# Returns to High School Athletic Participation: Educational and Labor Market Outcomes

Rachel Salvo

Haverford College

Faculty Advisor: Anne Preston

April 29, 2010

**Abstract**

This paper examines the effect of high school athletic participation on educational attainment and labor market outcomes. Using the 1980 data on seniors from the longitudinal study *High School and Beyond*, Probit regressions were run on high school athletic participation's effect on college attendance and college graduation while OLS models were used to test its effect on wages. Empirical results offer support for previous literature stating that high school athletic participation is beneficial to youth in terms of college attendance as well as wages once in the labor market. However, there was no evidence that high school athletes had a higher probability of graduating from college compared to their non-athletic counterparts.

## I. Background and Introduction

Interscholastic athletics emerged in the United States during the latter half of the nineteenth century and was initially organized and directed by students. The students at Worcester, Massachusetts High School launched high school athletics when they formed a baseball team in 1859. Although some other schools fielded teams during the 1860s, interscholastic athletics was not firmly established until the end of the nineteenth century when social goals of the Progressive movement gave athletics a useful purpose in America's high schools. Progressives wanted to reduce unrest in America's cities so they looked for a way of controlling youth who were affiliated with urban gangs. They believed athletics would keep youth occupied and accelerate their transition into responsible, productive adults. The Public Schools Athletic League was organized in 1903 and became so successful that it was replicated in many American cities, including Washington, DC, where it was adopted for the city's segregated black schools. In 1905, the Girls' Branch was established stressing noncompetitive activities. But in other cities at this time, namely Chicago and Los Angeles, female sports, particularly basketball, were played, though short-lived due to increasing social pressures to mold girls into refined young ladies. High school athletics consequently became the domain of boys. Nonetheless, with high school athletics available, the students began performing better in the classroom and teachers applauded the educational benefits of athletics. Ever since, high school athletics was seen as a necessity and it became an integral part of the high school culture for white males (Jable, 2008).

Black and female athletes, however, experienced an uphill battle to attain entry into interscholastic athletics. Excluded from the beginning, African Americans had to deal with legal segregation policies. Although, female athletes played competitive

interscholastic basketball early on in the 1920s, feminine etiquette and the potential of motherhood caught up with them. Physicians feared playing sports would damage reproductive organs, while educators also denounced competition as unladylike, emphasizing socialization and friendship instead. It was not until the feminist movement of the 1960s and the enactment of Title IX in 1972 that the doors of interscholastic athletics were re-opened for females. Title IX of the Civil Right Act of 1964 stated that any institution receiving federal or state funding might not discriminate against anyone based on sex. Although enforcement is not perfect, the opportunities to participate in high school athletics as well as the sheer numbers of females who do participate have significantly increased (Stevenson, 2008).

It was clear to educators in the nineteenth century that athletics benefited male students. Today, the relationship between high school athletic participation and scholarly achievement is one of the most discussed and debated topics in sport scholarship. There can be significant benefits to interscholastic athletic participation. From looking at the social scientific research, I question what the consequences of participating in high school athletics associated with labor market outcomes are. How does interscholastic athletic participation affect labor market outcomes, specifically wages? With equality and more opportunities, there is also a question as to how high school athletics affect females and those of different races. Do the effects on white males differ from those of a different race or gender? Who is affected most by participating? Furthermore, if high school athletics is beneficial to labor market outcomes, do those who participate in athletic activity after high school have even better labor market outcomes? It is through these questions that one can identify the social subgroups that are in need of constructive, proactive educational programs that can be designed and applied to scholastic sports

participation. Also, a balance between academics and athletes should be found so that student-athletes can experience the best of both worlds in an environment open to both academic and athletic success.

## II. Literature Review

Understanding the effect of interscholastic athletic participation on student achievements has been a focus of recent economic and sociological analysis. Many studies have provided evidence of a positive relationship between athletic participation and educational aspirations, educational attainment, and labor market outcomes. Many different reasons have been offered to account for the strong and significant statistical relationships between athletic involvement and future outcomes. There is a belief that athletics is an inherently social activity that helps to instill virtue, character, and discipline in young people. Athletic participation gives youths the skills and attention necessary for academic and professional success (Hartmann, 2008). Although empirical evidence has demonstrated a strong correlation between sports participation and educational attainment, correlation does not indicate causation. There is ongoing debate about the extent to which the relationship is the direct result of being involved in high school athletes as opposed to being the result of social factors such as parental income or education that are known to determine educational attainment and correlate highly with sports participation. Researchers have been examining how this relationship may be influenced by different types or levels of sport participation as well as how it may operate differently for diverse social groups or under different institutional conditions. The relationship between athletic involvement and academic success can vary depending variables such as the background of the student-athletes involved, school characteristics, and academic expectations. Through analysis using these variables and others, an

association between interscholastic athletic participation and occupational earnings can be made.

Original theories began with James Coleman's *The Adolescent Society,* in which he argues that athletic participation, extracurricular activities, and popularity tend to conflict with educational pursuits. He found that athletes were seen as more popular than scholars and that athletes would dedicate more time to maintaining their reputations rather than focusing on schoolwork (Coleman, 1961). Many studies have followed his pursuit in searching for the relationship between athletic participation and educational pursuits and in fact, have found the opposite. Students who participated in high school sports generally perform better academically and have higher educational expectations than their non-athletic counterparts. Although Coleman's work led him to conclude that athletic participation had a detrimental effect on educational achievement, more studies have established a positive correlation between high school athletic participation and academic achievement, educational expectations, and labor market outcomes.

Soon after Coleman's publication, Rehberg et al. (1968) conducted a study focusing on the effect of specifically high school athletic participation to determine if it had a positive or negative effect on male educational expectations. They suggest two possible linkages between educational expectations and participation. First, if there is a positive association between expectations and participation mediated by higher academic performance due to athletic participation, then the academic performance-athletic participation relationship and the educational expectations-athletic participation relationship will be stronger for boys less disposed to high academic performance. Second, they suggest that the relationship between athletic participation and educational expectation is affected by a student's disposition toward high academic achievement. The

found a strong positive association between expectations and social status ($\gamma$=.50), however, there was no real association between athletic participation and status ($\gamma$=.04). Next, they tested the relationship of academic performance with educational expectations and athletic participation. Educational expectations and academic performance were strongly related ($\gamma$=.71), while academic performance and athletic participation were not related ($\gamma$=-.02). The third control of parental educational encouragement was also tested against educational expectations and athletic participation. There was a positive relationship for both with $\gamma$=.58 for parental encouragement and expectations and a $\gamma$=.28 for encouragement and athletic participation. As a result, Rehberg concluded that the three control variables of social status, academic performance, and parental encouragement, were correlated with educational expectations and that athletic participation, in fact, had an independent and positive effect on educational expectations.

With evidence that Coleman's argument concerning extracurricular activities was flawed, Synder (1969) followed Rehberg and Coleman's studies and examined the adolescent values described by Coleman and asked if a change takes place in the individual's value orientation after high school and what is the relationship between student participation in high school activities and future educational and occupational attainment. He conducted a longitudinal study of the 1962 graduating class in a diversified Mid-western community. He used the control variables of parental socioeconomic status and intelligence (measured by the Henmon-Nelson Test of Mental Ability) and found a positive relationship between educational achievement after high school and social participation. Students who are high in social participation are more likely to be part of the "leading crowd" and based on Coleman's research, these students

are more likely to attend college. He also finds a strong relationship between parental status and social participation. If a parent works a blue-collar job, there is a stronger relationship between social participation and educational achievement. He also found that individuals who had values stressing activities, athletics, and popularity had higher levels of social participation. Five years after graduating from high school, there was no significant relationship between high school vales and educational or occupational achievement. Occupational status, however, was positively correlated with high school social participation with those who had high participation rates in more white-collar jobs. Also, students who were oriented towards athletics and leadership were more likely to complete college than the other students. Although athletic participation itself was not an independent variable, this study proves to be a good basis for further research for athletic participation's effects on future educational expectations and outcomes.

Through these established relationships, they found that one's disposition towards education influenced the effect of athletic participation on educational expectations. Those with low disposition (blue-collar, low intelligence, non-college preparatory students) are more likely to have higher educational aspirations if they participated in high school athletics. Among the high disposed students (white collar, high intelligence, college preparatory school), however, there was no real association since they probably already had high aspirations of attending college. The authors called this a "ceiling" effect because the strength of the relationship between educational expectations and athletic participation lessened as the respondent became "more disposed." There is a general conclusion that athletes are more likely to attend a four-year college than non-athletes. Yet, the authors note that their conclusion must be drawn with caution since they used a non-random sample and all important variables were not controlled for.

Synder et al. (1973) further extended his analysis by testing whether there was a correlation between athletic participation and perceived popularity to delve further into Coleman's associations between popularity and athletics. There was a strong relationship between athletic participation and perceived peer status ($\gamma$=.53) with the strongest relationship among athletes who saw themselves as being very popular. 69% of athletes and 56% of non-athletes expected to obtain a college degree. From those who had low peer status, 44% of both athletes and non-athletes saw themselves graduating from college. From these results, they wanted to see whether these educational expectations among athletes were the same for high schools that value athletics differently. In schools where athletic achievement is rewarded, the relationship between educational expectations and athletic participation is relatively strong ($\gamma$=.48) with 80% of athletes and 57% of non-athletes expected to complete college. In a school where a well-rounded student is rewarded, $\gamma$=.33 and in a school where the scholar is rewarded, $\gamma$=.02. Therefore, both peer status and school climate seemed to make a difference in the athlete-non-athlete differential of educational expectations. Along the same line, the authors lastly observed that there was a clear association between athletic participation and the number of close friends planning on attending college ($\gamma$=.30), especially among "low endowment athletes" defined as those who were in low socioeconomic status, had low IQs and low grades.

The authors reasoned that popularity played such a large role on athletic participation's effect on educational expectations because popular athletes are visible and may receive more encouragement from teachers and guidance counselors. In this study, this proved to be true. Among low endowment boys, 59% of athletes and 32% of non-athletes reported receiving encouragement. They conclude that the influence of sports

participation was related to further education attainment and was strongest for those not predisposed to attend college. Other key variables that influenced educational expectations were school value climate and peer perceived status.

Individual background variables as well as school characteristics seemingly have been key variables in determining the relationship between athletic participation and educational aspirations. However, there have been questions as to what other variables could be essential to expanding the relationship. Piccou et al (1974) chose to study rural athletes living in the South since most past studies focused on urban males in the Northeast. He believed that residence would affect educational expectations because background characteristics and school quality might be lower among individuals living in the South. Other variables beside place of residence that were included were father's education, mother's education, grade point average, parental educational encouragement, educational aspiration, and athletic participation. The authors employed a partial correlation analysis and regression analysis of the data. The educational aspirations of the urban respondents were higher than the rural respondents. However there was a stronger relationship between athletic participation and educational aspirations for the rural seniors (r=.24 rural and .12 urban). The first order partials showed that the zero order relationship between athletic participation and educational aspirations decreased when the control for grade point average was included. The second order partials also showed a decrease in the original relationship with the inclusion of father's education and academic performance together. Like many others, the authors also found a relationship between seniors who were predisposed to college training and educational aspirations. They split up their respondents into either being pre-disposed (upper socio-economic status, high parental educational encouragement, higher GPAs) or non-disposed to

college attendance. They found that predisposed urban athletes had the highest educational aspirations followed by predisposed rural athletes, then non-disposed athletes, and finally non-athletes. This may indicate that athletics has a more significant effect on the educational aspirations of rural youth than urban youth who are not predisposed to college attendance. From the regression analysis, the standardized coefficients showed that athletic participation had only a weak effect on educational aspirations. Parental encouragement and academic performance were found to be the strongest predictors for educational aspirations.

The results indicated that high school athletic participation has a moderately significant effect on educational aspirations. Athletes predisposed to college athletes had the highest educational aspirations. Also, non-disposed to college athletes were shown to have higher educational aspirations than non-disposed non-athletes. Those most affected by athletic participation on educational aspirations are those who received minimal structure and support from adult figures before participating in athletics. The authors believed, however, that other variables could be considered in further research including leadership, scholarship aspirations, and actual athletic success.

As high school athletic participation, along with background variables, have been shown to have strong, positive effects on educational expectations, researchers have gone further and sought to find a relationship between athletic participation and labor market outcomes. Barron et al. (2000) developed a theoretical model for predicting relationship between high school athletic participation and educational and labor market outcomes. They use a two-period model of time allocation based upon time dedicated to leisure or athletic participation assuming that those who decide to participate in athletics allocate time away from leisure and the acquisition of human capital. Through comparative static

analysis, they found changes in parameter values that increase the likelihood of participating in athletics. Their results show that the correlation between high school athletic participation and other variables depend on the reason for participating. They have four potential reasons for participating in athletics: athletic participants reap a greater value to the consumption of athletic activities (A), athletic participants have higher discount factors (B), athletic participants are more capable (C), and athletic participants place a lower value on leisure (D). If factors C and D dominate, then high school athletes are predicted to be more likely to attain further education, enter the labor market, and earn a higher wage. Controlling for demographics, ability, and parental education levels, athletes and non-athletes achieved similar high school percentile rank. Yet, it was seen that those intensely involved actually were ranked higher than the non-athletes. With respect to educational attainment, male athletes received 25-35% more education after high school than non-athletes. They also found that male high school athletes were no more likely to be employed than male non-athletes. However, they do find a relationship between high school athletic participation and higher wages for those who are employed. Wages for males who participated in high school athletics were 12% higher in the NLS-72 and 32% higher in the NLSY than male non-athletes. Once controls were included to account for ability and human capital acquisition in high school, there was a smaller, yet still strong link between athletic participation and higher wages.

To correct for any potential problems with their past regressions (athletic participation could be a regressor correlated with the error term if their controls did not capture all of an individual's abilities), Barron, et al. ran a two-stage least squares regression, containing instrumental variables including high school size, income of

parents, health of the student, private or public school, library books-to-student ratio, faculty-to-student ratio, height and weight of the student, county's mean family income, proportion of families headed by women, and mobility measures. Including these new variables lessened yet still supported the effect of athletic participation on educational attainment. However, the results did not show whether athletic participation had an effect on wage differences between athletes and non-athletes. Yet, this could be due to the quality of their instrumental variables. They also believed that if athletic participation acts as a signal to differences in ability or value of leisure, then athletic participation should also be linked to the type of compensation package one receives. They found that athletic participation was one of the few variables that explained whether pay is based on job performance.

Because of the belief that athletic participation is linked to higher wages, Ewing (1998) asked three questions. Are former high school athletes more likely to work in jobs where pay depends on performance? Are former athletes more likely to be union members? Are athletes in positions where they oversee and coordinate the work of others? To answer these questions, he ran regressions using a tobit model and focused on three measures of work attainment: performance-based pay, union member, and number of workers the respondent supervises. He includes actual experience, actual experience$^2$, tenure, and, tenure$^2$ to capture the total work experience of the respondent. He included the Armed Forces Quality Test score to control for inherent ability and the quality of schooling. He also included controls for industry, occupation, region, urban area, and establishment size. The number of years of schooling was included so that elements of school quality and quantity are incorporated into the regression. Ewing finds that former high school athletes are more likely than non-athletes to work in jobs where pay is based

on performance, more likely to be part of a union, and more likely to be in positions where they supervise others. Athletes may be seen as being competitive and they self-select jobs that allow them to utilize their competitive nature. Also, since athletics is very team-oriented, athletes may opt to be a union member and work in positions involving teamwork. Also, athletics may provide training for leadership; therefore, former athletes have a higher probability of using leadership skills in their occupation. These results support the hypothesis that former high school athletes are more likely to be in jobs associated with better labor market outcomes.

Using the previous model used in his paper with Barron and Waddell, Ewing (2007) took one additional step to look further into the benefits of participating in high school athletics on labor market outcomes, specifically compensation benefits. A two-period time allocation model was again used to measure one's utility based on leisure and compensation of athletics. Again, he believed that the correlation between high school athletics and compensation variables depends on the reason for athletic participation. Using his A-D model, he believed that if A and B were dominant, then athletes would less likely be in the labor force and earn lower wages. On the other hand, if C and D were dominant, then athletes were more likely to enter the labor force and earn higher wages.

To test his predictions, Ewing split compensation into wages and seven categories of fringe benefits – retirement, profit sharing, medical insurance, dental insurance, paid vacation, parental leave, and sick leave. Ewing found that all else being equal, former high-school athletes earned more than non-athletes. He also found that six out of the seven categories of fringe benefits (medical insurance was not) were positively and significantly affected by athletic participation. He concluded that participating in high

school athletics increased the probability of receiving fringe benefits (6 out of the 7) by between 5%-10%. Therefore, former high school athletes were more likely to receive fringe benefits and earn higher wages than non-athletes.

Even the impact of participation in collegiate athletics has been shown to have positive effects on income. Long et al. (1991) hypothesized that athletics increases earning power since athletics promote values and teach life skills necessary for future success such as service, respect, integrity, leadership, perseverance, and teamwork. Using data on individuals during their freshman year of college in 1971 and their labor market activities ten years later, Long was able to determine a relationship between athletics and income using the method of maximum likelihood. He found athletic participation positively and significantly affects income. Male college athletes earned about 4% more than their non-athletic counterparts, adding controls for part-time workers, married individuals, individuals with children, college grades, education level, and an individual's drive. He also compared the graduation rates of collegiate athletes to non-athletes using the logit model and found that male athletes have a 4% higher probability of graduating than non-athletes. However, Long notes that the data he used was limited since it did not take into account institution size.

Although these studies have been very effective in establishing a relationship between athletic participation and outcomes for white males, neither gender nor race has been considered. Stevenson (2008) looked specifically at the effect of Title IX on female athletic participation in high school and this effect on future educational attainment and labor market outcomes. Her data was collected at the state level from the 1970, 1980, 1990, and 2000 Censuses. First, she looked at the effect of athletic participation on education. She found that a 10 percentage point increase in the female athletic

participation rate generates an increase in the average educational attainment of all women by .039 years and a 0.8 percentage point increase in the probability of getting a college degree. Also, a 10 percentage point increase in female sports participation in a state generated an average of 1.3 percentage point increase in the probability that girls in that state get post- secondary education and a 0.1 percentage point increase in the probability of post-college education. Finally, a 10 percentage point increases in state level female sports participation increased average years of education in a state by 0.04 to 0.06 years. She, then, looked at the effect of athletic participation on employment, occupational choice and wages. After adding controls for regional changes and economic conditions at age 18, a 10 percentage point increase in female athletic participation led to 1.3 percentage point increase in the probability of being employed and a 1.3 percentage point increase in the probability of working full-time. She also found a relationship between sports participation and the type of career females choose. A 10 percentage point increase in the opportunities to play high school sports increased the probability of being employed in a sports related occupation by .02-percentage points and a 1.1 percentage point rise in the probability of being employed in a "mixed occupation," a .45 percentage point increase in being employed in a male occupation and a .36 point rise in the probability of being in a female occupation. She concluded that athletic participation is associated with an increase in female employment in high education occupations and an increase in labor force participation, which yields more women with higher wages.

From these results, Stevenson calculated the direct effect that Titles IX had on these variables. Title IX increased athletic participation about 30% and this led to a 4 percentage point increase in female labor force participation and increased some college attainment by 3.5 percentage points and a college degree by 2 percentage points. It was

also associated with 1.5 percentage point increase in the probability that a woman was in a male dominated occupation and a 3 percentage point increase in being in a mixed occupation. Based on these results, Stevenson firmly believes that athletic participation has important causal effects on female educational and labor market outcomes.

One final factor that has seldom been considered is race. Eitle et al. (2002) examined family variables and resources to predict high school participation in athletics and their subsequent effects on academic achievement. They wanted to see if there was a connection between male adolescent cultural capital and household educational resources and the likelihood that he will play a particular sport (football, basketball, other sports). Also, they sought to find out if participation in a certain sport is positively or negatively associated with academic achievement, and whether the influences on academic achievement differ by race. Many studies have found that adult encouragement, school characteristics, and family characteristics are important factors when looking at athletic participation. However, the authors introduce cultural capital, high-status cultural signals that are commonly used for social and cultural inclusion, as an influential factor. To measure cultural capital, they examined how often the respondents took cultural trips (museums) and took "high-cultured" extracurricular classes (dance, art, music). They also took into account the level of educational resources available in the home (books, computers, encyclopedias).

The authors used four models to analyze their data. Models 1 and 2 illustrated the effect of participation in different sports on math-reading scores after controlling for the measures of prior scores. Participation in basketball and football are negatively associated with previous and present academic achievement, regardless of race. Participation in other sports, however, seemed to improve present math-reading scores.

Models 3 and 4 regressed self-reported grades on family socioeconomic status and structure, family cultural and educational resources, and athletic participation, with the control of prior test scores. All else being equal, those in single-parent households had lower grades. Participation in football and basketball did not have a significant effect on self-reported grades when the controls were included. However, participation in other sports had positive effects, but only for white males. The race interaction actually showed that participating in other sports had a negative effect on self-reported grades. The final conclusions the authors came to were: black males were more likely to be involved in sports than whites; differences in cultural capital were strong predictors of participation in basketball and football, but not other sports; the cultural capital measures had a much bigger effect for black males than white males in predicting if they would play basketball; participation in basketball and football had a negative effect on standardized achievement scores; participation in basketball or football had neither benefits nor costs in regards to grades regardless of race; and playing other sports was associated with higher grades for whites but lower grades for blacks. Hence, race can significantly influence the effect of athletic participation on scholarly outcomes.

Taken together, the results indicate a strong, positive effect of interscholastic athletic participation on academic achievement, educational expectations, and labor market outcomes. However, there are still questions as to which variables and characteristics are necessary for attaining accurate results. There is no question that many variables must be included when looking at the correlation between athletic participation and education and employment outcomes. Variations in social background and athletic experiences appear to impact the strength and direction of the statistical correlation between athletic participation and educational attainment and occupational

earnings. Also important to include are school characteristics and adult (parental, coach, teacher) encouragement. The relationships among socioeconomic status, family background, sports participation, and academic achievement are complex. Clearly, more than a few studies have tried to clarify the causal nature and direction of these relationships to prove that it is sports participation itself that is the variable or factor that is producing strong academic performance, educational aspirations, and labor market outcomes. Yet, the general conclusion remains that the benefits of participation in interscholastic athletics can be extensive.

It should be noted, however, that most studies have looked at white males and that there have not been studies using microdata for women. There have also been no good studies looking at the effects of athletic participation by race. The interaction effect between race and athletics participation would show whether those of different races benefit from participating in athletics. Would all the expected reasons for white men to benefit from athletic participation hold for blacks and women? Also, if high school athletes continue playing in college, do they have other reasons for participating? For example, would collegiate athletes benefit more than those who participated solely in high school athletics in terms of earnings? Would the networking effect found in college athletics affect both sexes and all races equally? It will be interesting to see if there are differences among these different groups in regards to their effects on athletic participation and labor market outcomes.

As has been stated in previous research, there are different mechanisms by which athletics can affect labor market outcomes. Athletics can be a source of non-cognitive skills such as motivation, hard work, and dedication that would theoretically hold across races and gender. However, if, athletics is more a source of popularity and networking,

then gender and race might affect labor market outcomes differently. White, male athletes tend to have more of a social network due to alumnae relations in the labor market. Women, on the other hand, usually do not have that luxury since many female alumnae may not be in the labor market. Therefore, I will use my findings on how gender and race affect athletic participation and labor market outcomes to try and get a better understanding of these mechanisms.

**III. Data Description**

The data set used for this analysis was *High School and Beyond*, a longitudinal study conducted for the National Center of Educational Statistics of 58,270 American high school sophomores and seniors from 1,015 different high schools, beginning in 1980 and following into the labor market six years later. At this point, most seniors should have entered the labor market unless some went on to graduate school. The advantage to this survey was that there were a large number of observations across different regions of the United States as well as data on high schools and student performance. The study conducted a survey in the base year of 1980 and followed up with three more surveys in 1982, 1984, and 1986. The key variable of participating in a high school varsity sport was found in the base year survey. Related to high school athletic participation was a variable indicating a leadership role on the varsity team. This was included to examine if leaders gained more than their teammates. In examining the effects of high school athletic participation, many additional variables had been noted as important factors in past literature. These variables included race, gender, socioeconomic background, high school characteristics, academic ability, self-perception variables, and college expectation variables, all of which were found in the base year survey as well. Table 1 gives mean values of characteristics of athletes and non-athletes separated by gender. There was a

larger percentage of black athletes in both gender categories with 25.6% and 24.9% of male and female athletes who were black, respectively, compared to 21.9% and 17.8% of male and female non-athletes. Athletes had higher high school grade point averages that non-athletes. Athletes also had higher percentages of fathers who graduated from college and parental collegiate expectations than their non-athletic counterparts. Athletes, themselves, also had higher collegiate expectations than non-athletes. 58.2% of male athletes expected to go to college, while 41.9% of male non-athletes expected to go to college. Family income was hard to gauge, however, because in the survey it was reported in ranges, rather than actual income. However, there was not a large difference between the income ranges between male and non-male athletes and only a small difference between female athletes and non-athletes.

In terms of the follow-up surveys, data was not used from 1982; however, data from the 1984 and 1986 follow-ups gave information on college attendance, college graduation, wage, occupation, industry, employment arrangement, and employment status. Information on both college attendance and graduation were found in the 1984 and 1986 surveys. Again, athletes of both genders were more likely to attend college and graduate than non-athletes of the same gender. 33.7% of male athletes and 34.6% of female athletes attended college while only 21.9% of male and 25.6% of female non-athletes attended college. It should be mentioned that there are also a large number of black and Hispanic athletes in this sample. However, this was due to the general over-sampling of minorities in the survey as compared to the population as a whole. This sample consisted of 45.2% white respondents, 24.5% black respondents, and 24.3% Hispanic respondents. However, according to the U.S. Census data from 1980 and 1990, the true racial demographics in the U.S. consisted of 79.85% and 75.64% white in 1980

and 1990 respectively, 11.52% and 11.75% black in 1980 and 1990, and 6.45% of Hispanics in 1980 and 8.99% of Hispanics in 1990. Therefore, this survey was not representative of the population. However, it still gave us insight into the different affects athletics has on educational and labor market outcomes.

Labor market outcomes were determined by the wages earned in 1984 and 1986. The 1984 wage variable was used to look at how athletic participation affected those students who did not attend college. On the other hand, the 1986 wage variables encompassed the total sample of students. However, in neither survey was there a direct wage variable. Therefore, I generated the wage variables using the reported salaries of the respondents in both follow-ups and divided them by the reported hourly earnings based on their reported wage schedule. For example, if a respondent reported a salary based on a monthly wage schedule, I generated his wage by dividing his salary by (4*hours worked a week). In 1984, being an athlete does not have a significant effect on wages. In 1986, however, male athletes earn higher wages than male non-athletes significant at the one percent level and female athletes earn more than non-athletes significant at the ten percent level. Finally, because the human capital theory suggests the log-linear regression is ideal for wage analysis, I took the log of the wages to create the dependent variables for my wage regressions.

**Table 1: Characteristics of athletes separated by gender**

*** &** & * denote significance levels at the 1%, 5%, and 10% respectively comparing the mean for athletes to the mean for non-athletes

| | Male Athletes | Male Non-Athletes | Female Athletes | Female Non-Athletes |
|---|---|---|---|---|
| % Who go to college | 33.7% *** | 21.9% | 34.6% *** | 25.6% |
| % Who graduate from college | 25.6%*** | 16.3% | 24.9%*** | 17.8% |
| % Black | 26.48% *** | 21.58% | 26.46% | 25.49% |
| % Hispanic | 30.1% | 32.1% | 24.5% *** | 31.5% |
| Family income: <$7000 | 2.2%*** | 2.4% | 1.2%*** | 5.1% |
| $7000-$11000 | 2.8% | 3.4% | 1.7% | 6.5% |
| $12,000-$15,999 | 3.2% | 4.3% | 1.8% | 6.4% |
| $16,000-$19,999 | 3.2% | 3.8% | 1.8% | 6.2% |
| $20,000-$24,999 | 3.6% | 3.8% | 1.8% | 5.5% |
| $25,000-$37,999 | 3.8% | 3.5% | 2.0% | 5.3% |
| >$38,000 | 3.7% | 3.3% | 1.9% | 4.1% |
| % Of father's who graduated from college | 20.8% *** | 15.0% | 19.3% *** | 12.8% |
| Average high school GPA | 3.4 *** | 3.7 | 2.9 *** | 3.2 |
| % Expected to go to college | 58.2% *** | 41.9% | 60.1% *** | 45.8% |
| % Of fathers who expected their child to go to college | 62.5% *** | 49.7% | 67.3% *** | 58.9% |
| % Of mothers who expected their child to go to college | 73.1% *** | 59.0% | 79.5% *** | 70.8% |
| Average wage in 1984 | $5.85/hr | $5.92/hr | $5.08/hr | $5.22/hr |
| Average wage in 1986 | $7.15/hr *** | $5.29/hr | $7.09/hr * | $5.85/hr |

## IV. Analysis

A) College Attendance and College Graduation Equations

In order to examine the relationship between high school athletic participation and college attendance, I used a Probit model to estimate the regression:

$$\text{College}_i = \beta_0 + \beta_1(\text{HSathlete})_i + \beta_2(\text{sex})_i + \beta_3(\text{black})_i + \beta_4(\text{Hispanic})_i + \beta_5(\text{HSathlete*sex})_i + \beta_6(\text{HSathlete*black})_i + \beta_7(\text{HSathlete*Hispanic})_i + \beta_8(\text{high school characteristics})_i + \beta_9(\text{parental income})_i + \beta_{10}(\text{parental education})_i + \beta_{11}(\text{parental expectations})_i + \beta_{12}(\text{student expectations})_i + \beta_{13}(\text{standardized test scores})_i + \beta_{14}(\text{HSGPA})_i + \beta_{15}(\text{self-esteem})_i + \beta_{16}(\text{popular})_i + \varepsilon_i \quad (1)$$

The college attendance variable was a dummy variable generated by obtaining information on whether a respondent attended any four-year college. The independent variable, high school athlete, was also a dummy indicating whether one participated in varsity high school athletics. Race was broken up into two dummies, black and Hispanic. Hispanic was equal to one for all Hispanics and zero otherwise. The race and gender variables as well as their interactions with high school athletic participation were included to investigate if athletic participation affected those of various races and gender differently. The controls used in this equation were variables that were found to affect athletic participation in previous literature and were therefore incorporated so that I could observe high school athletic participation's independent effect on college attendance. Preceding studies found that athletes tend to come from more affluent backgrounds, therefore I controlled for socioeconomic background by including family income and parental education. Because high school characteristics could be correlated with socioeconomic background, high school region and urbanization were also added as

controls. Other literature found that academic performance as well as personal educational expectations and parental expectations affected college attendance as well as athletic participation. Therefore, high school grades and standardized test scores were included to control for ability. High school grades were listed as ranges in the data set with one equal to a high grade point average and eight equal to a low grade point average. Also, three separate dummy variables were included to control for mother's educational expectations, father's expectations, and student expectations. Finally, self-esteem and popularity were added to control for self-perception because of Coleman's conclusion that higher self-esteem and popularity were associated with higher rates of athletic participation in high school. The results of this initial regression can be seen in Table 2.

The same controls that were taken into account in the college attendance regression were also included in the college graduation equation since many of the same factors influenced these two variables. In addition to these controls, a dummy stating whether one was a collegiate athlete or not was added as another independent variable to the college graduation regression. This was incorporated to see whether playing a sport in college positively affected the probability of graduating from college. Similar to the high school athlete, interaction terms between the college athlete, race, and gender were inserted for comparison to determine if there were differing effects of college athletics on the probability of graduating based on race or gender. College graduation was a dummy based on whether those who attended college graduated by the time of the 1986 survey and was estimated using a Probit model.

$$\text{CollegeGrad}_i = \beta_0 + \beta_1(\text{HSathlete})_i + \beta_2(\text{collegeathlete}) + \beta_3(\text{sex})_i + \beta_4(\text{black})_i + \beta_5(\text{Hispanic})_i + \beta_6(\text{HSathlete*sex})_i + \beta_7(\text{HSathlete*black})_i + \beta_8(\text{HSathlete*Hispanic})_i + \beta_9(\text{college athlete*sex})_i + \beta_{10}(\text{college athlete*black})_i +$$

$\beta_{11}$ (college athlete*Hispanic)i + $\beta_{12}$(high school characteristics)$_i$ + $\beta_{13}$(parental income)$_i$ + $\beta_{14}$(parental education)$_i$ + $\beta_{15}$(parental expectations)$_i$ + $\beta_{16}$(student expectations)$_i$ + $\beta_{17}$(standardized test scores)$_i$ + $\beta_{18}$(HSGPA)$_i$ + $\beta_{15}$(self-esteem)$_i$ + $\beta_{16}$(popular)$_i$ + $\varepsilon_i$ (2)

These results can be seen in Table 3 and 4. Table 3 presents the findings of high school athletic participation as the only independent variable on the probability of graduating while Table 4 presents results of the effects of both high school and collegiate athletic participation.

B) Wage Equations

In order to estimate the wages of various groups in the sample, I ran two linear regression models with the log of hourly earnings as the dependent variable in order to see the effect of participating in high school athletics, looking at the sample of seniors from my data set. To control for causal effects that may affect wages, I used variables for socioeconomic background (parental income and education), high school characteristics (urbanity, region) high school performance (high school grades, standardized test scores), occupation, industry, employment arrangement, employment status, and education level to see the independent effect of high school athletic participation on wages in both wage equations. Education level was initially measured through HSgraduate, a dummy controlling for whether the respondent graduated from high school or not.

Ln(1984wages)$_i$ = $\beta_0$ + $\beta_1$(HSathlete)$_i$ + $\beta_2$(sex)$_i$ + $\beta_3$(black)$_i$ + $\beta_4$(Hispanic)$_i$ + $\beta_5$(part-time dummy)$_i$ + $\beta_6$(occupational dummies)$_i$ + $\beta_7$(employment arrangement)$_i$ + $\beta_8$(industry dummies)$_i$ + $\beta_9$(sex*HSathlete)$_i$ + $\beta_{10}$(black*HSathlete)$_i$ + $\beta_{11}$(Hispanic*athlete)$_i$ + $\beta_{12}$(high school characteristics)$_i$ +

$\beta_{13}$(parental income)$_i$ + $\beta_{14}$(parental education)$_i$ + $\beta_{15}$(high school performance)$_i$ + $\beta_{16}$(HS graduate)$_i$ + $\varepsilon_i$ (3)

The 1984 wage equation looked at the effect of high school athletic participation on wages for those who did not attend college. The high school athlete dummy and the interaction terms were the variables of concern to obtain information on the effects of high school athletic participation on wages for those who did not graduate from college. These results can be seen in Table 5. The 1986 wage equation was used to see how high school athletic participation affected the wages of the total sample of students.

Ln(1986wages)$_i$ = $\beta_0$ + $\beta_1$(HSathlete)$_i$ + $\beta_2$(collegeathlete)$_i$ + $\beta_3$(sex)$_i$ + $\beta_4$(black)$_i$ + $\beta_5$(Hispanic)$_i$ + $\beta_5$(part-time dummy)$_i$ + $\beta_6$(occupational dummies)$_i$ + $\beta_7$(employment arrangement)$_i$ + $\beta_8$(industry dummies)$_i$ + $\beta_9$(HSathlete*sex)$_i$ + $\beta_{10}$(HSathlete*black)$_i$ + $\beta_{11}$(Hispanic*HSathlete)$_i$ + $\beta_{12}$(collegeathlete*sex)$_i$ + $\beta_{13}$(collegeathlete*black)$_i$ + $\beta_{14}$(collegeathlete*Hispanic)$_i$ + $\beta_{15}$(high school characteristics)$_i$ + $\beta_{16}$(parental income)$_i$ + $\beta_{17}$(parental education)$_i$ + $\beta_{18}$(high school performance)$_i$ + $\beta_{19}$(HS graduate)$_i$ + $\beta_{20}$(attended college)$_i$ + $\beta_{21}$(graduated from college)$_i$ + $\varepsilon_i$ (4)

The additional variables in the 1986 wage equation were the college attendance dummy and the college graduate dummy. The college athlete dummy was also put in to determine if there were differing effects of participating in high school and college athletics. Again, interaction terms between the college athlete, race, and gender were inserted for comparison to determine if there were differing effects of college athletics on wages based on race or gender. The results of this equation are shown in Table 6, 7, 8, and 9. Table 6 displays the results of the 1986 wage regression with high school athletic

participation as the only independent variable denoting athletic participation and Table 7 exhibits the results of both high school and college athletic participation's effect on 1986 wages. Table 8 shows the effect of high school athletic participation on those who attended college. Finally, Table 9 looks at the effect of being a high school varsity athlete on wages in 1986 for those who did not attend college. It is important to not that the dummy variable denoting a leadership role on a high school varsity sports team was included in all the previous regressions. However, in no case was it significant. Therefore it is not shown in the following tables, but the results can be found in the Appendix.

Based on the above information, I lastly wanted to determine how different levels of play specifically affected wages. Therefore, I generated variables to denote those who only played sports in high school, those who only played in college, and those who played in both settings as well as interactions for each of these variables. Using these each as independent variables, I regressed only high school athletes, only college athletes, and both on 1986 wages using the same controls as the other wage equations. The results of this regression are illustrated in Table 10.

**V. Results**

The results of athletic participation on college attendance in Table 2 support earlier studies illustrating a positive relationship between high school athletic involvement and academic success. Based on these models, athletics seem to enhance academia. In models 1 through 6, high school varsity athletic participation positively and significantly affects college attendance at the one percent level. In models 1 and 2, no controls are added. Controlling for socioeconomic status, being an athlete increases the probability of going to college by about 12 percentage points for men and 8 percentage

points for women. When the high school controls are included, the magnitude of the probability of a high athlete attending college decreases to 10.6 percentage points and to 4.6 percentage points for women. This provides evidence that athletes may be more driven than non-athletes and may signal their industriousness and diligence by participating in a varsity sport. With the addition of self-perception controls in model 6, however, there no longer seems to be a differential between male and female athletes. In model 7, the estimate on being a high school athlete is not significant with the addition of educational expectation controls; yet, the positive coefficient is consistent with the idea that athletics encourages college attendance.

The educational expectation controls include parental expectations, peer expectations, as well as student self-reported expectations. The insignificance of high school athletic participation could come from parental expectations because parental encouragement has been positively linked to college attendance. However, it could also come from the self-reported student expectations. The survey was taken of seniors who most likely have already made the decision of whether they would be going to college or not. Therefore, by this time, their expectations are already set. To test whether it was parental or self-expectations that led to the insignificance, I ran separate regressions for self and parental expectations on college attendance. When self-expectations were included without parental expectations, high school athletic participation remained significant with a p-value of 0.024. However, when parental expectations were included instead of self-expectations, high school athletic participation became insignificant with a p-value of 0.112. Therefore, parental expectations have the ability to cancel the effect of being an athlete on the probability of attending college since parental encouragement as well as expectations have been shown to affect students' athletic participation which

affects the probability of going to college. Also, because athletics has been known to produce a set of skills, they could influence expectations by allowing the athlete to feel more prepared for college. Consequently, expectations lead to an insignificant effect of high school athletic participation. Another concern arises when accounting for confidence with the self-perception controls. There could be two-way causation with confidence and athletic participation. Is it that those who choose to participate in athletics are inherently confident or is it the act of participating in athletics that helps individuals build confidence?

Returning to Table 2, the effect of athletics on college attendance is the same for blacks and whites as can be seen through the lack of significance of the Athlete*Black interaction. However, being an athlete has less of an effect on the probability of going to college for Hispanics than for whites. This could be due to the fact that white, male athletes have more opportunities to play their sport in college or that Latino athletes turn to other alternatives, such as working or trade school, instead of going to collegeIn general, however, athletics has a positive effect on the probability of attending college, especially for white and black males.

**Table 2: Probit regression using college attendance as the dependent variable and high school athlete as the independent variable**

- P-values are in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| High School Varsity Athlete | .0984 (0.000) | .1537 (0.000) | .1179 (0.000) | .1029 (0.000) | .1066 (0.000) | .0553 (0.004) | .0226 (0.230) |
| Athlete*Sex | -- | -.0418 (0.020) | -.0381 (0.056) | -.0579 (0.006) | -.0602 (0.004) | -.0450 (0.038) | -.0314 (0.141) |
| Athlete*Black | -- | -.0300 (0.158) | -.0074 (0.761) | -.0272 (0.318) | .0244 (0.370) | .0325 (0.255) | .0441 (0.121) |
| Athlete*Hispanic | -- | -.0724 (0.000) | -.0611 (0.007) | -.0601 (0.013) | -.0566 (0.020) | -.0558 (0.025) | -.0404 (0.099) |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Performance Controls | No | No | No | Yes | Yes | Yes | Yes |
| High School Characteristic Controls | No | No | No | No | Yes | Yes | Yes |
| Self-perception Controls | No | No | No | No | No | Yes | Yes |
| Educational Expectation Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0092 | .0228 | .0740 | 0.2281 | .2375 | .3139 | .3655 |
| N | 10,926 | 10,926 | 9,306 | 8,268 | 8,268 | 7,827 | 7,581 |

Because of the drop in observations seen in models 6 and 7, I re-ran columns 1 and 2 with the same number of observations in column 7 and found that the high school athlete coefficients were unchanged. Therefore, the 3,400 lost observations are not driving the relationship.

The results of the college graduation regression, however, are not consistent with literature that found a positive relationship between athletics and academic success, determined in this case by graduating from college. When looking at the high school

athlete in Table 3, it is insignificant in all the models, with a negative coefficient in four of the seven models. It could be due to the intrinsic values gained as an athlete that helps them get into college; yet, once in, the former athletes may not have a motivation different from non-athletes to excel when in an academically competitive environment rather than a physically competitive environment. In these regressions, being a black or female athlete has no significant effect on the probability of graduating from college. Being a Hispanic athlete, also, is insignificant in the models. It is the only interaction, however, with negative coefficients in all the models. Perhaps Latino athletes do not perform as well in college as other athletes. Because of the insignificance of the interaction terms, I re-ran this Probit regression without them to determine whether the interactions were taking away from the full effect of being a high school athlete. However, the new regression resulted in little change in the estimate.

When looking at the effect of both high school and collegiate athletic participation on college graduation in Table 4, the coefficients on high school athlete are similar to the previous regression in Table 3. The coefficients on college athlete are significantly positive at the ten percent level in models 1 through 3. Yet, the coefficients become insignificant once socioeconomic and high school variables are controlled for. The positive direction, however, indicates that collegiate athletes potentially have the capabilities to have a higher probability of graduating from college. Assuming many college athletes are former high school athletes, the collegiate athletes continue to take on the positive effects that high school athletics produces because they are still in a team-oriented environment. Once in college, it is those who did not continue their athletic aspirations who are less likely to graduate. This could be because they lose some sense of self and belonging and do not feel as comfortable in the college atmosphere as they did

in high school. When the college athlete variable is added, neither gender nor race is a factor for high school athletes but being a black college athlete appears significant in models 2 and 3 with a negative coefficient. However, once socioeconomic factors are controlled for, race becomes an insignificant factor for collegiate athletes as well. Hence, there is essentially no effect on graduating from college for any type of athlete once socioeconomic and high school controls are included into the regression.

**Table 3: Probit regression using college graduation as the dependent variable and high school athlete as the independent variable**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Athlete | .0250 (0.120) | -.0005 (0.987) | -.0067 (0.829) | .0075 (0.815) | .0086 (0.789) | -.0119 (0.719) | -.0159 (0.635) |
| Athlete*Sex | | .0231 (0.496) | .0275 (0.442) | .0236 (0.532) | .0225 (0.551) | .0335 (0.377) | .0339 (0.375) |
| High School Varsity Athlete | .0070 (0.705) | -.0022 (0.946) | -.0043 (0.902) | .0113 (0.752) | .0157 (0.664) | -.0057 (0.876) | -.0112 (0.764) |
| Athlete*Black | -- | .0356 (0.358) | .037 (0.422) | .0164 (0.715) | .0177 (0.694) | .0224 (0.619) | .0222 (0.627) |
| Athlete*Sex | | .0071 (0.852) | .0089 (0.826) | .0098 (0.816) | .0069 (0.870) | .0238 (0.568) | .0264 (0.536) |
| Athlete*Hispanic | -- | -.0385 (0.364) | -.0483 (0.281) | -.0688 (0.156) | -.0699 (0.151) | -.0684 (0.168) | -.0462 (0.350) |
| Athlete*Black | -- | .0534 (0.225) | .0469 (0.332) | .0145 (0.782) | .0173 (0.741) | .0238 (0.650) | .0197 (0.711) |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| Athlete*Hispanic | -- | -.0578 (0.235) | -.0632 (0.219) | -.0673 (0.218) | -.0712 (0.195) | -.0707 (0.205) | -.0379 (0.492) |
| High School Performance Controls | No | No | No | Yes | Yes | Yes | Yes |
| High School Characteristic Controls | No | No | No | No | Yes | Yes | Yes |
| Self-perception Controls | No | No | No | No | No | Yes | Yes |
| Educational Expectation Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0007 | .0265 | .0728 | 0.2209 | .2288 | .2827 | .3265 |
| N | 2,879 | 2,879 | 9,219 | 8,197 | 8,197 | 7,761 | 7,516 |

**Table 4: Probit regression using college graduation as the dependent variable and high school and college athlete as the independent variables**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| College Athlete | .0430 (0.020) | .0550 (0.090) | .0567 (0.096) | .0473 (0.183) | .0450 (0.207) | .0422 (0.242) | .0473 (0.193) |
| College Athlete*Sex | -- | -.0015 (0.968) | -.0117 (0.771) | -.0095 (0.820) | -.0051 (0.903) | -.0172 (0.568) | -.0207 (0.536) |
| College Athlete*Black | -- | -.0976 (0.050) | -.1021 (0.062) | -.0552 (0.322) | -.0595 (0.288) | -.0506 (0.526) | -.0482 (0.394) |
| College Athlete*Hispanic | -- | .0115 (0.807) | -.0273 (0.587) | -.0376 (0.478) | -.0362 (0.496) | -.0343 (0.205) | -.0543 (0.326) |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Performance Controls | No | No | No | Yes | Yes | Yes | Yes |
| High School Characteristic Controls | No | No | No | No | Yes | Yes | Yes |
| Self-perception Controls | No | No | No | No | No | Yes | Yes |
| Educational Expectation Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0025 | .0145 | .0160 | .0315 | .0330 | .0393 | .0440 |
| N | 2,583 | 2,583 | 2,300 | 2,104 | 2,104 | 2,046 | 2,014 |

- P-values in parentheses

The results reported in Table 5 show that high school athletics has a positive but insignificant effect on wages in 1984 for those who did not attend college. Although significant in model 1 at the five percent level with no interactions or controls, further results show no significance. The interaction terms as well were insignificant showing that without a college education, athletics has no effect on wages in 1984. Even after removing the interactions from the regression, being a high school varsity athlete has insignificant effects on wages in 1984. If one does not attend college and opts to work instead, the jobs they are entering probably do not yet value the skills gained through

athletics as much as jobs one would get after college. Because college attendance and graduation are signals of productivity to future employers, it may take longer for employers of high school graduates to see the true values, skills, and productivity of those who played sports in high school. Therefore, I look further into the wages of those who did not attend college in 1986. The results of this regression can be seen in Table 9 and will be discussed later.

**Table 5: Wage equation using the log of 1984 wages as the dependent variable and high school athlete as the independent variable**

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| High School Varsity Athlete | .0251 (0.052) | .0289 (0.203) | .0233 (0.333) | .0230 (0.387) | .0251 (0.344) | .0219 (0.404) | .0201 (0.444) |
| Athlete*Sex | -- | -.0240 (0.367) | -.0240 (0.403) | -.0434 (0.171) | -.0419 (0.186) | -.0333 (0.289) | -.0297 (0.343) |
| Athlete*Black | -- | -.0529 (0.108) | -.0605 (0.095) | -.0378 (0.364) | -.0371 (0.371) | -.0271 (0.508) | -.0224 (0.584) |
| Athlete*Hispanic | -- | -.0371 (0.209) | -.0392 (0.214) | -.0159 (0.649) | -.0123 (0.723) | -.0011 (0.974) | -.0029 (0.932) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Performance Controls | No | No | No | Yes | Yes | Yes | Yes |
| High School Characteristic Controls | No | No | No | No | Yes | Yes | Yes |
| Occupation and Industry Controls | No | No | No | No | No | Yes | Yes |
| Employment Arrangement Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0007 | .0268 | .0322 | .0337 | .0429 | .0886 | .0939 |
| N | 5,666 | 5,666 | 4,820 | 3,934 | 3,934 | 3,808 | 3,808 |

The 1986 wage regression results can be seen in Tables 6, 7, 8, 9, and 10. Table 6 shows the results of high school athletic participation's effect on wages in 1986. The wages in 1986 are significantly affected by high school athletic participation at the ten percent level when all the controls are combined. With no controls, being a high school athlete results in a 10% increase in wages relative to non-athletes. Controlling for socioeconomic status, the effect decreases to a relative increase of wages to 6.7%, significant at the one percent level. When high school controls are added, the estimate again decreases and athletes earn 5.8% more than non-athletes, still significant at the one percent level. However after this decrease, the magnitude does not change much with the addition of the other controls. Once all socioeconomic, high school, college, occupation, industry, and employment controls have been included in the regression, high school athletes earn about 5.7% more than their non-athletic counterparts, significant at the ten percent level. This is consistent with the belief that athletic participation can act as a signal to employers of their human-capital. Athletics could be used as a training

mechanism for employment in terms of teamwork, time management, commitment, and other skills needed as additional human capital. The use of interaction terms between race and gender yield insignificant results suggesting that the effect of being an athlete on wages is similar across sex and race.[1] Because of the insignificance of the interactions in the original regression, removing them allowed the full effect of athletic participation to be seen on wages in 1986. This, however, did not change the magnitude or direction of any other variables included in the regression aside from high school varsity athlete. Unlike the previous regressions where the interaction removal had no effect on the independent variable, in this case, there is a clear relationship between being a high school varsity athlete and wages.

Table 7 presents the results of the 1986 wage regression with high school athletic participation and collegiate athletic participation as the independent variables. In model 1 with no controls, a high school athlete earns 9% more than a non-high school athlete. The magnitude decreases with the addition of controls. Once high school (urbanity, region, performance) and college (attended, graduated) variables are controlled for, high school athletes earn 5.7% more than non-athletes. With the inclusion of the college variables as well as the controls, high school athletic participation is positively significant at the one percent level while being a college athlete is highly insignificant. High school athletes earn 5.8% higher wages than non-athletes. All the interaction terms are insignificant as well in model 7 indicating again that the race and gender do not affect an athlete's financial success in the labor market. They were once again removed from the regressions so that the full effect of participating in high school athletics could be seen.

[1] When the interactions were insignificant in all models in the wage regressions, an F-test was run. In all cases (Tables 6, 7, 8, and 10), the F-test informed that one would not reject the hypothesis that the coefficients of the interactions were jointly equal to zero.

The control variable estimates basically remained unchanged. Interestingly, college athletic participation is not significant for male athletes, yet marginally significant for female athletes until the addition of occupation and industry controls. If high school athletic participation were seen as a signal to employers, one would expect that furthering their athletic pursuits in college would be a signal as well. However, this is not observed. Employers may see college attendance and graduating from college as better signals than playing a sport in college since after college, it is the academic knowledge learned in college that will most likely be used in the work place.

**Table 6: Wage equation using the log of 1986 wages as the dependent variable and high school athlete as the independent variable**

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| High School Varsity Athlete | .1024 (0.000) | .0841 (0.006) | .0674 (0.035) | .0584 (0.004) | .0565 (0.007) | .0552 (0.007) | .0565 (0.057) |
| Athlete*Sex | -- | -.0306 (0.398) | -- | -- | -- | -- | -- |
| Athlete*Black | -- | -.0084 (0.848) | -- | -- | -- | -- | -- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Athlete*Hispanic | -- | .0168<br>(0.684) | .<br>-- | -- | -- | -- | -- |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Controls | No | No | No | Yes | Yes | Yes | Yes |
| College Controls | No | No | No | No | Yes | Yes | Yes |
| Occupation and Industry Controls | No | No | No | No | No | Yes | Yes |
| Employment Arrangement Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0042 | .0155 | .0242 | .0432 | .0442 | .0944 | .0886 |
| N | 8,144 | 8,144 | 7,073 | 6,320 | 6,214 | 6,180 | 6,178 |

**Table 7: Wage equation using the log of 1986 wages as the dependent variable and high school and college athlete as the independent variables**

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| High School Varsity Athlete | .0899<br>(0.000) | .0675<br>(0.036) | .0469<br>(0.019) | .0563<br>(0.008) | .0571<br>(0.008) | .0568<br>(0.007) | .0580<br>(0.006) |
| Athlete*Sex | -- | -.0438<br>(0.249) | -- | -- | -- | -- | -- |
| Athlete*Race | -- | .0092<br>(0.844) | -- | -- | -- | -- | -- |
| Athlete*Hispanic | -- | .0419<br>(0.331) | -- | -- | -- | -- | -- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| College Athlete | .0981 (0.000) | .0870 (0.039) | .0634 (0.136) | .0076 (0.867) | -.0135 (0.788) | -.0054 (0.913) | .0020 (0.969) |
| College Athlete*Sex | -- | .0926 (0.081) | .0872 (0.105) | .0971 (0.082) | .0933 (0.101) | .0715 (0.204) | .0617 (0.272) |
| College Athlete*Black | -- | -.1073 (0.106) | -.0978 (0.152) | -.1209 (0.091) | -.1178 (0.107) | -.0884 (0.220) | -.0941 (0.191) |
| College Athlete*Hispanic | -- | -.0584 (0.406) | -.0621 (0.384) | -.0722 (0.341) | -.0792 (0.303) | -.0769 (0.308) | -.0821 (0.276) |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Controls | No | No | No | Yes | Yes | Yes | Yes |
| College Controls | No | No | No | No | Yes | Yes | Yes |
| Occupation and Industry Controls | No | No | No | No | No | Yes | Yes |
| Employment Arrangement Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0062 | .0178 | .0251 | .0486 | .0454 | .0941 | .0960 |
| N | 7,839 | 7,839 | 6,813 | 6,093 | 6,050 | 6,018 | 6,016 |

After determining that wages in 1986 are generally higher for high school athletes, I differentiate between those who attended college and those who did not. Table 8 reveals the effect of being a high school athlete on 1986 wages for those who attended college. Once again, the interactions were insignificant and were removed from the equation to reveal the full effect of being a high school athlete, regardless of race and gender. There is a significantly positive effect for high school athletes who attend college. In all seven models, the estimate is significant at least at the ten percent level. When controlling for socioeconomic status, high school athletes earn 6.3% more than

non-athletes at a ten percent significance level. When high school controls are also included, the magnitude actually increases to 7.2%; however, the estimate drops to 7.1% when the college variables of attending college and graduating from college are controlled for. When all the controls are added in model 7, the estimate is significant at the five percent level and shows that high school athletes earn 7% more than their non-athletic counterparts.

Table 9 looks at the wages in 1986 of those who did not attend college. Unlike the 1984 wage regression, being a high school athlete positively and significantly affects wages in 1986. In all models, the coefficients on high school varsity athlete are significantly different from zero at the five percent level. When socioeconomic status was taken into account, high school athletes earn 10.6% more than non-athletes. Once industry and occupation controls, as well as high school controls, were added, high school athletes are seen to earn 9.2% more than non-athletes. Maybe the significance in 1986 and not in 1984 derives from the experience factor. Once these athletes have been in the labor market, they have been able to prove their skills to employers who now know the true productivity of the athletes compared to non-athletes. In this regression, as well, the interaction between gender and athletics is significant. In models 2 through 7, female athletes who did not attend college, earn less than their male counterparts. Being a high school varsity athlete only benefits men, while female athletes earn similar wages to non-athletes. Since it is only men begin to take advantage of high school athletics six years after graduating, the networking theory may be supported if it takes men who do not attend college a longer amount of time to set up a network. However, race does not have a significant effect on the effect of athletics on wages in 1986 for those who did not attend college.

**Table 8: Wage equation using the log of 1986 wages as the dependent variable and high school athlete as the independent variable, regressed on those who attended college**

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| High School Varsity Athlete | .0823 (0.009) | .0084 (0.877) | .0627 (0.066) | .0724 (0.043) | .0706 (0.052) | .0605 (0.056) | .0701 (0.044) |
| Athlete*Sex | -- | .0971 (0.137) | -- | -- | -- | -- | -- |
| Athlete*Black | -- | .0347 (0.655) | -- | -- | -- | -- | -- |
| Athlete*Hispanic | -- | .0381 (0.640) | -- | -- | -- | -- | -- |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Controls | No | No | No | Yes | Yes | Yes | Yes |
| College Controls | No | No | No | No | Yes | Yes | Yes |
| Occupation and Industry Controls | No | No | No | No | No | Yes | Yes |
| Employment Arrangement Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0025 | .0101 | .0123 | .0292 | .0315 | .0863 | .0862 |
| N | 2,367 | 2,367 | 2,133 | 1,951 | 1,908 | 1,898 | 1,898 |

**Table 9: Wage equation using the log of 1986 wages as the dependent variable and high school athlete as the independent variable, regressed on those who did not attend college**

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| High School Varsity Athlete | .0999 (0.000) | .1100 (0.004) | .1062 (0.008) | .0999 (0.020) | .1041 (0.015) | .0917 (0.030) | .0923 (0.029) |
| Athlete*Sex | -- | -.1105 (0.013) | -.1144 (0.016) | -.1199 (0.020) | -.1147 (0.024) | -.1001 (0.047) | -.1012 (0.044) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Athlete*Black | -- | -.0270 (0.621) | -.0362 (0.543) | -.0052 (0.937) | -.0031 (0.962) | -.0054 (0.933) | -.0071 (0.912) |
| Athlete*Hispanic | -- | .0149 (0.764) | .0002 (0.997) | .0031 (0.957) | .0121 (0830) | .0237 (0.670) | .0233 (0.675) |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Performance Controls | No | No | No | Yes | Yes | Yes | Yes |
| High School Characteristics Controls | No | No | No | No | Yes | Yes | Yes |
| Occupation and Industry Controls | No | No | No | No | No | Yes | Yes |
| Employment Arrangement Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0036 | .0183 | .0273 | .0290 | .0445 | .0839 | .0834 |
| N | 5,679 | 5,679 | 4,864 | 4,306 | 4,306 | 4,282 | 4,281 |

The final regression results from the 1986 wages on those who attended college can be found in Table 10, which illustrates the wage effects of respondents who only participated in high school athletics, those who only participated in collegiate athletics, and those who participated in both. I also included their interactions to see if these different participation effects differed by sex or race. However, none of the interactions were significant. This was supported with an F-test that confirmed one would not reject the hypothesis that the coefficients were jointly equal to zero. Therefore, the regressions looking at only high school athletes, only collegiate athletes, as well as both high school and collegiate athletes as the independent variables were re-estimated without their interactions. Being only a collegiate athlete did not seem to affect wages with the coefficient being significant only in models 1 and 2 with no controls. However, being

only a high school athlete was significant in six out of the seven models in at least the ten percent level. When socioeconomic status was controlled for in model 3, only high school athletes earned 11.4% more than non-athletes at the five percent significance level. When high school controls were added, the magnitude increased to a 13.2% wage differential; however, with the addition of college controls the magnitude decreased down to 12.3%. The magnitude decreases once again with the introduction of occupation and industry controls to about 11% and levels out to 10.6% with the addition of employment arrangement controls, however the coefficients remain significant at the ten percent level. As can be seen from this table, there is a consistent impact of participating only in high school athletics and even a marginal effect for participating in both. With the effect of both being significant at the eleven percent level, it can be seen that the effect of participating in high school athletics is diminished from 10% to 7%, possibly because the college athlete does not benefit as much from college as the high school athlete who does not participate in college. Once socioeconomic and high school controls are used in model 4, the coefficient and the significance level of both do not change a great deal in the following models.

On the other hand, there was not a significant effect for those who only participated in collegiate sports. These results substantiate the belief that inherent values acquired from participating in high school athletics are valued in the labor market and lead to higher wages compared to non-athletes. Collegiate athletic participation, on the other hand, does not seem to enhance labor market outcomes. The insignificance of the only college athlete estimate shows that only college athletes may have missed out on the important lessons and values gained from high school athletics. Collegiate athletes also

have less time to spend on their academics relative to those who do not participate in a collegiate sport.

**Table 10: Wage equation using the log of 1986 wages as the dependent variable regressed on respondents who attended college and only played high school sports, only college sports, and both as the independent variables**

- P-values in parentheses

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Only H.S. Athlete | .1615<br>(0.001) | .0243<br>(0.789) | .1143<br>(0.034) | .1319<br>(0.020) | .1225<br>(0.033) | .1099<br>(0.049) | .1061<br>(0.055) |
| Only H.S. Athlete*Sex | -- | .1376<br>(0.188) | -- | -- | -- | -- | -- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Only H.S. Athlete*Black | -- | .0854 (0.499) | -- | -- | -- | -- | -- |
| Only H.S. Athlete*Hispanic | -- | .1893 (0.135) | -- | -- | -- | -- | -- |
| Only College Athlete | .0851 (0.070) | .1799 (0.031) | .0607 (0.220) | .0603 (0.228) | .0954 (0.243) | .0376 (0.450) | .0322 (0.514) |
| Only College Athlete*Sex | -- | -.0897 (0.355) | -- | -- | -- | -- | -- |
| Only College Athlete*Black | -- | -.1989 (0.110) | -- | -- | -- | -- | -- |
| Only College Athlete*Hispanic | -- | -.1180 (0.336) | -- | -- | -- | -- | -- |
| Both Athletes | .0814 (0.038) | .0789 (0.256) | .0618 (0.146) | .0703 (0.112) | .0717 (0.110) | .0693 (0.114) | .0686 (0.115) |
| Both. Athlete*Sex | -- | .0789 (0.256) | -- | -- | -- | -- | -- |
| Both*Black | -- | -.0682 (0.481) | -- | -- | -- | -- | -- |
| Both*Hispanic | -- | -.0599 (0.564) | -- | -- | -- | -- | -- |
| Socioeconomic Controls | No | No | Yes | Yes | Yes | Yes | Yes |
| High School Controls | No | No | No | Yes | Yes | Yes | Yes |
| College Controls | No | No | No | No | Yes | Yes | Yes |
| Occupation and Industry Controls | No | No | No | No | No | Yes | Yes |
| Employment Arrangement Controls | No | No | No | No | No | No | Yes |
| $R^2$ | .0055 | .0182 | .0172 | .0429 | .0459 | .1095 | .1161 |
| N | 2,154 | 2,154 | 1,944 | 1,782 | 1,744 | 1,740 | 1,739 |

## VI. Conclusion

The purpose of this study was to determine whether athletic participation affects educational attainment and labor market outcomes, determined by wages. Coordinated with previous findings, high school athletic participation had positive effects on college attendance with a 10 percentage point effect for white and black men and a 5 percentage

point effect for women. The difference in college attendance between male and female athletes could be due to differences in recruiting for collegiate athletics. There are more opportunities for male athletes to participate in collegiate athletics and they have, therefore, more of an incentive to attend college compared to their non-athletic counterparts. Also, women, in general, have a higher rate of attending college than men. Therefore female athletes may not see such a difference in attendance rates since females already have a higher probability of going to college.

College graduation, on the other hand, was not considerably affected by high school athletic activity; however, collegiate athletes benefited somewhat from their participation. In early models, collegiate student athletes graduated at a somewhat higher rate than students in the general population. According to Tinto (1975), athletes develop different levels of integration within an institution's social system by establishing different levels of interaction with peers and with faculty and staff in the academic community. According to his model, it seems that the graduation rate for students identified as collegiate athletes might be higher than the rate for other students because athletes have relatively high levels of social interaction and integration due to their constant contact with teammates, other athletes, coaches, and faculty. This along with other non-cognitive skills such as motivation and drive could increase an athlete's probability of graduating compared to non-athletes. However, this conclusion is drawn with caution due to the insignificance in models containing more controls.

The next step of the analysis focused on high school athletic participation's effect on wages in 1986. For those who did not go to college, high school athletic participation positively and significantly affected male wages. Male athletes earn more than 10% more than non-athletes. However, there was no effect seen for women. Male athletes

tend to have more of a social network due to alumnae who are working in the labor market. Females, on the other hand, usually do not have those types of contacts since many female alumnae may not be actively participating in the labor market. Hence, these results could be due to a network that male athletes built after high school or due to differences in the kinds of jobs that men and women go into without a college degree. For those who attended college, on the other hand, those who only participated in high school athletics as well as those who were athletes in high school and college saw positive effects on their wages. Those who only played high school sports had an 11% wage differential compared to non-athletes. Those who participated in both levels of athletics saw a 7% increase in wages compared to non-athletes. Collegiate athletic participation, however, did not significantly affect wages. There were also no differences between men, women and those of different races for those who attended college. Hence, these results diverge from the networking explanation. However, because there are no differences among genders and race, these results are consistent with the theory that athletics is a source of valued qualities. Firms value the characteristics that athletes, in general, acquire through their high school athletic participation.

These findings are supported by Gary Becker's allocation of time model where a student has a choice between school and leisure activities. Based on the simple model of two endeavors, introducing additional activities into the model allows time to be split between school, beneficial, and harmful leisure activities. Because of this split in time on different leisure activities, time spent on sports does not necessarily reduce the time allocated to schooling but rather can also reduce bad leisure activities, which might impair focus on educational pursuits. Playing sports could enhance skills needed for the classroom and the labor market while taking youth away from harmful leisure activities

such as watching television and playing video games. Athletics not only train motor skills such as eye-hand coordination and agility, but they also teach non-cognitive skills such as respect, teamwork and, leadership. Athletics additionally help in the formation of character of young people because they develop behavioral traits such as motivation, discipline, competitiveness, responsibility, perseverance, and confidence. These characteristics should lead to reduced truancy, increased willingness to succeed, and more social interaction with others, which can be associated with efficiency and productivity. Lastly, athletes are more likely to be in better health than non-athletes and their health status could increase productivity as well and lead to more investments in human capital. Healthier people will take less time off work due to sickness and will probably have a longer life span; hence, more commitment to a firm and continuity in the labor market.

Although there are generally positive results, the main concern with this study deals with self-selection bias. The large, representative national longitudinal data set, High School and Beyond, has only the most basic of data and measures on sport participation to draw from. It can be determined if a particular student was involved in athletics in some way, but this is a self-reported measure and it is not known what sport he played, what level he played at, how much time and energy was invested, and the school or community context in which sport is played. The lack of more informative data on sport participation is therefore problematic for establishing causal relationships and mechanisms. After controlling for socioeconomic status, a characteristic in which much of previous literature has correlated with athletics participation, high school athletic participation still had an effect for college attendance. It was parental expectations that ultimately triggered the insignificance of high school athletic participation. These

parental expectations can be correlated with athletics and college attendance in two different ways. They can affect a child's athletic participation and college attendance separately, where high school athletic participation is not directly correlated with college attendance. Parents may encourage their child to play sports while also encouraging them to go to college independently. In this case, it is the students who have high parental expectations and encouragement that play sports as well as excel in school who are more likely to attend college. On the other hand, a child's athletic participation could lead to higher parental expectations of college attendance. Parents may believe that their child is college worthy once they see that their child excels in athletics, especially if their child also experiences academic success. Therefore, it could be the child's athletic participation that affects parental expectations, which, in turn affects college attendance. However, there is no way to determine which mechanism is at work. Without better representation of the true population due to the over-sampling of minorities and pertinent measures of athletic participation, it is hard to understand all the mechanisms in which athletic participation produces positive labor market outcomes.

Therefore, future research in this area needs to look at a data set truly representing the U.S. population and develop and utilize a broader range of controls that examine the type of sport played, the profile of the athlete, the level of participation in college, and academic performance in college. When it comes to race, Eitle (2002) discovered that black boys are more likely to play football and basketball, the two sports that are less linked to academic achievement. On the other hand, white boys are more likely to play all other sports. However, no other research has looked into the effect of athletics specifically on other races. Latin American countries, historically, have strong soccer teams; therefore, Latinos could make up a considerable percentage of soccer players.

Conceivably, there could be differences in outcomes due to one's race and one's participation in a particular sport. Investigating the effects of different races on specific sports may bring insight as to why the differences exist in the classroom and in the labor market. If there is a significant variation in labor market outcomes for athletes in differing sports, future policy and educational programs could focus on aiding athletes involved in those sports. My findings indicate that those of Hispanic origin are less likely to be aided in the labor force by athletic participation than other athletes. It would be interesting to find if it is the type of sport played that brings this about or other reasons behind this result. The level and profile and participation of a collegiate athlete could have also affected graduation rates as well as wages. If an athlete is seen as high profile at a top ranking Division I school, he may not focus on academics and rather focus on his sport and maintaining his social status. This would lead to better labor market outcomes if he went into professional athletics or it could hurt his chances of graduating and obtaining a job after graduation. Division III athletes, on the other hand, are less likely to primarily concentrate on athletics and may pay more attention to academics, enhancing their human capital for future employment. Therefore, college GPA could be linked to collegiate athletic performance as well as labor market outcomes. Another factor that should be controlled for is encouragement received by influential adults. Rehberg (1968) found that encouragement positively affected athletes' level of educational attainment, which in turn affected their labor market outcomes. From this sample, however, I had no way of measuring encouragement from parents, teachers, and coaches. Therefore, an additional control for encouragement should be added to future analysis.

My analysis indicates that involvement in high school varsity athletics has beneficial effects on students in both the short and long run. Student athletes are more

likely to attend college and earn higher wages than non-athletes. Involvement in high school varsity athletics creates well-rounded individuals who gain non-cognitive skills that are valued in the work place and lead them to pursue higher achievements. In conclusion, participation in high school varsity athletics can be a major contributor to the acquisition of human capital, which aids in better educational and occupational outcomes.

## References


Barron, John M., Bradley T. Ewing, and Glen R. Waddell. "The Effects of High School Athletic Participation on Education and Labor Market Outcomes." *The Review of Economics and Statistics* 82.3 (2000): 409-21.

Becker, Gary S. "A Theory of the Allocation of Time." *The Economic Journal* 75.299 (1965): 493-517.

Coleman, James S. *The Adolescent Society*. New York: Free, 1961.

Eitle, Tamela M., and David J. Eitle. "Race, Cultural Capital and the Educational Effects of Participation in Sports." *Sociology of Education* 75.2 (2002): 123-46.

Ewing, Bradley T. "Athletes and Work." *Economics Letters* 59 (1998): 113-17.

Ewing, Bradley T. "The Labor Market Effects of High School Athletic Participation: Evidence from Wage and Fringe Benefit Differentials." *Journal of Sports Economics* 8 (2007): 255-65.

Fejgin, N. Participation in high school competitive sports: A subversion of school mission or contribution to academic goals? *Sociology of Sport Journal, 11*.3 (1994): 211- 230.

Hartmann, Douglas. “High School Sports Participation and Educational Attainment: Recognizing, Assessing, and Utilizing the Relationship.” University of Minnesota, 2008. LA84 Foundation, 2008.

Jable, James T. "Interscholastic Athletics." *Encyclopedia of Children and Childhood in History and Society*. Advameg Inc., 2008. Web. 4 Feb. 2010. <http://www.faqs.org/childhood/In-Ke/Interscholastic-Athletics.html>.

Long, James E., and Steven B. Caudill. "The Impact of Participation in Intercollegiate Athletics on Income and Graduation." *The Review of Economics and Statistics* 73.3 (1991): 525-31.

Piccou, Steven J., and Evans W. Curry. "Residence and the Athletic Participation-Educational Aspiration Hypothesis." *Social Science Quarterly* 55.3 (1974): 768-76.

Rehberg, Richard A., and Walter E. Schafer. "Participation in Interscholastic Athletics and College Expectations." *The American Journal of Sociology* 73.6 (1968): 732-40.

Snyder, Eldon E. "A Longitudinal Analysis of the Relationship between High School Student Values, Social Participation, and Educational-Occupational Achievement." *Sociology of Education* 42.3 (1969): 261-70.

Snyder, Eldon E., and Elmer Spreitzer. "Participation in Sport as Related to Educational Expectations among High School Girls." *Sociology of Education* 50.1 (1977): 47-55.

Spreitzer, Elmer, and Meredith Pugh. "Interscholastic Athletics an Educational Expectations." *Sociology of Education* 46.2 (1973): 171-80.

Stevenson, Betsey. *Beyond the Classroom: Using Title IX to Measure the Return to High School Sports*. Working paper. 2008.

Tinto, V. A. (1975). Dropout from higher education: A theoretical synthesis of recent research. Review of Education Research, 45, 89-125.

U.S. Dept. of Education, Center for Education Statistics. HIGH SCHOOL AND

BEYOND, 1980: SOPHOMORE AND SENIOR COHORT THIRD FOLLOW-UP (1986) [Computer file]. 2nd ICPSR release. Chicago, IL: National Opinion Research Center [producer], 1988. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 1993. doi:10.3886/ICPSR08896