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THE EFFECTS OF PARTICIPATION IN HIGH SCHOOL ATHLETICS AND THE NATIONAL HONOR SOCIETY ON FUTURE EARNINGS

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Abstract: The purpose of the present study is to determine the effects of two select types of high school extracurricular activities on future earnings: athletics and the National Honor Society. Utilizing data from the 1979 National Longitudinal Survey of Youth and a two-stage least squares estimation technique, the results of the present study indicate that high school athletes earn more in later years than honor society students. In fact, after controlling for academic achievement, honor society students earned no more in later years than non-honor society students. Finally, in examining the impact of participation in extra-curricular activities on future earnings, results of the present study suggest that participation in such activities increases earnings later in life.

JEL Classifications: J24, J31, I21

Keywords: Athletic Participation; Future Earnings

INTRODUCTION AND LITERATURE REVIEW

It is common among U.S. high school students to debate the importance of athletics versus academics. Is it more profitable in the long run to be a straight-A student or to be a great athlete? Will the jocks be working for the nerds, or vice versa? Although there have been several prior studies on the effects of high school athletic participation on future earnings, there has been little work done on the impact of academic excellence, as evidenced by membership in the National Honor Society, on future earnings.

In the United States, the National Honor Society (NHS) is a national organization that recognizes outstanding students who have excelled in the areas of scholarship, leadership, service, and character. The NHS has chapters at almost every high school in the United States. These local chapters establish their own rules regarding membership in the NHS, but these rules must conform to the parameters established by the national organization. These parameters include a minimum cumulative grade point average of 85 per cent or a B letter grade, involvement in various volunteer societies either in school or in the community, demonstrated leadership qualities, and high morals and ethics. Hence, membership in the NHS demonstrates not only that a student

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is excelling academically, but also that they are involved leaders who believe in adhering to a strict code of ethical conduct.

One would then expect that membership in the NHS should be a reasonable indicator of potential success in later life, especially as evidenced by high future earnings. Although various studies have examined the effects of academic achievement on future earnings, none have examined the role that NHS membership may play in the determination of future income (Jones and Jackson, 1990; Miller, 1998). This is important because NHS membership is about more than just getting good grades; it is about leadership and ethical behavior as well as academics. It is reasonable to assume that if a student excels academically but does not possess the necessary leadership qualities that would allow them to rise through the ranks of an organization, then they may not achieve success later in life, especially in the form of higher earnings. Hence, one of the purposes of the present study is to determine if National Honor Society membership has any relationship to future income. There has been no prior research on the relationship between NHS membership and future earnings.

As was the case with NHS membership, it is generally believed that participation in high school athletics also results in greater earnings later in life. The primary reason for this is because if students spend more time participating in athletics, then they spend less time on activities, such as watching television, that do not provide them with any meaningful skills (Pfeifer and Corneliben, 2010). In addition, athletics may confer on its participants certain traits and skills such as teamwork and the ability to take direction that may be useful in future employment (Pfeifer and Corneliben, 2010). Hence, it is expected that athletic participation should result in greater earnings later in life.

In examining data from the National Longitudinal Survey of Youth (NLSY), one finds support for these hypotheses: ten years after high school, individuals who participated in high school athletics earned, on average, 26 per cent more than those who did not play sports in high school; twenty years after high school, this disparity remained and in fact increased to 37 per cent. Regarding honor societies, individuals who were in the NHS in high school earned 36 per cent more ten years later than those individuals who did not belong to an honor society. Twenty years after high school, this difference increased to 47 per cent.

With regards to the difference between high school athletes and honor society scholars, the honor society scholars earned 14 per cent more than the athletes did ten years after high school. Twenty years after high school, this difference increased to 17 per cent. These differences are all statistically significant at the one per cent level of significance. Please see Table 1 for the t-test results. These results, of course, do not suggest any type of causal effect.

It is important to note, however, that those individuals who were athletes in high school or who were members of the National Honor Society no doubt had other attributes that may contribute to success in life after high school; these individuals may be more industrious, more focused, and more driven to succeed. Hence, it is important to control for these individual-level differences, otherwise the effects of both athletics and honor society participation on future earnings may be overstated.

Prior research on the effects of athletic participation on future earnings is somewhat limited, and the results are mixed. Some of the earliest works in this area were conducted by sociologists.

Howell, Miracle, and Rees (1984) looked at the effects of high school athletic participation on the earnings of men one and five years after high school. They found that there was no statisticallysignificant effect of athletics on future earnings. Picou, McCarter, and Howell (1985) looked at earnings eleven years after high school. They found that only white males benefitted from participating in high school athletics. Neither of these papers utilized an instrumental variable approach and both ignored variables such as experience and urban residence in their earnings regressions.

	High School Sport Participation	No High School Sport Participation	Honor Society Participation	No Honor Society Participation		T-Test (Difference Between Means)
1990	\$22,350	\$17,672	\$25,456	\$18,764	Sports versus No Sport Honor Society versus No Honor Society	12.28 10.19
2000	\$45,336	\$33,023	\$52,963	\$35,984	Sports versus No Sport Honor Society versus No Honor Society	12.43 9.60

Table 1

Economists who examined this topic include Long and Caudill (1991) and Barron, Ewing, and Waddell (2000). Long and Caudill (1991) looked at the earnings of males ten years after college. They found that high school athletic participation had a positive effect on future earnings. Barron, Ewing, and Waddell (2000) looked at the effect of high school athletic participation on educational attainment, employment, and future earnings. When simple OLS was used, the coefficient on high school athletic participation in the earnings regression was significant and positive; however, in a two-stage least squares model, where it was assumed that athletic participation was endogenous, the results were mixed. When a variable indicating the number of extracurricular activities that the individual participated in was included in the regression, the athletic participation variable had a significant and positive effect on future earnings. If, however, that variable was excluded, then athletic participation was insignificant.

One of the few recent studies to look at the effects of high school grades on future earnings was Miller (1998). Using data from the High School and Beyond data set, Miller found that, in the short run, grades have no significant effect on earnings. However, in the long run, which is defined as nine years after high school, it was found that higher grades resulted in higher earnings.

The present study differs and improves upon all of this earlier research in several ways. First, using Barron, Ewing, and Waddell (2000) as a guide, a two-stage least squares model is used to estimate the determinants of earnings; several prior studies used only ordinary least squares (OLS). Second, data on earnings ten years and twenty years after high school are used; most other studies looked at much shorter time frames. Third, the present study improves upon

Miller (1998) by using a much more defined and comprehensive measure of academic success: membership in the National Honor Society. Finally, the present study attempts to compare the relative effects of honor society membership to athletic participation on future earning; no prior study has examined this potential difference.

2. EMPIRICAL TECHNIQUE

In order to estimate the effects of high school athletic participation and honor society membership on future earnings, a standard log-linear wage regression is employed. This model was first used by Mincer (1958) in general wage studies. In order to control for the possible endogeneity of both athletic participation and honor society membership, a two-stage least squares model is used. The primary reason for using this model is because the individual-level variables used in the earnings regression may not fully capture the true abilities of the individual. It is possible that individuals that are more industrious and have better time management skills may be more likely to participate in high school athletics and the honor society. These traits may also increase their earnings later in life. Since other observed variables may not capture the effects of these traits on future earnings, it is reasonable to assume that participation in these activities is endogenous; hence, two-stage least squares is used to estimate the determinants of earnings.

In the construction of the equations, guidance was obtained from Barron, Ewing, and Waddell (2000). The first stage regressions include explanatory variables that attempt to capture the effects of parental involvement and individual-level attributes on the decision of whether or not to participate in sports or the honor society; such variables include the educational attainment of the parents, family income, race, sex, and place of residence. Height and weight, two factors that may affect the decision as to whether or not to participate in athletics, are also included in the first stage sports regression. Finally, the ratio of rank in class to total number of students is used as measure of academic achievement; this variable is only used in the first-stage regression for the honor society. The reason for including this variable is because one of the factors affecting admission to the NHS is a student's grades. Since this type of data is not included in the National Longitudinal Survey of Youth (NLSY), the data set used in the present study, rank in class is used as a proxy for a student's grades. All of the variables included in the second stage earnings regressions are attributes that may explain the earnings profile of the individual; such variables include experience, education, place of residence, sex, race, and, of course, participation in athletics or in the honor society.

Given the above, the first stage equation for the athlete regression is as follows:

SPORT = $a_0 + a_1 MGRADE + a_2 FGRADE + a_3 MALE + a_4 PUBLIC$ (1) + $a_5 HEALTH + a_6 WHITE + a_7 FSIZE + a_8 URB80 + a_9 INC80 + a_{10} HEIGHT$ + $a_{11} WEIGHT + a_{12} NE80 + a_{13} NC80 + a_{14} SOU80$ The second stage equation for the athlete regression is as follows: LINC = $a_0 + a_1 ESPORT + a_2 EXP + a_3 EXP^2 + a_4 EDBY + a_5 WHITE$ (2) + $a_6 MARR + a_7 DIV + a_8 MALE + a_9 URBAN + a_{10} NE + a_{11} NC + a_{12} SOU$ The first stage equation for the honor student regression is as follows:

HONOR =
$$a_0 + a_1$$
 MGRADE + a_2 FGRADE + a_3 MALE + a_4 PUBLIC (3)

+ a_5 HEALTH + a_6 WHITE + a_7 FSIZE + a_8 URB80 + a_9 INC80 + a_{10} NE80

+ a₁₁ NC80 + a₁₂ SOU80 + a₁₃ RANK

The second stage equation for the honor student regression is as follows:

$$LINC = a_0 + a_1 EHONOR + a_2 EXP + a_3 EXP^2 + a_4 EDBY + a_5 WHITE$$
(4)

All variables are defined on Table 2. ESPORT and EHONOR denote the variables SPORT and HONOR that were estimated in the first stage regressions.

Variable	Year	Definition
SPORT	1980	=1 if Participated in High School Athletics and 0 otherwise
SPORTH	1980	= 1 if Participated in High School Athletics=0 if Participated in Honor Society
HONOR	1980	=1 if Participated in Honor Society and 0 otherwise
MGRADE	1980	Highest Grade Completed by Mother
FGRADE	1980	Highest Grade Completed by Father
PUBLIC	1980	=1 if attended a Public School and 0 otherwise
HEALTH	1980	=1 if had Health Limitations and 0 otherwise
FSIZE	1980	Family Size
URB80	1980	=1 if Residence is Urban and 0 otherwise
INC80	1980	Total Family Income
HEIGHT	1980	Height in inches
WEIGHT	1980	Weight in pounds
NE80	1980	=1 if Region of Residence is Northeast and 0 otherwise
NC80	1980	=1 if Region of Residence is North Central and 0 otherwise
SOU80	1980	=1 if Region of Residence is South and 0 otherwise
LINC	1990, 2000	Log of Total Family Income
AGE	1990, 2000	Age in years
EXP	1990,2000	Years of Experience Working
EDBY	1990,2000	Years of Education Beyond High School
MARR	1990, 2000	=1 if Respondent is Married and 0 otherwise
DIV	1990, 2000	=1 if Respondent is Divorced and 0 otherwise
URBAN	1990, 2000	=1 if Residence is Urban and 0 otherwise
NE	1990, 2000	=1 if Region of Residence is Northeast and 0 otherwise
NC	1990,2000	=1 if Region of Residence is North Central and 0 otherwise
SOU	1990,2000	=1 if Region of Residence is South and 0 otherwise
MALE		=1 if Respondent is Male and 0 otherwise
WHITE		=1 if Respondent is White and 0 otherwise
RANK	1980	Rank in class (rank/number of students in class)

Table 2 Definitions of Variables

The above two sets of equations were estimated for the years 1990 and 2000; the year from which the school participation and first stage variables were drawn from is 1980. Even though not all of the students in the sample used in the present study were seniors in high school in 1980, they all did have the relevant experience, be it athletics or honor society membership, in 1980.

3. DATA AND RESULTS

All data were obtained from the National Longitudinal Survey of Youth (NLSY). The NLSY was constructed to be a nationally representative sample of the civilian non-institutionalized population at the time of the initial survey in 1979. Interviews with NLSY respondents are conducted annually, and retention rates have been relatively high, averaging over 90%. Each age-sex cohort is represented by a multi-stage probability sample drawn by the Bureau of the Census from a list of sampling areas that had been constructed for the Monthly Labor Survey. The NLSY employed extensive household interviews in the selected sampling areas in order to obtain as random and as representative a sample as possible.

In the present study, data from the 1980, 1990 and 2000 surveys of the 1979 NLSY was used. Only respondents who were attending high school in 1980 were included in the sample. After eliminating all cases with missing data, the final sample for the athletics regression contained 1,252 cases; the honor student regression contained 1,270 cases.

First-stage equations were estimated using a logistic regression. Second-stage equations were estimated with a standard log-linear functional form. Results for the athletic participation regressions are presented on Tables 3 and 4; results for the honor society regression are presented on Tables 5 and 6. Results for the first-stage regressions are available upon request.

Table 0

Table 3 Sports RegressionSecond Stage RegressionLog of Income - 1990		
Variable	Coefficient	Test Statistic
Constant	8.215	69.108***
SPORT (estimated)	0.468	2.566**
EXP	0.00488	11.506***
EXP ²	-0.000064	-7.223***
EDBY	0.0799	7.809***
WHITE	0.166	3.447***
MARR	0.0737	1.719*
DIV	0.097	1.263
MALE	0.445	9.857***
URBAN	0.1647	3.041***
NE	0.202	2.884***
NC	-0.0538	-0.855
SOU	0.0755	1.234

Adjusted $R^2 = 0.293$

Significant at 10% level = *

Significant at 1% level = ***

Significant at 5% level = **

Table 4 Sports Regression Second Stage Regression Log of Income-2000		
Variable	Coefficient	Test Statistic
Constant	9.027	62.208***
SPORT (estimated)	0.543	2.431**
EXP	0.00145	5.026***
EXP ²	-0.0000085	-2.665***
EDBY	0.096	8.77***
WHITE	0.0286	0.510
MARR	0.104	1.654*
DIV	0.134	1.733 [*]
MALE	0.539	10.169***
URBAN	0.0294	0.572
NE	0.206	2.335**
NC	-0.02	-0.245
SOU	0.142	1.804*

Adjusted $R^2 = 0.226$

Significant at 10% level = *

Significant at 5% level = **

Significant at 1% level = ***

Table 5 Honor Society Regression Second Stage Regression Log of Income - 1990

Variable	Coefficient	Test Statistic
Constant	8.427	91.059***
HONOR (estimated)	-0.0257	-0.204
EXP	0.0049	11.596***
EXP ²	-0.000063	-7.188***
EDBY	0.0894	8.747***
WHITE	0.166	3.443***
MARR	0.0646	1.506
DIV	0.0997	1.298
MALE	0.487	11.625***
URBAN	0.149	2.782***
NE	0.160	2.341**
NC	-0.0266	-0.44
SOU	0.0602	0.986

Adjusted $R^2 = 0.284$

Significant at 10% level = *

Significant at 5% level = **

Significant at 1% level = ***

Variable	Coefficient	Test Statistic
Constant	9.238	86.185***
HONOR (estimated)	0.0946	0.640
EXP	0.00137	4.87***
EXP ²	-0.0000077	-2.485**
EDBY	0.1012	9.407***
WHITE	0.022	0.395
MARR	0.121	1.971**
DIV	0.146	1.923*
MALE	0.596	12.527***
URBAN	0.0259	0.531
NE	0.189	2.36**
NC	0.0233	0.333
SOU	0.128	1.836*

Table 6
Honor Society Regression Second Stage Regression Log of Income - 2000

Adjusted $R^2 = 0.219$ Significant at 10% level = * Significant at 5% level =

** Significant at 1% level = ***

For the sports participation regressions, the results suggest that individuals who participated in high school athletics made more in 1990 than individuals who did not play sports; the results were similar for the year 2000. For the year 1990, even after accounting for the endogeneity of playing high school athletics, it was found that former athletes made over 46 per cent more than non-athletes. For the year 2000, that value increased to over 54 per cent. Hence, playing high school sports increased an individual's future earnings.

The same cannot be said however for membership in the NHS. After accounting for the possible endogeneity of honor society membership, it appears as if honor society membership did not increase one's earnings; these results are consistent across both years examined.

It is uncertain, however, if this result is due to the endogeneity of honor society membership. In order to test the robustness of the results obtained from the two-stage least squares regression, an OLS regression was estimated for honor society membership. The results for this regression also indicated that honor society membership did not have a significant effect on earnings. Thus, it appears that honor society membership, even when not taking account of its endogeneity, still does not have a significant and positive effect on earnings.

Interestingly, when the sports regression (equation (2)) is estimated using only OLS, the 1990 results are the same as the instrumental variables results; former high school athletes earn more than non-athletes. However, for the year 2000 data, the sports variable is insignificant; former high school athletes earn no more than non-athletes, holding all other factors constant. However, when endogeneity is controlled for, former athletes earn more than non-athletes in both time periods. Clearly, these results suggest that using instrumental variables produces more robust results than using simple OLS.

In order to further test the robustness of the above results, two more regressions were estimated. In the first regression, only those individuals who participated in either high school athletics or the honor society were included in the sample. Excluded were all individuals who

did not participate in either of those activities in addition to individuals who participated in both activities. Hence, if somebody was not in athletics or the honor society, they were excluded from this sample. In addition, if somebody was in both athletics and the honor society, then they were also excluded.

The first stage equation is as follows:

SPORTH =
$$a_0 + a_1$$
 MGRADE + a_2 FGRADE + a_3 MALE + a_4 PUBLIC (5)
+ a_5 HEALTH + a_6 WHITE + a_7 FSIZE + a_8 URB80 + a_9 INC80 + a_{10} NE80
+ a_{11} NC80 + a_{12} SOU80 + a_{13} RANK + a_{14} HEIGHT + a_{15} WEIGHT
The second stage equation is as follows:

LINC =
$$a_0 + a_1$$
 ESPORTH + a_2 EXP + a_3 EXP² + a_4 EDBY + a_5 WHITE (6)
+ a_5 MARR + a_7 DIV + a_6 MALE + a_6 URBAN + a_{16} NE + a_{16} NC + a_{16} SOU

In these regressions, SPORTH equals one if the individual participated in high school athletics and zero if they participated in the honor society; other variables are defined as previously. ESPORTH denotes the variable SPORTH that was estimated in the first stage regression. Results are presented on Tables 7 and 8. These results suggest that in 1990 there was no statistically significant difference in income between the former athletes and the former honor students. For the year 2000, however, that difference becomes significant; in that year, holding all else constant, athletes earned over 36 per cent more than the former honor students. These results thus corroborate the results found in the earlier regressions.

Log of Income-1990			
Variable	Coefficient	Test Statistic	
Constant	8.417	39.538***	
SPORTH (estimated)	0.259	1.413	
EXP	0.00496	7.821***	
EXP ²	-0.0000626	-5.17***	
EDBY	0.0918	5.694***	
WHITE	0.098	1.234	
MARR	0.0257	0.380	
DIV	0.088	0.670	
MALE	0.477	5.723***	
URBAN	-0.0034	-0.042	
NE	0.161	1.512	
NC	0.0199	0.209	
SOU	0.079	0.822	

Table 7 Comparison of Athletes and Honor Society Students Second Stage Regression Log of Income-1990

Adjusted $R^2 = 0.292$

Significant at 10% level = *

Significant at 5% level = **

Significant at 1% level = ***

Comparison of Athletes and Honor Society Students Second Stage Regression Log of Income - 2000		
Variable	Coefficient	Test Statistic
Constant	8.802	42.843***
SPORTH (estimated)	0.364	1.855*
EXP	0.00133	2.762***
EXP ²	-0.0000058	-1.134
EDBY	0.106	5.572***
WHITE	0.0282	0.267
MARR	0.149	1.399
DIV	0.234	1.699*
MALE	0.476	4.516***
URBAN	0.154	1.691*
NE	0.299	2.264**
NC	0.154	1.293
SOU	0.317	2.802***

Table 8
Comparison of Athletes and Honor Society Students Second Stage Regression
Log of Income - 2000

Adjusted R² = 0.20

Significant at 10% level = *

Significant at 1% level = ***

Significant at 5% level = **

Finally, the last set of regressions estimated examined the effects of participation in extracurricular activities on future earnings. The first stage equation is as follows:

 $CLUB = a_0 + a_1 MGRADE + a_2 FGRADE + a_3 MALE + a_4 PUBLIC$ (7)

+ a_5 HEALTH + a_6 WHITE + a_7 FSIZE + a_8 URB80 + a_9 INC80 + a_{10} NE80

+ a₁₁ NC80 + a₁₂ SOU80 + a₁₃ RANK

The second stage equation is as follows:

LINC =
$$a_0 + a_1 CLUBH + a_2 EXP + a_3 EXP^2 + a_4 EDBY + a_5 WHITE$$
 (6)
+ $a_4 MARR + a_7 DIV + a_8 MALE + a_9 URBAN + a_{10} NE + a_{11} NC + a_{12} SOU$

In these regressions, CLUB equals one if the individual participated in any high school activity and zero otherwise. ECLUBH denotes the variable CLUB that was estimated in the first stage regression. These results are presented on Tables 9 and 10. Results from these regressions suggest that participation in high school extra-curricular activities increased earnings but only in the year 2000. For that year, earnings for those who participated in high school activities were almost 52 per cent higher than those who did not participate. Hence, participation in high school clubs does increase earnings, although it appears as if the effect is somewhat delayed and that the effect is most significant and consistent for those who participated in high school athletics. This result is corroborated by the findings of most prior studies in this area.

Clubs R	egression Second Stage Regression Log c	of Income - 1990
Variable	Coefficient	Test Statistic
Constant	8.225	49.276***
CLUBH (estimated)	0.263	1.428
EXP	0.0049	11.573***
EXP ²	-0.000063	-7.193***
EDBY	0.083	7.944***
WHITE	0.157	3.355***
MARR	0.0678	1.576
DIV	0.108	1.404
MALE	0.506	11.98***
URBAN	0.16	2.954***
NE	0.178	2.55**
NC	-0.0338	-0.556
SOU	0.0545	0.902

Adjusted R² = 0.284 Significant at 10% level = * Significant at 1% level = ***

Significant at 5% level = **

Table 10
Clubs Regression Second Stage Regression Log of Income - 2000

Variable	Coefficient	Test Statistic
Constant	8.855	46.024***
CLUBH (estimated)	0.518	2.425**
EXP	0.0014	4.982***
EXP ²	-0.0000081	-2.578***
EDBY	0.0933	8.491***
WHITE	0.0211	0.385
MARR	0.122	1.982**
DIV	0.154	2.021**
MALE	0.619	12.54***
URBAN	0.0364	0.729
NE	0.228	2.689***
NC	0.0132	0.176
SOU	0.129	1.78*

Adjusted R² = 0.222 Significant at 10% level = * Significant at 1% level = ***

Significant at 5% level = **

4. CONCLUSION

The purpose of the present study was to determine the effects of two select types of high school extra-curricular activities on future earnings. Utilizing data from the 1979 NLSY and two-stage least squares estimation techniques, the results of the present study suggest that high school athletes earn more in later years than do individuals who did not play sports in high school; the

same is not true however for those individuals who were in the National Honor Society in high school. When comparing former athletes to former honor students, the difference still persists; participation in high school athletics confers on an individual a premium over the former honor society students in terms of earnings later in life. These results support and extend the findings of Lipscomb (2007) and Barron, Ewing, and Waddell (2000). Both studies found that participation in high school athletics, even after controlling for possible heterogeneity, results in higher earnings or better test scores. One of the more important contributions of the present study is the estimation of the effect of honor society participation on future earnings. After controlling for academic achievement, it was found that National Honor Society membership does not have a significant effect on future earnings.

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