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Does it Pay to be a High School Athlete?

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Abstract

Athletics are linked to increasing one's development of discipline, confidence, motivation, ability to work in groups, competitive spirit, ability to accept constructive criticism, and social networking. Past research has shown that participation in athletics during adolescence has proven to be beneficial to students in multiple areas of human capital development. This study aims to determine the impact of participation in high school athletics on the future income and educational attainment of student athletes.

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I. Introduction[1]

"Sports and other forms of vigorous physical activity provide educational experiences which cannot be duplicated in the classroom. They are an uncompromising laboratory in which we must think and act quickly and efficiently under pressure and then force us to meet our own inadequacies face-to-face and to do something about them, as nothing else does…Sports resemble life in capsule form and the participant quickly learns that his performance depends upon the development of strength, stamina, self-discipline and a sure and steady judgment."
–Supreme Court Justice Byron White

In the United States, nearly 7.2 million high school students participate in organized athletics each year, a number which has increased each of the last 17 years (NFHS, 2006). The popularity of men's and women's sports is growing every year, and new sports such as the X-Games are being created to fill the desires of the public. Even with athletic involvement at an all time high, there are many high schools across the nation that are faced with the decision to cut athletic programs due to lack of funds. In order for schools to keep one extracurricular activity, such as athletics, over another, such as band, there has to be evidence that the activity is beneficial to students later in life. Evidence may come in the form of future income, education beyond high school, or furthering one's ability to accumulate business-specific human capital. John Barron, Bradley Ewing and Glen Waddell (2000) use The National Longitudinal Survey of Youth (NLSY) to show that men at an average age of 32 who participated in high school athletics were paid 31 percent higher wages and graduated college at four percent higher rate than those who did not participate in high school athletics. This type of evidence is very influential in justifying athletics in high schools with below average funding.

My former high school football coach used to say that "If you can succeed in sports, you can succeed in life." A common perception held by many athletes is that athletics produces tangible outcomes such as income and educational attainment. They also believe that sports help an individual develop intangible character traits, such as teamwork and leadership skills. Howard Nixon, a well-respected expert on the sociology of sports, said it best when he claimed that Americans generally believe that high school athletics help white males to obtain corporate jobs and promotions, encourage poor black males to go to college, and foster a character development that in turn spawns achievement in life (Sabo, 1993). Athletics are linked to increasing one's development of discipline, confidence, motivation, ability to work in groups, competitive spirit, ability to accept constructive criticism, and social networking. Past research has shown that participation in athletics during adolescence has proven to be beneficial to students in multiple areas of human capital development. This study aims to determine the impact of participation in high school athletics on the future income and educational attainment of student athletes.

Section II of this paper explores the past literature that looks at the impact of athletic participation on future labor market outcomes. Section III presents the two most prominent theories in this area of research. Section IV explains the data and empirical model used in my analysis. Section V presents the results of my

1 *Brandin Heidbreder is a senior economics and risk management double major from Lincoln, Illinois. He wrote "Does it Pay to Be a High School Athlete?" for his Senior Project class.*

work. Lastly, Section VI presents conclusions, potential policy implications, and ideas for future research on this topic.

II. Review of Literature

The effect of high school athletic participation has been a topic that many researchers in economics and sociology have investigated. One of the first such studies was conducted by Luther Otto and Dwane Alwin (1977). These researchers look at follow up interviews conducted in 1972 on individuals who were initially interviewed in 1957. This study focuses on a small sample of high school students from one Michigan county. They discover a positive effect on income for high school athletes once they control for variables such as socio-economic status, mental ability, academic performance, and measures for aspiration.

Frank Howell, Andrew Miracle, and Roger Rees (1984) expand upon the research conducted by Otto and Alwin (1977). Their data sample is taken from the Youth in Transition Study. This data-set is a national sample of male youths who were first interviewed in 1966 as sophomores in high school. A follow up interview took place 5 years after the students graduated from high school. The authors limit their sample to those that did not move on to college and went directly into the work force after college. Howell, Miracle, and Rees (1984) are unsuccessful in finding a significant effect of athletic participation on income.

A study by James Long and Steven Caudill (1991) uses data from the Cooperative Institutional Research Survey (CIRP). The data were acquired by interviewing first-year college students first in 1971 and once again in 1980. This study looks not only at income, but also the effects collegiate athletics have on graduation rates. The Long and Caudill (1991) study uses similar variables as the previous studies plus a variable which identifies the region of the country in which the college is located. These region variables are used in hopes of eliminating any geographical advantages of particular students. Long and Caudill (1991) are able to say that males that participate in athletics earn significantly more on average, about four percent more on 1980 income, than those that do not. However, they are unable to say that women earn significantly more or less on average than women that do not participate in athletics.

The most recent study on the effects of college athletics and income was conducted by Shulman and Bowen in 2001. The study uses data that was collected from the College and Beyond dataset. This data comes from cohorts of college freshman interviewed in 1951, 1976, and 1989, as well as from follow-up interviews conducted approximately five years after the completion of a bachelor's degree and every five years thereafter. Through their analysis, they are able to determine that men who participated in athletics in all three cohorts earn more than the nonathletes. This effect was only analyzed for 1979 for women and it was discovered that women collegiate athletes earn more than their fellow students. This was the first analysis which showed a positive relationship between athletic participation for females of any sort.

Eric Eide and Nick Ronan (2001) look at the impact of high school athletics in 2001, ten years after students graduated from high school. This study uses data from a survey entitled High School and Beyond. Eide and Ronan (2001) find that male athletes, regardless of race, earn an income premium for participating in athletics. For females, the positive relationship is only present for whites.

James Curtis, William McTeer, and Phillip White (2003) examine data from the 1997 National Survey of Giving, Volunteering, and Participation (NSGVP). The survey was conducted in Canada via phone interviews focusing on how people ages 15 and older allocated their time. Curtis and his colleagues include the respondents age 25 and over who were currently working and not attending school.

They discover that on average males have an eight percent increase in wages and females have a four percent increase in wages with participation in athletics.

The studies addressed above all find that there is a correlation between athletic participation and labor market success for men entering the work force directly out of high school and after college. Very few are successful in determining the correlation between women and athletic participation at any level. None of the literature examined looks at the effect athletic participation has on individuals that went directly into the labor market compared to those that chose to attend college. Since it has been proven that athletic participation leads to greater educational attainment, it seems important to determine the effect of athletic participation on income for those that enter the work force directly out of high school or chose to attend college and compare the results. Such results will determine if athletics leads to more educational attainment, which in turn, leads to greater labor market success, or if athletics produces human capital characteristics desirable in the labor market.

III. Theoretical Structure

The allocation-of-time model proposed by Gary Becker is one way to analyze the effect that high school athletics has on income and educational attainment. Using this model, I assume that high school students have three ways to allocate their time: academics, athletics, and leisure. Students who choose to participate in athletics must be willing to devote a large amount of time to the sport. Time commitments include things such as practice, training, meetings, travel, games, and other forms of game preparations. This being the case, student-athletes would need to allocate less time to academic activities (homework, studying, and attending class) or leisure activities (sleeping, social interaction, and recreation) than non-athletes. If a student-athlete's grades are lower than non-athletes, then one can assume that students chose to take more time away from academic endeavors than leisure activities. This is supported by the fact that the NCAA has discovered that athletes have lower grades on average than non-athletes and has attempted to alleviate this problem by placing restrictions on the amount of time an athlete can be required to prepare for an upcoming event. Such a finding by the NCAA suggests that athletics reduce academic achievement and, in turn, lower labor market outcomes. However, examining the Cooperative Institutional Research Program (CIRP) reveals that men who participated in athletics received $3000 a year in higher wages than those who did not participate (Curtis, McTeer, and White, 2003). As a result, there has to be an additional theory beyond the allocation of time model to explain these results.

Human capital theory argues that individuals invest in their human capital to achieve greater labor market outcomes. Investing in human capital is not limited to schooling and job training, and high school athletes may be acquiring human capital traits which are unattainable by non-athletes and which help benefit them in the labor market. Athletics may help enhance self-control, confidence, discipline, ability to work in team settings in the workplace to achieve efficiency, social networking, and other subjective traits which may encourage success in the workplace (Long and Caudill, 1991). It has been suggested by Roger Rees and Hans Peter Brandl-Bredenbeck (cited in Curtis, McTeer, and White, 2003) that "body characteristics, for example physical appearance, clothing, eating and exercise habits, and physical ability in sport, have become increasingly important signs by which individuals interpret their sense of self to themselves and to others while helping establish their social status among their peers." Students are therefore able to increase their social, cultural, and physical capital by participating in athletics. This supports my hypothesis that participation in athletics during one's high school years allows an

individual to increase his or her human capital and, thus, earn higher incomes than non-athletes, *ceteris paribus*.

IV. Data/Empirical Model

The data for this model is from the National Longitudinal Survey of Youth 1979 (NLSY). The NLSY consists of information from 12,686 respondents who were interviewed initially in 1979 and then interviewed annually through 1994. From 1995 to 2002 (the most recent year available), the individuals are interviewed on a biennial basis. In 1979, the group of men and women ranged from ages 14-22, and today they would be 41-49. I will base most of my variables on the most recent year reported by the NLSY data, which is 2002, with the exception of whether or not a person participates in sports and other extracurricular activities or is a minority since those questions were not asked in the 2002 survey.

This study uses the highest grade completed and income as of 2002 as dependent variables. The income variable was calculated by using the variable for Wages and Salaries for the calendar year 2001 as reported in 2002. I want to look at the effects of athletics participation on those who are actively participating in the labor market. In order to make this possible, I restrict my dataset to those who worked 500 hours or more in 2002. I consider a person to be a significant participant in the labor market if he or she worked ten hours or more a week over the entire year. Since it is common for individuals to have two weeks a year for vacation, the minimum number of hours worked considered is calculated by taking ten hours a week times 50 working weeks a year. There may be a potential problem with using the Number of Hours Worked and Wages and Salaries variables. Since the hours and income for the year 2002 are the hours and income reported by the respondents on the survey, the reported hours and income could be inaccurate. Though this is a potential problem, I feel that the number of people giving accurate information in the NLSY surveys will outweigh the number of people reporting inaccurate information.

The key independent variable is a dichotomous variable that indicates whether the respondent was a very active participant in high school athletics. The technical detail on how this variable is constructed is described in Appendix A. Targeting the athletes who felt they were very active members would allow my research to look at individuals who would have benefited most from the potential human capital gains from athletic participation. This also helps eliminate the members of pep club that are included in this variable, which could skew my results, since I assume that pep club members are more likely to be most active in a different extracurricular activity. To create the new athletic participation variable, I made those that answered yes to athletic participation and those that answered to being very active members a 1 and all others 0. This totals to just over 2200 students as athletes, which is a sufficiently large sample group.

The explanatory variables for the income models include Highest Grade Completed and Sex of Respondent. Dummy variables are created for Sex of Respondent, where Male = 1 and Female = 0. The variable for education is taken straight from the NLSY data and is the actual number of years completed by 2002. I would like to have had a measure for the degree earned by individuals as opposed to years of schooling. Years of schooling could be misleading since at some colleges it takes more than 4 years to earn one's Bachelors degree and some individuals do not attend school full time and require more years of school to achieve a similar degree. This being said, the variable is still effective since it demonstrates the amount of time a person commits to increasing his or her human capital.

The explanatory variables of mother's education and one's racial status are taken from surveys in 1979 and 1980, respectively. Mother's education is used as a variable to control for socio-economic status. The question as to mother's education was only asked in 1979. A

dummy variable has to be created for the race variable. The dummy variable is created by making the individuals that report being Black or Other as 1 and those reporting being White as 0. The choice to use the responses to the 1980 survey as opposed to the 1979 survey was made because more respondents answered the 1980 survey.

I use five models in this study to show the effects of my explanatory variables on income for the total sample population (Model A), those who attended college (Model B), and those with no college education (Model C) of the NLSY data. Models will also be conducted for only men (Model D) and women (Model E). My final model (Model F) will determine the effect my explanatory variables have on the years of education one receives. By using income, I can determine the dollar change in income and calculate a percent differentiation from the mean income. Model B will only be run with information on respondents who attended post-secondary school after high school. Model C will be run on only respondents whose highest level of education was the 12th grade. Model F will run with the dependent variable of Highest Grade Completed and exclude the explanatory variable for level of education of the interviewee.

Model A: Entire Sample
INCOME = ß1 + ß2 ATHLETICS + ß3 MALE + ß4 MINORITY + ß5 EDUCATION + ß6 MEDUCATION + u

Model B: College Attendants
INCOME = ß1 + ß2 ATHLETICS + ß4 MALE + ß5 MINORITY + ß6 MEDUCATION + u

Model C: No College
INCOME = ß1 + ß2 ATHLETICS + ß3 MALE + ß4 MINORITY + ß5 MEDUCATION + u

Model D and E: Male and Female
INCOME = ß1 + ß2 ATHLETICS + ß3 MINORITY + ß4 EDUCATION + ß5 MEDUCATION + u

Model F: Entire Sample
EDUCATION = ß1 + ß2 ATHLETICS + ß3 MALE + ß4 MINORITY +ß5 MEDUCATION + u

Table 1 provides a list and description of all variables in the analysis.

Table 1: Variable Definitions

Variable	Definition	Hypothesized Sign
Dependent Variable		(Education)
INCOME	Total Wages and Salaries	
EDUCATION	Years of Education	
Explanatory Variables		
ATHLETICS	1 If Participated in Athletics 0 Otherwise	+ (+)
MALE	1 If Male; 0 If Female	+ (-)
MINORITY	1 If Minority; 0 If White	- (-)
MEDUCATION	Years of Education for Mother	+ (+)
EDUCATION	Years of Education for Interviewe	+ (+)

V. Results

The results from the OLS regression analysis provide support for the hypothesis that participation in high school athletics has a direct effect on 2002 income. All of the models produce results with the predicted sign. The model conducted on female respondents, Model E, is the only model that does not have the explanatory variables significant to the one percent level. The results on labor market success are presented in Table 2 and the results for education attainment in Table 3

In all of the models, there is a positive correlation between athletics and income. With the exception of the model limited strictly for women, the returns to income for athletics participation, all other things held constant, produce a minimum increase in yearly income of $8,950 in Model C and a maximum of $11,300 increase in yearly income in Model D. This supports the hypothesis that participation in athletics results in greater labor market success. The results for these variables are also significant

Table 2–Regression Results for Labor Market Success

Dependent Variable = Income						
	Model A (Total Sample)	Model B (College)	Model C (No College)	Model D (Male)	Model E (Female)	Hypothesized Sign
Variable Name						
Constant	-52,303.76	11,991.17	17,106.30	-52,365.37	-26,407.96	NA
	(-18.212)	-3.292	-10.507	(-11.447)	(-9.178)	
Explanatory Variables						
ATHLETICS	7,128.64	9,158.39	8,950.45	11,301.91	1,318.79	+
	(5.310)***	(4.345)***	(5.696)***	(5.180)***	-0.953	
MALE	20,248.35	27,385.24	12,224.20	NA	NA	+
	(21.441)***	(15.674)***	(13.780)***	NA	NA	
MINORITY	-6,816.93	-8,997.74	-5,903.81	-10,859.86	-2,309.72	-
	(-6.724) ***	(-4.692)***	(-6.354)***	(-6.334)***	(-2.301)**	
EDUCATION	5,605.07	NA	NA	6,915.66	3,955.48	+
	(26.342)***	NA	NA	(19.667)***	(18.375)***	
MEDUCATION	682.06	2,201.00	689.75	993.67	295.01	+
	(4.266)***	(7.714)***	(4.749)***	(3.725)***	(1.846)*	
Adjusted R^2	0.228	0.133	0.099	0.214	0.147	NA
n	5378	2656	2732	2779	2599	NA

Note: *t*-values are in parentheses

* Significant at the .10 Level

** Significant at the .05 Level

*** Significant at the .01 Level

at the one percent level, meaning that there is less than a one percent chance that men on average earn more than women in the labor market. Being a minority is the only variable expected to produce a negative effect on income. This is supported by the fact that each regression produced a negative return on the dependent variable for minorities on average. The largest negative effect is endured by males at nearly a $10,900 loss in income and the smallest impact being on females who only endure just over a $2,300 loss in income.

I thought it would be useful to run a regression to test whether participation in any extracurricular activity produces positive returns since individuals who participate in extracurricular activities should receive similar human capital traits as athletic participants. In order to test this claim, I ran an additional regression to compare the effects of participation in band on income to the effects of athletic participation. The regression (which was not reported in Table 2) was run using the same specifications as Model A with the addition of a dummy variable for band participation. The results show a positive effect of $7,873 for athletic participation and, interestingly, a negative effect of $4,485 for participation in band. These results have proven to be very beneficial in supporting my hypothesis that participation in athletics increases returns to human capital which are both desirable in the labor market and specific to athletic participation. This result, combined with the results of the other five regressions, supports my hypothesis that athletic participation in high school results in a significant increase in income even after controlling for other determinates of earnings.

In order to quantify the effect athletic

Table 3–Regression Results for Educational Attainment

Dependent Variable = Education		
Variable Name	Model F (Total Sample)	Hypothesized Sign
Constant	10.495	NA
	(94.483)	
Explanatory Variables		
ATHLETICS	1.127	+
	(13.655)***	
MALE	-0.324	-
	(-5.550)***	
MINORITY	-0.239	-
	(-3.836)***	
MEDUCATION	0.276	+
	(29.957)***	
Adjusted R^2	0.187	NA
n	5690	NA

participation has on the number of years of education the total population receives on average, Model F was run. The regression shows that the average person who participated in high school athletics received 1.127 more years of education, all other things held constant, than those who did not participate in athletics. There was a negative correlation for males, who received .324 less years of education on average. Such results seem to be conflicting with the notion that males receive higher incomes on average than women.

VI. Conclusion

When trying to estimate a person's future success in life, a common measure is one's income. It is important to look at how one's individual behavior and choices affect the success a person will have in the future. Since this is the case, one can use an earnings function to try to estimate how an individual's actions will affect their future income. The NLSY database gives researchers the opportunity to look at a variety of individual behaviors and try to determine their effects on income.

One such behavioral trait is one's participation in athletics through high school. The choice to participate in athletics has been proven to take physical and emotional tolls on the body. So the question is, why do rational individuals choose to voluntarily participate in an activity which seems to be detrimental to one's body? My research is designed to determine if there is an intangible return for individuals who participate in athletic that increase their value in the labor market. These intangible returns would more commonly be referred to as returns to human capital. The results of my research support the idea that athletic participation during high school yields high incomes in the labor market.

By the time the respondents to the NLSY survey were in their forties and well into their labor market careers, males who participated in high school athletics earned an $11,300 increase in income compared to similar non-athletes. There is also a slight increase in income, $1,300, for women participants, but the results are insignificant. The lack of significance and a large return for males is consistent with the literature on athletic participation. The ten fold increase for men could be in part due to the fact that men in this age group are more likely than women to hold management positions and to hold higher positions in management. The insignificance for women can be partially attributed to the fact that the effects of Title IX had not yet been received by these women.

Increases to income are significant for the total sample that attended or did not attend college. The returns to athletics for those who attended college is $9,150, and the returns for those that did not attend college is only slight lower at $8,950. Therefore, the returns to athletics are found in those who chose to enter directly into the labor market after high school and those who chose to receive additional education. In addition, my research shows that high school athletes receive 1.127 more years of school on average. This is beneficial in demonstrating that the benefits to athletics are not only a result of high school athletes choosing to receive more education, but that the positive effects are found in those enter the labor market out of high school. As a result, it can be concluded that the persons that participate in high school athletics possess qualities which are found to be desirable by employers at all education levels.

As stated before, the data used in this study would still be affected by Title IX not being fully implemented at the time the respondents were surveyed on their athletic participation. The datasets collected in the future will allow for an updated study of similar effects on income with greater participation in athletics for women. This new information could potentially show significance in female participation in athletics since there will be a greater sample size and the stereotype of female athletes which might have

existed will deteriorate as their participation increases. It would also be beneficial if future data were able to differentiate which and how many sports an athlete participates in during high school. It would seem apparent that different sports would produce different human capital characteristics and in turn produce different effects on income. New data are the key to creating new estimates on the effect athletic participation in school has on one's future income and educational attainment.

This study has been successful in demonstrating the positive effects athletics have on labor market success. Athletics is shown to matter very strongly for men but not for women. In addition, it is shown that there are high positive effects on income for those without college and for those with college educations. Such results demonstrate that returns to athletics are not solely due to greater educational attainment, but athletics must prepare individuals for the labor market by creating human capital characteristics which are desirable to employers. For this reason, athletics not only provide individuals with life long experiences and memories, but is also represents an investment in one's future.

Appendix A - Athletics Variable Explained

The explanatory variable used to measure athletic participation as of 1979 had to be modified to target the appropriate sample for my research. A survey question from NLSY asks if a student participated in athletics, cheerleading, or pep club while in high school. The NLSY presents the data for participation in athletics inaccurately. The variable should have a 4 if one participated in athletics, a 0 if one did not, and a -5 if they did not answer the question. When the data is transferred to SPSS it has a 4 for participation and a -5 for nonparticipation and for those that skipped the question on athletics. Since a relatively small portion of the respondents skipped the question, 617 of the over 12,000 interviewed, I assume the ones that skipped the question did not participate in athletics. A follow up question asked the participant's level of activity in the extracurricular club in which they participated. There were three levels for participation: A Member, An Active Member, and A Very Active Member.

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