners 12
500321 Modern Dance 9, intermediate
500322 Modern Dance 10, intermediate
500323 Modern Dance 11, intermediate
500324 Modern Dance 12, intermediate
500331 Dance 9 advanced
500332 Dance 10 advanced
500333 Dance 11 advanced
500334 Dance 12 advanced
500341 Performing dance group 9
500342 Performing dance group 10
500343 Performing dance group 11
500344 Performing dance group 12
500351 Ballet and Jazz for beginners 9
500352 Ballet and Jazz for beginners 10
500353 Ballet and Jazz for beginners 11
500354 Ballet and Jazz for beginners 12
500361 Ethnic Dance
500371 Square Dance
500381 Aerobics

CHRDRLL10 – *Cheerleading/Drill Team*
CSSC Code 330121 'Pep Squad (Cheerleading)'
CSSC Code 360141 'Drill Team'
BYCHRDRL (composite interscholastic)
BYS39H (intramural)

ELS 12TH GRADE

INDSPRT12 – *Participated in individual sport in school*
CSSC Code 360111 'Sports, Individual'
CSSC Code 360151 'Track and Field' – ELS includes track within individual sports: see F1S41AG
SWIM12 – *Participated in swimming*
CSSC Code 360161 'Aquatics' – ELS does not have a swim team variable though NELS does
TMSPRT12 – *Participated in team sport in school*
CSSC Code 360121 'Sports, Team'
GRLSPRT12 – *Participated in a typically female sport in school*
CSSC Code 360131 'Gymnastics'
DANCE12 – *Dance*
CSSC Codes:
500300 Dance, other
500311 Modern Dance for beginners 9
500312 Modern Dance for beginners 12
500313 Modern Dance for beginners 11
500314 Modern Dance for beginners 12
500321 Modern Dance 9, intermediate
500322 Modern Dance 12, intermediate
500323 Modern Dance 11, intermediate
500324 Modern Dance 12, intermediate
500331 Dance 9 advanced
500332 Dance 12 advanced
500333 Dance 11 advanced
500334 Dance 12 advanced
500341 Performing dance group 9
500342 Performing dance group 12
500343 Performing dance group 11
500344 Performing dance group 12
500351 Ballet and Jazz for beginners 9
500352 Ballet and Jazz for beginners 12
500353 Ballet and Jazz for beginners 11
500354 Ballet and Jazz for beginners 12
500361 Ethnic Dance
500371 Square Dance
500381 Aerobic
CHRDRLL12 – *Cheerleading/Drill Team*
CSSC Code 330121 'Pep Squad (Cheerleading)'
CSSC Code 360141 'Drill Team'

Appendix B – Regression Models Predicting Academic Outcomes

12TH GRADE MATH TEST SCORE – RACE-SEPARATE MODELS

OLS Regression Predicting 12th Grade Math Test Scores
HSB: 1982 (n=13,152)

	White Boys (n=3782)									Black Boys (n=856)								
	Model 1 n=2876			Model 2 n=2659			Model 3 n=2528			Model 1 n=613			Model 2 n=531			Model 3 n=487		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**15.53**	***	0.31	**16.69**	***	0.53	**4.35**	***	0.36	**7.39**	***	0.66	**8.74**	***	0.96	**2.48**	***	0.64
Sports Participation																		
Late HS sports participation	**4.45**	***	0.40	**3.85**	***	0.40	**1.24**	***	0.24	**1.75**	*	0.79	1.35		0.86	0.29		0.54
Early or no HS sports participation (ref)	---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																		
10th and/or 12th grade	-0.37		0.83	-0.60		0.82	0.47		0.47	-2.73	+	1.49	-2.99	+	1.58	-0.21		0.99
Neither grade (ref)	---			---			---			---			---			---		
Parents' Highest Level of Education																		
4-year college degree or higher				**2.69**	***	0.55	0.57	+	0.32				2.70	+	1.55	-0.60		0.93
Some college (ref)				---			---						---			---		
High school degree or less				**-4.27**	***	0.43	**-1.46**	***	0.26				**-2.04**	*	0.84	-0.66		0.52
Family Structure																		
Lives with biological mother and father				**1.10**	*	0.48	0.04		0.28				0.70		0.80	**1.42**	**	0.49
Other family structure (ref)				---			---						---			---		
Previous Academic Control																		
10th grade math test score							**0.87**	***	0.01							**0.90**	***	0.03
R-Square	0.04			0.11			0.71			0.01			0.04			0.68		

* $p < .05$, ** $p < .01$, *** $p < .001$

OLS Regression Predicting 12th Grade Math Test Scores
NELS: 1992 (n=13,510)

	White Boys (n=4546)									Black Boys (n=495)								
	Model 1 n=3952			Model 2 n=3929			Model 3 n=3834			Model 1 n=427			Model 2 n=419			Model 3 n=407		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**48.82**	***	0.38	**46.64**	***	0.52	**7.66**	***	0.37	**40.95**	***	1.07	**40.71**	***	1.23	**6.94**	***	1.16
Sports Participation																		
Late HS sports participation	**4.52**	***	0.46	**2.88**	***	0.45	**0.72**	**	0.20	-0.60		1.22	-1.03		1.20	0.14		0.62
Early or no HS sports participation (ref)	---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																		
10th and/or 12th grade	**-3.90**	**	1.22	**-3.25**	**	1.17	**-1.30**	**	0.50	**-9.09**	***	1.92	**-8.64**	***	1.90	**-1.86**	+	0.97
Neither grade (ref)	---			---			---			---			---			---		
Parents' Highest Level of Education																		
4-year college degree or higher				**6.38**	***	0.48	**1.31**	***	0.21				**4.04**	**	1.49	-0.60		0.75
Some college (ref)				---			---						---			---		
High school degree or less				**-2.90**	***	0.55	0.02		0.24				**-3.84**	**	1.25	-0.30		0.65
Family Structure																		
Lives with biological mother and father				**2.28**	***	0.45	-0.09		0.20				1.46		1.10	**1.29**	*	0.57
Other family structure (ref)				---			---						---			---		
Previous Academic Control																		
10th grade math test score							**0.93**	***	0.01									
R-Square	0.03			0.11			0.84			0.05			0.11			0.78		

* $p < .05$, ** $p < .01$, *** $p < .001$

OLS Regression Predicting 12th Grade Math Test Scores

ELS: 2004 (n=12,652)

	White Boys (n=3710)									Black Boys (n=740)								
	Model 1 n=3690			Model 2 n=3690			Model 3 n=3690			Model 1 n=731			Model 2 n=731			Model 3 n=731		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**50.88**	***	0.42	**47.53**	***	0.57	**5.08**	***	0.49	**40.39**	***	0.89	**37.43**	***	1.05	**5.72**	***	0.83
Sports Participation																		
Late HS sports participation	**3.47**	***	0.51	**2.10**	***	0.49	0.23		0.24	-0.05		1.03	-0.45		1.00	-0.22		0.48
Early or no HS sports participation (ref)	---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																		
10th and/or 12th grade	0.30		0.99	0.60		0.93	0.44		0.46	**-3.35**	*	1.61	**-3.13**	*	1.56	-0.59		0.76
Neither grade (ref)	---			---			---			---			---			---		
Parents' Highest Level of Education																		
4-year college degree or higher				**6.47**	***	0.52	**1.24**	***	0.26				**5.64**	***	1.03	0.85	+	0.51
Some college (ref)				---			---						---			---		
High school degree or less				**-5.19**	***	0.64	**-0.91**	**	0.32				0.48		1.16	-0.02		0.56
Family Structure																		
Lives with biological mother and father				**3.62**	***	0.49	**0.52**	*	0.24				**3.39**	***	0.94	0.84	+	0.46
Other family structure (ref)				---			---						---			---		
Previous Academic Control																		
10th grade math test score							**1.12**	***	0.01							**1.09**	***	0.02
R-Square	0.01			0.12			0.78			0.01			0.07			0.78		

* $p < .05$, ** $p < .01$, *** $p < .001$

12^{TH} GRADE MATH TEST SCORE – POOLED MODELS

OLS Regression Predicting 12th Grade Math Test Scores

	HSB: 1982 (n=13,152)									NELS: 1992 (n=13,510)									ELS: 2004 (n=12,652)								
	Boys (n=6451)									Boys (n=6724)									Boys (n=6228)								
	Model 1 n=4812			Model 2 n=4216			Model 3 n=3932			Model 1 n=5315			Model 2 n=5264			Model 3 n=5120			Model 1 n=6182			Model 2 n=6182			Model 3 n=6182		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**15.56**	***	0.27	**16.28**	***	0.43	**3.97**	***	0.30	**48.83**	***	0.38	**46.67**	***	0.47	**7.85**	***	0.33	**50.98**	***	0.40	**47.18**	***	0.49	**5.24**	***	0.39
Sports Participation																											
10th and 12th or 12th grade only	**4.49**	***	0.35	**3.86**	***	0.36	**1.24**	***	0.22	**4.52**	***	0.45	**2.82**	***	0.44	**0.69**	***	0.19	**3.47**	***	0.49	**2.17**	***	0.47	0.27		0.23
Only 10th or neither grade (ref)	---			---			---			---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																											
10th and/or 12th grade	**-1.36**	*	0.61	**-1.38**	*		0.27		0.37	**-4.07**	***	0.94	**-3.50**	***	0.90	**-1.07**	**	0.39	-1.31	+	0.72	-0.85		0.68	0.04		0.34
Neither grade (ref)	---			---			---			---			---			---			---			---			---		
Race																											
Black	**-8.23**	***	0.86	**-7.01**	***	0.91	-0.49		0.58	**-8.87**	***	1.11	**-7.90**	***	1.07	-0.77		0.47	**-10.80**	***	1.06	**-9.23**	***	1.01	-0.18		0.51
Other Race	**-4.83**	***	0.70	**-3.95**	***	0.76	-0.47		0.46	-1.29		0.93	-0.69		0.90	**0.93**	*	0.39	**-7.30**	***	0.77	**-6.13**	***	0.74	**-0.73**	*	0.37
White (ref)	---			---			---			---			---			---			---			---			---		
Sports Participation Interacted with Race																											
Black	**-2.77**	**	1.04	**-2.70**	**	1.11	-1.03		0.68	**-4.37**	***	1.31	**-3.21**	*	1.26	-0.26		0.56	**-3.49**	**	1.26	**-2.87**	*	1.19	-0.51		0.59
Other Race	**-4.22**	***	0.88	**-3.65**	***	0.95	**-1.35**	*	0.58	**-2.66**	*	1.15	-1.88	+	1.11	-0.43		0.49	0.20		0.96	0.90		0.91	**1.07**	*	0.45
White (ref)	---			---			---			---			---			---			---			---			---		
Parents' Highest Level of Education																											
4-year college degree or higher				**3.40**	***	0.45	**0.59**	*	0.27				**6.79**	***	0.42	**1.29**	***	0.19				**6.62**	***	0.41	**1.16**	***	0.21
Some college (ref)				---			---						---			---						---			---		
High school degree or less				**-3.82**	***	0.34	**-1.20**	***	0.20				**-3.08**	***	0.45	-0.22		0.20				**-3.81**	***	0.47	**-0.64**	**	0.23
Family Structure																											
Lives with biological mother and father				**1.27**	***	0.37	0.26		0.22				**2.15**	***	0.38	-0.00		0.17				**3.68**	***	0.37	**0.60**	**	0.19
Other family structure (ref)				---			---						---			---						---			---		
Previous Academic Control																											
10th grade math test score							**0.88**	***	0.01							**0.92**	***	0.01							**1.11**	***	0.01
R-Square	0.14			0.19			0.73			0.09			0.18			0.85			0.11			0.20			0.80		

* $p < .05$, ** $p < .01$, *** $p < .001$

HAVING TAKEN ALGEBRA II OR HIGHER BY 12TH GRADE – RACE-SEPARATE MODELS

Logistic Regression Predicting Having Taken Algebra II or Higher by 12th Grade
HSB: 1982 (n=13,152)

	White Boys (n=3782)												Black Boys (n=856)											
	Model 1 n=3058				Model 2 n=2814				Model 3 n=2667				Model 1 n=629				Model 2 n=546				Model 3 n=500			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**-0.24**		***	0.05	-0.13			0.095	**-2.34**		***	0.14	**-0.62**		***	0.16	-0.19			0.23	**-1.25**		***	0.31
Sports Participation																								
Late HS sports participation	**0.87**	**2.39**	***	0.07	**0.76**	**2.14**	***	0.07	**0.58**	**1.79**	***	0.09	**0.54**	**1.72**	**	0.19	0.41	1.51	+	0.21	0.35	1.42		0.26
Early or no HS sports participation (ref)	---	---			---	---			---	---			---	---			---	---			---	---		
Cheerleading, Dance, and/or Drill																								
Team Participation																								
10th and/or 12th grade	0.03	1.03		0.14	-0.03	0.97		0.15	0.09	1.09		0.18	**-1.01**	**0.36**	*	0.41	**-1.36**	**0.26**	**	0.47	**-2.12**	**0.12**	**	0.75
Neither grade (ref)	---	---			---	---			---	--			---	---			---	---			---	---		
Parents' Highest Level of Education																								
4-year college degree or higher					**0.62**	**1.86**	***	0.11	**0.32**	**1.38**	*	0.13					0.06	1.06		0.35	-0.25	0.78		0.42
Some college (ref)						---				---								--				---		
High school degree or less					**-0.71**	**0.49**	***	0.08	**-0.45**	**0.64**	***	0.09					**-0.83**	**0.44**	***	0.21	**-0.58**	**0.56**	*	0.25
Family Structure																								
Lives with biological mother and father					**0.27**	**1.31**	**	0.09	0.21	1.23	+	0.11					0.36	1.43	+	0.20	**0.59**	**1.80**	*	0.24
Other family structure (ref)						---				---								---				---		
Previous Academic Control																								
10th grade math test score									**0.15**	**1.16**	***	0.01									**0.14**	**1.15**	***	0.02
-2 Log Likelihood	5336.88				4608.51				3250.367				737.50				591.99				437.42			

* $p < .05$, ** $p < .01$, *** $p < .001$

Logistic Regression Predicting Having Taken Algebra II or Higher by 12th Grade
NELS: 1992 (n=13,510)

	White Boys (n=4546)												Black Boys (n=495)											
	Model 1 n=4546				Model 2 n=4519				Model 3 n=4380				Model 1 n=495				Model 2 n=486				Model 3 n=469			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	0.09		+	0.05	**-0.17**		*	0.08	**-4.70**		***	0.18	-0.22			0.14	-0.22			0.18	**-4.90**		***	0.48
Sports Participation																								
Late HS sports participation	**0.85**	**2.34**	***	0.06	**0.70**	**2.01**	***	0.07	**0.63**	**1.88**	***	0.08	-0.21	0.81		0.17	-0.31	0.73	+	0.18	0.10	1.11		0.22
Early or no HS sports participation (ref)	---	---			---	---			---	---			---	---			---	---			---	---		
Cheerleading, Dance, and/or Drill																								
Team Participation																								
10th and/or 12th grade	-0.33	0.72	+	0.17	-0.31	0.73	+	0.18	-0.07	0.93		0.21	**-1.42**	**0.24**	***	0.39	**-1.38**	**0.25**	***	0.39	-0.64	0.53		0.44
Neither grade (ref)	---	---			---	---			---	--			---	---			---	---			---	---		
Parents' Highest Level of Education																								
4-year college degree or higher					**1.11**	**3.03**	***	0.08	**0.80**	**2.23**	***	0.09					**0.47**	**1.60**	*	0.22	-0.24	0.79		0.29
Some college (ref)						---				---								--				---		
High school degree or less					**-0.27**	**0.76**	***	0.08	0.00	1.00		0.10					-0.27	0.76		0.19	-0.13	0.88		0.23
Family Structure																								
Lives with biological mother and father					0.10	1.11		0.07	**-0.22**	**0.80**	**	0.08					0.07	1.07		0.17	-0.06	0.94		0.21
Other family structure (ref)						---				---								---				---		
Previous Academic Control																								
10th grade math test score									**0.11**	**1.12**	***	0.00									**0.13**	**1.14**	***	0.01
-2 Log Likelihood	5831.04				5492.20				4001.53				911.95				881.77				641.18			

* $p < .05$, ** $p < .01$, *** $p < .001$

Logistic Regression Predicting Having Taken Algebra II or Higher by 12th Grade
ELS: 2004 (n=12,652)

	White Boys (n=3710)												Black Boys (n=740)											
	Model 1 n=3524				Model 2 n=3524				Model 3 n=3524				Model 1 n=674				Model 2 n=674				Model 3 n=674			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**0.42**		***	0.06	-0.04			0.08	**-4.54**		***	0.20	0.24		+	0.14	0.06			0.17	**-2.50**		***	0.32
Sports Participation																								
Late HS sports participation	**0.65**	**1.92**	***	0.07	**0.52**	**1.68**	***	0.07	**0.44**	**1.55**	***	0.09	0.12	1.13		0.16	0.06	1.06		0.17	0.12	1.13		0.18
Early or no HS sports participation (ref)	---	---			---	---			---	---			---	---			---	---			---	---		
Cheerleading, Dance, and/or Drill																								
Team Participation																								
10th and/or 12th grade	-0.03	0.97		0.14	0.02	1.02		0.15	0.06	1.06		0.17	-0.28	0.76		0.25	-0.26	0.77		0.26	-0.02	0.98		0.28
Neither grade (ref)	---	---			---	---			---	--			---	---			---	---			---	---		
Parents' Highest Level of Education																								
4-year college degree or higher					**0.73**	**2.08**	***	0.08	**0.40**	**1.49**	***	0.10					**0.60**	**1.82**	***	0.17	0.31	1.36	+	0.19
Some college (ref)						---				---								--				---		
High school degree or less					**-0.63**	**0.53**	***	0.09	**-0.35**	**0.70**	**	0.11					-0.27	0.76		0.19	-0.34	0.71	+	0.20
Family Structure																								
Lives with biological mother and father					**0.61**	**1.84**	***	0.07	**0.45**	**1.57**	***	0.09					0.28	1.32	+	0.16	0.12	1.13		0.17
Other family structure (ref)						---				---								---				---		
Previous Academic Control																								
10th grade math test score									**0.12**	**1.13**	***	0.00									**0.09**	**1.09**	***	0.01
-2 Log Likelihood	4892.63				4588.06				3608.31				1058.62				1032.66				923.74			

* $p < .05$, ** $p < .01$, *** $p < .001$

HAVING TAKEN ALGEBRA II OR HIGHER BY 12^TH GRADE – POOLED MODELS

Logistic Regression Predicting Having Taken Algebra II or Higher by 12th Grade

	HSB: 1982 (n=13,152) Boys (n=6451)											
	Model 1 n=5078				Model 2 n=4448				Model 3 n=4132			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**-0.24**		***	0.05	-0.14			0.09	**-2.30**		***	
Sports Participation												
10th and 12th or 12th grade only	**0.87**	**2.39**	***	0.07	**0.76**	**2.14**	***	0.07	**0.58**	**1.79**	***	0.09
Only 10th or neither grade (ref)	---	---			---	---			---	---		
Cheerleading, Dance, and/or Drill Team Participation												
10th and/or 12th grade	-0.09	0.91		0.11	-0.12	0.89		0.12	0.07	1.07		0.15
Neither grade (ref)	---	---			---	---			---	---		
Race												
Black	**-0.41**	**0.66**	*	0.17	-0.14	0.87		0.19	**1.07**	**2.92**	***	0.23
Other Race	**-0.31**	**0.73**	*	0.13	**-0.33**	**0.72**	*	0.15	0.33	1.39	+	0.18
White (ref)	---	---			---	---			---	---		
Sports Participation Interacted with Race												
Black	-0.37	0.69	+	0.20	-0.43	0.65	+	0.22	-0.34	0.71		0.27
Other Race	**-0.48**	**0.62**	**	0.16	-0.30	0.74		0.19	-0.14	0.87		0.23
White (ref)	---	---			---	---			---	---		
Parents' Highest Level of Education												
4-year college degree or higher					**0.64**	**1.90**	***	0.10	**0.30**	**1.35**	**	0.16
Some college (ref)					---	---			---	---		
High school degree or less					**-0.69**	**0.50**	***	0.07	**-0.42**	**0.66**	***	0.08
Family Structure												
Lives with biological mother and father					**0.27**	**1.31**	***	0.07	**0.22**	**1.25**	*	0.09
Other family structure (ref)					---	---			---	---		
Previous Academic Control												
10th grade math test score									**0.15**	**1.16**	***	0.00
-2 Log Likelihood	7198.90				6059.98				4333.62			

	NELS: 1992 (n=13,510) Boys (n=6724)											
	Model 1 n=6148				Model 2 n=6085				Model 3 n=5882			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	0.10		+	0.05	**-0.21**		**	0.07	**-4.72**		***	0.16
Sports Participation												
10th and 12th or 12th grade only	**0.85**	**2.34**	***	0.06	**0.70**	**2.01**	***	0.07	**0.62**	**1.86**	***	0.08
Only 10th or neither grade (ref)	---	---			---	---			---	---		
Cheerleading, Dance, and/or Drill Team Participation												
10th and/or 12th grade	**-0.38**	**0.68**	**	0.14	**-0.37**	**0.69**	*	0.14	-0.13	0.88		0.17
Neither grade (ref)	---	---			---	---			---	---		
Race												
Black	**-0.44**	**0.64**	**	0.15	-0.27	0.76	+	0.15	0.31	1.36	+	0.18
Other Race	-0.19	0.83		0.13	-0.10	0.90		0.13	0.11	1.12		0.16
White (ref)	---	---			---	---			---	---		
Sports Participation Interacted with Race												
Black	**-0.97**	**0.38**	***	0.18	**-0.96**	**0.38**	***	0.19	**-0.53**	**0.59**	*	0.22
Other Race	-0.23	0.79		0.16	-0.15	0.86		0.17	0.14	1.15		0.21
White (ref)	---	---			---	---			---	--		
Parents' Highest Level of Education												
4-year college degree or higher					**1.12**	**3.06**	***	0.07	**0.75**	**2.12**	***	0.08
Some college (ref)					---	---			---	---		
High school degree or less					**-0.24**	**0.79**	***	0.07	-0.02	0.98		0.08
Family Structure												
Lives with biological mother and father					**0.14**	**1.15**	*	0.06	-0.16	0.85	*	0.07
Other family structure (ref)					---	---			---			
Previous Academic Control												
10th grade math test score									**0.11**	**1.12**	***	0.00
-2 Log Likelihood	7879.80				7404.49				5388.57			

	ELS: 2004 (n=12,652) Boys (n=6228)											
	Model 1 n=5859				Model 2 n=5859				Model 3 n=5859			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**0.43**		***	0.06	0.00			0.07	**-4.08**		***	0.15
Sports Participation												
10th and 12th or 12th grade only	**0.66**	**1.93**	***	0.07	**0.53**	**1.70**	***	0.07	**0.45**	**1.57**	***	0.08
Only 10th or neither grade (ref)	---	---			---	---			---	---		
Cheerleading, Dance, and/or Drill Team Participation												
10th and/or 12th grade	**-0.23**	**0.79**	*	0.10	-0.18	0.84	+	0.11	-0.07	0.93		0.12
Neither grade (ref)	---	---			---	---			---	---		
Race												
Black	-0.19	0.83		0.15	0.02	1.02		0.16	**0.91**	**2.48**	***	0.17
Other Race	**-0.49**	**0.61**	***	0.11	**-0.38**	**0.68**	***	0.11	0.04	1.04		0.13
White (ref)	---	---			---	---			---	---		
Sports Participation Interacted with Race												
Black	**-0.54**	**0.58**	**	0.18	**-0.51**	**0.60**	**	0.18	-0.34	0.71	+	0.20
Other Race	-0.16	0.85		0.13	-0.06	0.94		0.14	0.02	1.02		0.16
White (ref)	---	---			---	---			---	---		
Parents' Highest Level of Education												
4-year college degree or higher					**0.71**	**2.03**	***	0.07	**0.37**	**1.45**	***	0.08
Some college (ref)					---	---			---	---		
High school degree or less					**-0.54**	**0.58**	***	0.07	**-0.35**	**0.70**	***	0.08
Family Structure												
Lives with biological mother and father					**0.53**	**1.70**	***	0.06	**0.37**	**1.45**	***	0.07
Other family structure (ref)					---	---			---	---		
Previous Academic Control												
10th grade math test score									**0.11**	**1.12**	***	0.00
-2 Log Likelihood	7846.45				7431.12				6068.52			

* $p < .05$, ** $p < .01$, *** $p < .001$

NUMBER OF FOREIGN LANGUAGE CREDITS BY 12TH GRADE – RACE-SEPARATE MODELS

OLS Regression Predicting Foreign Language Credits
HSB: 1982 (n=13,152)

	White Boys (n=3782)									Black Boys (n=856)								
	Model 1 n=2891			Model 2 n=2663			Model 3 n=2530			Model 1 n=583			Model 2 n=504			Model 3 n=466		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**0.69**	***	0.03	**0.79**	***	0.06	0.12	+	0.07	**0.50**	***	0.07	**0.57**	***	0.10	**0.27**	*	0.11
Sports Participation																		
Late HS sports participation	**0.34**	***	0.05	**0.27**	***	0.05	**0.11**	*	0.04	**0.18**	*	0.08	0.11		0.09	0.06		0.09
Early or no HS sports participation (ref)	---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																		
10th and/or 12th grade	0.02		0.09	-0.02		0.10	0.07		0.09	**-0.39**	*	0.15	**-0.44**	**	0.16	**-0.34**	*	0.16
Neither grade (ref)	---			---			---			---			---			---		
Parents' Highest Level of Education																		
4-year college degree or higher				**0.44**	***	0.64	**0.27**	***	0.06				**0.35**	*	0.09	0.25	+	0.14
Some college (ref)				---			---						---			---		
High school degree or less				**-0.40**	***	0.05	**-0.25**	***	0.05									
Family Structure																		
Lives with biological mother and father				0.08		0.06	0.00		0.05				**0.21**	*	0.08	**0.24**	**	0.08
Other family structure (ref)				---			---						---			---		
Previous Academic Control																		
10th grade math test score							**0.05**	***	0.00							**0.05**	***	0.00
R-Square	0.02			0.08			0.21			0.12			0.07			0.22		

* $p < .05$, ** $p < .01$, *** $p < .001$

OLS Regression Predicting Foreign Language Credits
NELS: 1992 (n=13,510)

	White Boys (n=4546)									Black Boys (n=495)								
	Model 1 n=4546			Model 2 n=4519			Model 3 n=4380			Model 1 n=495			Model 2 n=486			Model 3 n=469		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**1.25**	***	0.03	**1.07**	***	0.05	**-0.76**	***	0.07	**1.22**	***	0.09	**1.17**	***	0.11	**-0.64**	***	0.19
Sports Participation																		
Late HS sports participation	**0.51**	***	0.04	**0.37**	***	0.04	**0.29**	***	0.04	-0.06		0.11	-0.09		0.11	0.10		0.10
Early or no HS sports participation (ref)	---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																		
10th and/or 12th grade	**-0.25**	*	0.11	-0.21	+	0.11	-0.09		0.10	**-0.71**	***	0.19	**-0.65**	***	0.19	-0.31	+	0.16
Neither grade (ref)	---			---			---			---			---			---		
Parents' Highest Level of Education																		
4-year college degree or higher				**0.70**	***	0.03	**0.47**	***	0.04				**0.56**	***	0.14	0.25	+	0.13
Some college (ref)				---			---						---			---		
High school degree or less				**-0.20**	***	0.05	-0.05		0.05				-0.17		0.11	-0.10		0.10
Family Structure																		
Lives with biological mother and father				**0.09**	*	0.04	-0.03		0.04				0.02		0.10	-0.07		0.09
Other family structure (ref)				---			---						---			---		
Previous Academic Control																		
10th grade math test score							**0.04**	***	0.00							**0.05**	***	0.00
R-Square	0.03			0.12			0.29			0.03			0.08			0.30		

* $p < .05$, ** $p < .01$, *** $p < .001$

OLS Regression Predicting Foreign Language Credits

ELS: 2004 (n=12,652)

	White Boys (n=3710)									Black Boys (n=740)								
	Model 1 n=3524			**Model 2** n=3524			**Model 3** n=3524			**Model 1** n=674			**Model 2** n=674			**Model 3** n=674		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**0.68**	***	0.01	**0.62**	***	0.02	**0.07**	**	0.03	**0.65**	***	0.03	**0.63**	***	0.04	**0.17**	**	0.06
Sports Participation																		
Late HS sports participation	**0.15**	***	0.01	**0.12**	***	0.01	**0.10**	***	0.01	**0.11**	**	0.04	**0.10**	**	0.04	**0.11**	**	0.04
Early or no HS sports participation (ref)	---			---			---			---			---			---		
Cheerleading, Dance, etc. Participation																		
10th and/or 12th grade	-0.01		0.03	0.00		0.03	0.00		0.02	-0.06		0.06	-0.06		0.06	-0.01		0.06
Neither grade (ref)	---			---			---			---			---			---		
Parents' Highest Level of Education																		
4-year college degree or higher				**0.11**	***	0.02	**0.04**	**	0.01				**0.11**	**	0.04	0.04		0.04
Some college (ref)				---			---						---			---		
High school degree or less				**-0.13**	***	0.02	**-0.08**	***	0.02				**-0.09**	*	0.04	**-0.10**	*	0.04
Family Structure																		
Lives with biological mother and father				**0.09**	***	0.01	**0.05**	***	0.01				0.05		0.04	0.01		0.03
Other family structure (ref)				---			---						---			---		
Previous Academic Control																		
10th grade math test score							**0.01**	***	0.00							**0.02**	***	0.00
R-Square	0.03			0.09			0.23			0.01			0.05			0.16		

* $p < .05$, ** $p < .01$, *** $p < .001$

NUMBER OF FOREIGN LANGUAGE CREDITS BY 12TH GRADE – POOLED MODELS

OLS Regression Predicting Foreign Language Credits

	HSB: 1982 (n=13,152)								
	Boys (n=6451)								
	Model 1 n=4763			**Model 2** n=4169			**Model 3** n=3898		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**0.70**	***	0.03	**0.76**	***	0.05	0.08		0.05
Sports Participation									
10th and 12th or 12th grade only	**0.34**	***	0.04	**0.28**	***	0.04	**0.11**	**	0.04
Only 10th or neither grade (ref)	---			---			---		
Cheerleading, Dance, etc. Participation									
10th and/or 12th grade	-0.06		0.07	-0.08		0.07	0.04		0.07
Neither grade (ref)	---			---			---		
Race									
Black	**-0.22**	*	0.10	-0.10		0.11	**0.28**	**	0.11
Other Race	**-0.15**	*	0.08	-0.14		0.09	0.10		0.08
White (ref)	---			---			---		
Sports Participation Interacted with Race									
Black	-0.17		0.12	-0.19		0.13	-0.08		0.13
Other Race	-0.17	+	0.10	-0.11		0.11	-0.02		0.10
White (ref)	---			---			---		
Parents' Highest Level of Education									
4-year college degree or higher				**0.46**	***	0.05	**0.29**	***	0.05
Some college (ref)				---			---		
High school degree or less				**-0.37**	***	0.04	**-0.22**	***	0.04
Family Structure									
Lives with biological mother and father				**0.10**	*	0.04	0.04		0.04
Other family structure (ref)				---			---		
Previous Academic Control									
10th grade math test score							**0.05**	***	0.00
R-Square	0.03			0.09			0.22		

	NELS: 1992 (n=13,510)								
	Boys (n=6724)								
	Model 1 n=6148			**Model 2** n=6085			**Model 3** n=5882		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**1.26**	***	0.03	**1.11**	***	0.04	**-0.72**	***	0.06
Sports Participation									
10th and 12th or 12th grade only	**0.51**	***	0.04	**0.38**	***	0.04	**0.29**	***	0.04
Only 10th or neither grade (ref)	---			---			---		
Cheerleading, Dance, etc. Participation									
10th and/or 12th grade	**-0.29**	***	0.09	**-0.27**	**	0.08	-0.11		0.07
Neither grade (ref)	---			---			---		
Race									
Black	-0.11		0.09	-0.01		0.09	**0.27**	***	0.08
Other Race	0.09		0.08	**0.16**	*	0.08	**0.25**	***	0.07
White (ref)	---			---			---		
Sports Participation Interacted with Race									
Black	**-0.53**	***	0.11	**-0.44**	***	0.11	**-0.20**	*	0.10
Other Race	-0.01		0.10	0.05		0.10	-0.09		0.09
White (ref)	---			---			---		
Parents' Highest Level of Education									
4-year college degree or higher				**0.67**	***	0.04	**0.45**	***	0.03
Some college (ref)				---			---		
High school degree or less				**-0.22**	***	0.04	-0.06		0.04
Family Structure									
Lives with biological mother and father				0.05		0.03	-0.03		0.03
Other family structure (ref)				---			---		
Previous Academic Control									
10th grade math test score							**0.04**	***	0.00
R-Square	0.05			0.12			0.29		

	ELS: 2004 (n=12,652)								
	Boys (n=6228)								
	Model 1 n=5859			**Model 2** n=5859			**Model 3** n=5859		
	B	*Sig*	*SE*	*B*	*Sig*	*SE*	*B*	*Sig*	*SE*
Intercept	**0.68**	***	0.01	**0.63**	***	0.01	**0.11**	***	0.02
Sports Participation									
10th and 12th or 12th grade only	**0.15**	***	0.01	**0.12**	***	0.01	**0.10**	***	0.01
Only 10th or neither grade (ref)	---			---			---		
Cheerleading, Dance, etc. Participation									
10th and/or 12th grade	-0.04	+	0.02	-0.03		0.02	-0.02		0.02
Neither grade (ref)	---			---			---		
Race									
Black	-0.03		0.03	0.00		0.03	**0.11**	***	0.03
Other Race	-0.04	+	0.02	-0.02		0.02	**0.05**	*	0.02
White (ref)	---			---			---		
Sports Participation Interacted with Race									
Black	-0.04		0.04	-0.03		0.04	0.01		0.03
Other Race	-0.04		0.03	-0.02		0.03	-0.02		0.03
White (ref)	---			---			---		
Parents' Highest Level of Education									
4-year college degree or higher				**0.11**	***	0.01	**0.04**	**	0.01
Some college (ref)				---			---		
High school degree or less				**-0.13**	***	0.01	**-0.09**	***	0.01
Family Structure									
Lives with biological mother and father				**0.08**	***	0.01	**0.04**	***	0.01
Other family structure (ref)				---			---		
Previous Academic Control									
10th grade math test score							**0.01**	***	0.00
R-Square	0.03			0.09			0.21		

* $p < .05$, ** $p < .01$, *** $p < .001$

Appendix C – Regression Models Predicting Sports Participation

PARENTAL INCOME AND EDUCATION

Logistic Regression Predicting Having Participated in Sports through the 12th Grade

	HSB: 1982 (n=13,152)				NELS: 1992 (n=13,510)				ELS: 2004 (n=15,360)			
	Boys (n=6769) Model 1 n=5200				Boys (n=9089) Model 1 n=7428				Boys (n=7646) Model 1 n=7001			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**0.18**		**	0.06	**-0.12**		*	0.06	**0.21**		***	0.05
Race												
Black	**0.69**	**1.99**	***	0.17	**0.37**	**1.45**	**	0.17	**0.47**	**1.60**	***	0.11
Other Race	-0.10	0.90		0.19	0.16	1.17		0.19	**0.23**	**1.26**	*	0.10
White (ref)	--	--			--	--			--	--		
Parents' Income												
HSB: 0=bottom third, 1=middle third, 2=top third; NELS/ELS: 0=bottom quintile, 1=next two quintiles, 2=top two quintiles	**0.21**	**1.23**	***	0.04	**0.45**	**1.57**	***	0.04	**0.37**	**1.45**	***	0.04
Imputation flag	**-0.33**	**0.72**	***	0.07	**-0.58**	**0.56**	***	0.07	**--**	**--**		
Race Interactions with Parental Income												
Black	-0.18	0.84		0.14	-0.16	0.85	+	0.14	-0.08	0.92		0.11
Other Race	**0.19**	**1.21**	**	0.07	-0.09	0.91	+	0.07	-0.08	0.92		0.06
White (ref)	--	--			--	--			--	--		
-2 Log Likelihood	7727.95				11378.97				9530.96			

Logistic Regression Predicting Having Participated in Sports through the 12th Grade

	HSB: 1982 (n=13,152)				NELS: 1992 (n=13,510)				ELS: 2004 (n=15,360)			
	Boys (n=6769) Model 1 n=5200				Boys (n=9089) Model 1 n=7428				Boys (n=7646) Model 1 n=7001			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**0.50**		***	0.05	**0.38**		***	0.05	**0.54**		***	0.04
Race												
Black	**0.42**	**1.52**	***	0.13	0.01	1.01		0.13	**0.48**	**1.62**	***	0.11
Other Race	0.05	1.05		0.18	-0.09	0.91		0.18	**0.20**	**1.22**	*	0.10
White (ref)	--	--			--	--			--	--		
Parents' Highest Level of Education												
High: BA or higher	**0.34**	**1.40**	***	0.09	**0.50**	**1.65**	***	0.09	**0.37**	**1.45**	***	0.07
Some college (ref)	--	--			--	--			--	--		
Low: HS degree or lower	**-0.34**	**0.71**	***	0.07	**-0.30**	**0.74**	***	0.07	**-0.21**	**0.81**	**	0.08
Imputation flag	**-0.27**	**0.76**	**	0.09	0.35	1.42		0.09	--	--		
Race Interactions with High Parental Education												
Black	0.23	1.26		0.41	**0.50**	**1.65**	*	0.41	**-0.35**	**0.70**	*	0.17
Other Race	-0.36	0.70		0.23	-0.07	0.93		0.23	**-0.34**	**0.71**	**	0.11
White (ref)	--	--			--	--			--	--		
Race Interactions with Low Parental Education												
Black	0.03	1.03		0.19	0.11	1.12		0.19	-0.26	0.77		0.18
Other Race	**0.35**	**1.42**	**	0.12	0.17	1.19		0.12	0.06	1.06		0.11
White (ref)	--	--			--	--			--	--		
-2 Log Likelihood	7726.18				11373.60				9548.48			

ACADEMIC ORIENTATION

Logistic Regression Predicting Having Participated in Sports through the 12th Grade

	HSB: 1982 (n=13,152)				NELS: 1992 (n=13,510)				ELS: 2004 (n=15,360)			
	Boys (n=6769) Model 1				Boys (n=9089) Model 1				Boys (n=7646) Model 1			
	n=5200				n=7428				n=7001			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**-0.38**		***	0.10	**-0.79**		***	0.10	**-0.28**		*	0.10
Race												
Black	**0.76**	**2.14**	*	0.35	**1.45**	**4.26**	***	0.35	**1.33**	**3.78**	***	0.35
Other Race	-0.33	0.72	+	0.20	0.09	1.09		0.20	0.12	1.13		0.20
White (ref)	--	--			--	--			--	--		
Forget Homework												
0=Never, 1=Seldom, 2=Fairly often, 3=Usually	**-0.09**	**0.91**	*	0.04	**-0.11**	**0.90**	**	0.04	**-0.15**	**0.86**	***	0.04
Imputation flag	0.41	1.51	+	0.21	-0.38	0.68		0.21	0.08	1.08		0.21
Level of Schooling Student Expects to Complete												
0=LT HS, 1=HS or GED, 2=Attend or complete 2-year college, 3=Attend 4-year college, 4=Complete 4-college, 5=MA, 6=PHD	**0.23**	**1.26**	***	0.03	**0.31**	**1.36**	***	0.03	**0.19**	**1.21**	***	0.03
Imputation flag	**-0.46**	**0.63**	**	0.15	-0.08	0.92		0.15	**-0.23**	**0.79**	**	0.15
Level of Schooling Mom Expects Student to Complete												
0=LT HS, 1=HS or GED, 2=Attend or complete 2-year college, 3=Attend 4-year college, 4=Complete 4-college, 5=MA, 6=PHD	0.02	1.02		0.03	-0.01	0.99		0.03	0.03	1.03		0.03
Imputation flag	**-0.34**	**0.71**	***	0.07	-0.18	0.84	+	0.07	**-0.37**	**0.69**	***	0.07
High School Program												
0=Vocational, 1=General, 2=Academic	**0.19**	**1.21**	***	0.05	**0.28**	**1.32**	***	0.05	**0.26**	**1.30**	***	0.05
Imputation flag	**-0.56**	**0.57**	**	0.18	**-0.16**	**0.85**	*	0.18	**--**	**--**		
Race Interactions with Forget Homework												
Black	0.02	1.02		0.11	**-0.39**	**0.68**	***	0.11	-0.03	0.97		0.11
Other Race	**0.35**	**1.42**	***	0.08	-0.11	0.90		0.08	**0.14**	**1.15**	*	0.08
White (ref)	--	--			--	--			--	--		
Race Interactions with Student Schooling Expectations												
Black	-0.07	0.93		0.07	**-0.27**	**0.76**	***	0.07	**-0.19**	**0.83**	**	0.07
Other Race	-0.08	0.92		0.06	-0.09	0.91	+	0.06	**-0.08**	**0.92**	*	0.06
White (ref)	--	--			--	--			--	--		
Race Interactions with Mom Schooling Expectations												
Black	0.00	1.00		0.08	0.11	1.12		0.08	-0.01	0.99		0.08
Other Race	0.03	1.03		0.05	0.10	1.11	+	0.05	0.07	1.07	+	0.05
White (ref)	--	--			--	--			--	--		
Race Interactions with HS Program												
Black	-0.05	0.95		0.13	**-0.31**	**0.73**	**	0.13	-0.16	0.85		0.13
Other Race	0.10	1.11		0.12	-0.06	0.94		0.12	-0.14	0.87	+	0.12
White (ref)	--	--			--	--			--	--		
-2 Log Likelihood	7727.95				11566.71				9339.32			

Logistic Regression Predicting Having Participated in Sports through the 12th Grade

	HSB: 1982 (n=13,152)				NELS: 1992 (n=13,510)				ELS: 2004 (n=15,360)			
	Boys (n=6769) Model 1				Boys (n=9089) Model 1				Boys (n=7646) Model 1			
	n=5200				n=7428				n=7001			
	B	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*	*B*	*Exp(B)*	*Sig*	*SE*
Intercept	**-0.54**		**	0.18	**-0.92**		***	0.18	-0.17		+	0.18
Race												
Black	0.55	1.73		0.56	**1.31**	**3.71**	**	0.56	**0.87**	**2.39**	***	0.56
Other Race	-0.22	0.80		0.19	-0.01	0.99		0.19	0.15	1.16		0.19
White (ref)	--	--			--	--			--	--		
Grades So Far in HS												
Rough GPA estimate but HSB is 'grades so far in HS;' NELS are general grades only for math, english, history and science; and ELS is GPA for academic courses in 9th and 10th grade	**0.41**	**1.51**	***	0.05	**0.50**	**1.65**	***	0.05	**0.31**	**1.36**	***	0.05
Imputation flag	-0.64	0.53	+	0.34	-0.30	0.74	+	0.34	**-0.60**	**0.55**	***	0.34
Remedial English												
0=No, 1=Yes	0.14	1.15		0.09	0.01	1.01		0.09	0.34	1.40	+	0.09
Imputation flag	0.03	1.03		0.32	0.60	1.82		0.32	-0.14	0.87		0.32
Remedial Math												
0=No, 1=Yes	**-0.19**	**0.83**	*	0.09	**-0.44**	**0.64**	***	0.09	0.03	1.03		0.09
Imputation flag	-0.11	0.90		0.31	-0.35	0.70		0.31	0.23	1.26		0.31
Sophomore Reading Standardized Score												
Continuous	-0.00	1.00		0.00	0.00	1.00		0.00	-0.00	1.00		0.00
Imputation flag	**-0.35**	**0.70**	***	0.10	**-0.50**	**0.61**	***	0.10	**--**	**--**		
Race Interactions with Grades												
Black	**-0.28**	**0.76**	*	0.13	**-0.44**	**0.64**	***	0.13	**-0.34**	**0.71**	***	0.13
Other Race	-0.09	0.91		0.10	0.01	1.01		0.10	**-0.12**	**0.89**	*	0.10
White (ref)	--	--			--	--			--	--		
Race Interactions with Remedial English												
Black	-0.12	0.89		0.26	0.01	1.01		0.26	0.14	1.15		0.26
Other Race	-0.33	0.72	+	0.19	-0.17	0.84		0.19	0.45	1.57		0.19
White (ref)	--	--			--	--			--	--		
Race Interactions with Remedial Math												
Black	0.15	1.16		0.25	-0.03	0.97		0.25	0.28	1.32		0.25
Other Race	**0.50**	**1.65**	**	0.19	**0.46**	**1.58**	*	0.19	**-0.46**	**0.63**	+	0.19
White (ref)	--	--			--	--			--	--		
Race Interactions with Reading Score												
Black	0.01	1.01		0.01	-0.00	1.00		0.01	0.01	1.01		0.01
Other Race	0.01	1.01	+	0.01	-0.00	1.00		0.01	0.01	1.01	+	0.01
White (ref)	--	--			--	--			--	--		
-2 Log Likelihood	7641.78				11160.97				9492.28			

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