HIGH SCHOOL CLUBS PARTICIPATION AND FUTURE SUPERVISORY STATUS

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Abstract

This paper examines the relationship between high school clubs participation and the probability a worker will become a supervisor and the types of responsibility she will have, using the NLSY79 dataset. While other papers have tried to explain what affects a worker's probability of being a supervisor, this paper focuses on the impact of participation in extracurricular activities during high school. Both probit and household fixed effects estimates show that clubs participation raises the probability an individual will be a supervisor and have high level supervisory responsibilities.

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1. Introduction

One of the debates in school funding revolves around the number and types of extracurricular activities offered to students. Many school districts respond to financial shortfalls by cutting back on these programs and focusing on "core" educational programs, at the expense of the arts, sports and other activities. Opposition to these funding cuts rests on the belief that these activities are an important part of students' educational and personal growth. For example, in 2004 a Texas state judge ordered the state legislature to develop a system that would increase school funding. Part of the state's opposition in the case rested on the argument that schools were wasting money on extracurricular activities, but the judge rejected this argument, deeming these programs necessary (Stutz, 2004). Supporters of these clubs and activities believe they help build skills, such as the ability to communicate and work with others, which are valuable to future employers. This paper addresses this issue by focusing on the link between participation in clubs during high school and a particular labor-market outcome: the probability of being a supervisor and holding higher level supervisory responsibilities.

Becoming a supervisor can represent an important change in a worker's career. Achieving supervisory status and acquiring supervisory responsibilities reflect an individual's movement up the firm hierarchy and are associated with higher wages (Rothstein, 2001). Quantifying the wage gains from changes in supervisory status only tells part of the story. Understanding which factors affect an individual's probability of becoming a supervisor helps us to build a more complete picture of this aspect of the employment relationship. To date, there are relatively few studies examining what factors lead to being a supervisor and having certain supervisory responsibilities.

Participation in extracurricular activities can lead to improved labor market outcomes if it results in increased human capital for the involved students. It can lead to greater opportunities to become a supervisor if participation builds leadership, organizational or social skills. Time constrained students must choose how to allocate their time between their formal studies and activities outside of the classroom. Participating in extracurricular activities can lead to greater human capital acquisition if it is an investment good, but may lower human capital if it takes time away from the student's studies. The latter effect depends on how students allocate their time and substitute between activities. Existing research shows that student-athletes spend more time studying than non-athletes and female student athletes spend less time watching television (Anderson, 2001). Even in cases when involvement in clubs and sports teams detracts from time spent studying, the net effect on human capital acquisition may still be positive if the student builds more human capital through clubs participation than she loses from the reduced time spent on her academics. Furthermore, the skills developed through active participation in extracurricular activities may be different than those which are developed in the classroom. Thus, sacrificing some classroom performance in favor of club activities may be the optimal strategy for maximizing future labor market outcomes.

It is also possible that active involvement in clubs can enhance student learning in the classroom. Using a fixed effects model, Lipscomb (2007) finds that participation in athletics is positively correlated with both science and math test scores while getting involved in clubs results in higher math test scores. Lipscomb's findings indicate that athletic participation reinforces classroom performance, complicating the relationship between clubs participation and human capital acquisition even further. In the absence of direct and complete measures of human capital, researchers must examine the link between clubs participation and educational

and labor market outcomes to determine whether these activities provide non-consumption benefits to participants.

The existing empirical literature in economics has focused mainly on the effect of participation in high school athletics on educational and labor market outcomes. Barron, Ewing and Waddell (2000) analyze the relationship between participation in high school athletics on high school rank, educational attainment, future employment and weekly wages. Barron et al also estimate the relationship between being a supervisor and high school athletics, failing to find a significant correlation between the two. Eide and Ronan (2001) estimate the relationship between athletics participation in high school and educational attainment and future wages. Their results are mixed, finding a negative correlation with educational attainment for white men, a positive correlation for black men and white women, and no correlation for Hispanics or black women. They do not find a significant correlation between athletics and wages for any of these groups. Ewing (2007) finds that in addition to earning higher wages, former high school athletes also receive more benefits. Anderson (2001) finds a positive link between participation in sports and educational outcomes for white athletes. There are also several empirical papers in the sociology literature which investigate the link between high school athletics and various educational outcomes (see Anderson, 2001 for a summary of those papers). Kuhn and Weinberger (2005) focus on the effect of leadership positions on labor market outcomes. They find that men who hold leadership positions in high school are more likely to be in managerial occupations and earn higher wages. The focus on leadership positions is interesting and important; however, few students ever hold these positions, so their results can not speak to the broader impact of participation in high school extracurricular activities and labor market outcomes.

Using data from the 1996 and 1998 waves of the National Longitudinal Surveys of Youth 1979 cohort (NLSY79), this paper examines the link between high-school clubs participation and becoming a supervisor and having certain supervisory responsibilities. The paper makes three primary contributions to the literature. First, to my knowledge, this is the first paper to analyze the link between clubs participation in general (rather than focusing on athletics or leadership positions) and supervisory status and responsibilities. Second, in this paper, I employ both a household fixed effects estimator and a new instrumental variables approach to account for potential endogeneity of the clubs variable. Third, by using information on different types of extracurricular activities, I can estimate different labor market effects for participation in various types of activities.

The results show a positive correlation between clubs participation in high school and being a supervisor. Conditional on being a supervisor, individuals who participated in more types of clubs in high school are more likely to be responsible for setting pay and determining promotions and have a greater scope of supervision. These results persist after controlling for household fixed effects and school quality. Estimates obtained using instrumental variables estimation continue to show a positive effect of clubs participation on supervisor status, however the estimates are no longer statistically significant.

2. Background on supervisor status

2.1 Theoretical background

There is little theoretical work aimed specifically at explaining which workers are likely to become supervisors. However, there is a significant literature investigating promotion mechanisms and workers' movement up the firm hierarchy. Since promotions are strongly

correlated with changes in supervisory status and increases in supervisory responsibility (Pergamit & Veum, 1999), any analysis of supervisory status and responsibilities requires an understanding of the promotion process. Much of the theoretical literature on promotions is aimed at explaining the link between promotions and wage growth, or the strategic use of promotions to prevent worker turnover, not directly focusing on which worker characteristics are likely to lead to a promotion, and ultimately supervisory responsibility. Still, this literature does provide insights into which workers are likely to be promoted up the job ladder and ultimately reach the upper levels of the firm hierarchy, where they are very likely to hold upper level responsibilities, such as pay setting and determining promotions.

Some models postulate tournaments are used at each level of the hierarchy to induce greater effort from the employees by giving a promotion and wage increase to the winner (Lazear & Rosen, 1981; Rosen, 1986). More able and driven workers continue to move up the ladder in this fashion. However, as Baker, Jensen and Murphy (1988) point out, while a tournament may be efficient in eliciting effort, the winner of the tournament may not be the best suited worker for the promotion. Unfortunately, models based on the tournament mechanism do not provide guidance in developing an empirical model for cross-sectional data since I do not observe direct performance measures. Personnel records or individual data for a specific occupation, on the other hand, may contain the necessary information to test the tournament hypothesis.[1]

Rosen (1982) and Calvo and Wellisz (1979) develop models where worker quality is positively associated with hierarchical position and the return to ability rises with the worker's level. Bernhardt (1995) develops a hierarchical model where more educated employees are

[1] For example, personnel records often contain data on employee evaluations conducted by supervisors which can serve as a proxy for the worker's ability or productivity. Data on sales workers could contain information on the value of each representative's sales.

promoted before their equally or more able, but less educated co-workers, suggesting that the model should account for the worker's educational attainment. Carmichael (1983) presents a model where workers with greater job tenure are promoted and receive higher pay as a mechanism to achieve optimal employee turnover. These models suggest that the variables typically included in a Mincerian wage equation to proxy for a worker's stock of human capital: education, age and tenure, should be included in an empirical model of supervisory status. In light of Rosen (1982) and Calvo and Wellisz's (1979) findings; the model estimated in this paper also includes the armed forces qualifying test score (AFQT) as a measure of ability not captured by the other variables.

Rosen's (1982) model also predicts that an increase in the span of supervisory control will also raise wages. This is distinct from an increase in the degree of supervisory responsibility, which measures how closely the individual supervises others and the amount of responsibility over setting pay and assigning job tasks. This paper will estimate both the wage effects of being a supervisor and whether the span of supervision is correlated with supervisors' wages.

Several papers indicate that firm characteristics also play an important role in determining workers' movements up the firm hierarchy. Idson (1989) shows that workers in larger firms receive more promotions and total job changes using a cross-section of working age men. Analyzing personnel records from 400 firms, Abraham and Medoff (1985) find the promotion process is different in unionized relative to non-unionized firms. Since unionization and firm size affect promotion process, it is also likely that they will affect the probability a worker will be a supervisor as well as the types of responsibility she will hold.

2.2 Empirical literature on supervisory status

A couple of papers look at the determinants of supervisor status. Barron et al (2001) and Rothstein (2001) are the two studies most closely related to the present paper. Barron et al investigate the relationship between supervisor status and participation in high school athletics failing to find a significant correlation between the two. This paper differs from Barron et al in three significant respects. First, I look at clubs participation more broadly, not just athletics. Second, I use a different approach to deal with the potential endogeneity of the participation variable. Third, in addition to supervisor status, I investigate the relationship between clubs participation and particular types of supervisory responsibility. While Rothstein uses the 1996 wave of the NLSY79 to analyze the determinants of supervisor status and responsibilities, her study does not consider the importance of high school clubs participation.

Rothstein is also the only study to directly estimate the effects of supervisory responsibility on wages, finding a positive correlation between being a supervisor and wages. Furthermore, she finds that having responsibility for pay and promotions has a larger wage impact than being responsible for job tasks. A couple of other papers look at wage effects of responsibility for a narrow group of workers. Ferrall (1995) finds that returns to responsibility help explain the rise (decline) in wage dispersion between (within) job levels for U.S. engineers between 1961 and 1986. In line with Rosen's prediction that the span of supervision matters, Cannings (1988) finds that the number of employees supervised has a positive impact on wages for middle managers in a Canadian firm.

3. Data and estimation routine

3.1 Estimation strategy

This paper analyzes the effect of participation in high school extracurricular activities on future supervisory status and responsibilities. The simple approach estimates these effects using probit (or ordered probit in the case of specific responsibilities) estimation. However, there are two potential problems with this approach: 1) endogeneity of clubs participation, and 2) measurement error in the clubs variable. The first econometric issue has been well documented in the existing literature and previous studies have addressed it to varying degrees. Students who participate in clubs also may possess other attributes/skills which are valued in the labor market, leading to an upward bias in the estimated effect of clubs participation on labor market outcomes. The simple way to address this issue is through the use of individual fixed effects. However, the key variable in the model (clubs participation in high school) is only observed once, ruling out fixed effects as a plausible candidate.

The second problem, measurement error, will lead to a downward bias in the estimated effect of clubs participation on labor market outcomes. Measurement error is a potentially significant problem in this dataset for multiple reasons. First, information on clubs participation is collected in 1984, when respondents are between the ages of nineteen and twenty-seven. Thus, the survey is asking people to report on activities that occurred up to ten years earlier. Second, some individuals may report that they were involved in a particular type of activity, even if their participation was short-lived or superficial. With both endogeneity and measurement error, the direction of the bias can not be determined ex ante.

Other papers in the literature have taken various approaches in dealing with the potential endogeneity of the participation variable. As a robustness check, Barron et al (2000) instrument

for participation in athletics with school size and other socioeconomic and school quality variables. However, both previous studies (Betts, 1995; Hanushek, 1986) and results in this paper show that school characteristics affect student and labor market outcomes. When analyzing the effects of holding leadership positions in high school on labor market outcomes, Kuhn and Weinberger (2005) control for family background and high school fixed effects. Robustness checks which add controls for psychological traits as well as beauty and height support their main results. While their series of robustness checks provides some evidence that their findings may capture a true correlation, they do not control for individual fixed effects or employ an IV estimation routine which can account for the potential correlation between unobserved ability and leadership roles. Eide and Ronan (2001) use height as an instrument for high school sports participation. I do not take this approach in the current paper for two reasons. First, while height shows a strong correlation with participation in athletics, it is not highly correlated with general extracurricular participation. Second, it is not clear that height is a valid instrumental variable; other studies have shown that height is correlated with labor market outcomes (Persico et al 2004). Rees, Lopez, Avarett and Argys (2008) show that birth order is correlated with participation in athletics and other extracurricular activities. This suggests birth order as a possible instrumental variable. Unfortunately, while being firstborn and the number of siblings are both correlated with clubs participation, tests indicate these variables may not be exogenous, at least not for the pay and promotion variables. In other cases, the instruments are too weak to conduct meaningful statistical inference.

This paper uses two alternative approaches to deal with the potential endogeneity of the clubs variable. The first approach controls for household fixed effects by transforming all variables into deviations from household means. This will account for any potentially

confounding effects of the individual's family background, such as parental education or socioeconomic status. The second approach employs instrumental variables estimation using information on siblings' clubs participation to instrument for the clubs participation variable. The use of sibling data has been employed in various studies, most notably in Ashenfelter and Krueger (1994), which uses data on twins to estimate returns to schooling. By using data on multiple individuals from the same household, the authors are able to control for family specific fixed effects by transforming the data into deviations from household means. Then, to account for potential measurement error, the authors use the sibling's report of the other respondent's educational attainment to instrument for the respondent's self reported level of schooling. This approach has been used in several papers to estimate the returns to schooling, including Ashenfelter and Zimmerman (1997) which uses data on brothers and fathers and sons, and Bronars and Oetinger (2006) which uses sibling data from the NLSY79, amongst others. The Bronars and Oetinger paper is particularly relevant to the present study since it employs the same dataset.

Consider the following specification for each of our dependant variables:

$$y_{ijt} = \beta x_{ijt} + \nu_i + \upsilon_j + \varepsilon_{ijt}, \quad (1)$$

where y is the value of the dependant variable for individual i in household j at time t, x is a vector of individual and firm characteristics, ν_i is an individual fixed effect, υ_j is a family (or household) fixed effect and ε_{ijt} is an iid disturbance.[2] It is assumed that both the individual and the household fixed effects are correlated with unobserved factors which fall into the error term.

[2] The dependant variables analyzed in this paper come in various forms: binary, ordered and continuous. In the case of supervisor status, which is a binary variable, we estimate the model via probit estimation. This would indicate that equation (1) does not properly reflect the estimating equation. In this case, we can think of y as representing the latent variable y*. In the end, all dependent variables are transformed into continuous variables when converted into deviation from household means. Furthermore, a quick check shows that estimating the basic supervisor status model using either the probit or least squares estimators yield highly similar results.

Thus, fitting the model using least squares estimation will yield biased estimates. The household fixed effect (HFE) captures all aspects of the home environment which are common to each individual in that household and may reflect both environmental (nature) and genetic (nurture) commonalities. Transforming each variable in the model into deviations from household means eliminates the household fixed effect, but does not eliminate the individual-specific fixed effect,

$$dy_{ijt} = \beta dx_{ijt} + d\nu_i + d\varepsilon_{ijt}. \quad (2)$$

Thus, this transformation of the data can eliminate part of the potential bias due to endogeneity; however there is still the potential bias due to a correlation between the individual fixed-effect and the error term. The HFE model still provides some useful insights by indicating whether unobservable household effects create any bias when estimating the models via probit (supervisor status), ordered probit (responsible for pay or promotions), or least squares estimation (sum of responsibilities) or Tobit estimation (span of supervision).

To account for the potential endogeneity due to unobserved individual characteristics, I use the average of the siblings' clubs participation as an instrument for each respondent's clubs participation in high school. This approach will also eliminate the downward bias from measurement error if the measurement errors for own clubs participation and siblings' participation are not systematically correlated. Siblings' clubs participation is likely to be correlated with household effects; however this will not pose a problem if the household effects do not exert any influence on the coefficient estimates. In any case, multiple tests are provided to support the exclusion restriction for the instruments. To facilitate these tests and strengthen the first stage estimation, an indicator variable for regular attendance (more than once a month) at religious services in 1979 is included as a second instrument. Including a second instrument allows estimation of Hansen's J-statistic which tests whether the instruments have been properly

excluded from the second stage regression. The indicator variable takes a value of one in 47.5 percent of the observations used in the full sample.

Bronars and Oetinger (2006) use sibling data from the NLSY79 to instrument for self-reported schooling. In this dataset, there are many individuals who have more than one sibling in the survey. For these individuals, they took the sibling report which was determined to be the most likely to be accurate. However, this throws out potentially useful information, so I use the average value of the clubs variable for all other siblings as the instrumental variable.

I fit each model using three estimators. The basic analysis fits the supervisor status model using probit estimation, the pay setting and promotion setting models using ordered probit estimation, the sum of responsibilities variable using least squares and the scope of supervision using the Tobit estimator. In addition, each model is estimated via least squares on the transformed data (HFE) as well as using instrumental variables (IV) estimated through two-stage least squares as described above.

3.2 Data and variables

The empirical estimation conducted in this paper makes use of the supervisor variables from the 1996 and 1998 waves of the NLSY79. A total of 17,035 individual-year observations are available between the two years. Of these observations, information on supervisory status and responsibilities as well as clubs participation in high school is available for 11,564 respondents. From this sample, observations are excluded if any of the key variables are missing. I also exclude individuals working less than thirty or more than one hundred hours per week, leaving a final sample containing 9,275 observations on 5,681 individuals for the

supervisory status models model. Results on the sample including all workers, regardless of hours worked, yield qualitatively similar results.

First, I investigate the link between clubs participation in high school and the probability of being a supervisor using the probit estimator. Models investigating the determinants of holding certain responsibilities are estimated via ordered probit estimation, while least squares estimation is used to estimate the effect of clubs participation on the sum of responsibilities held by supervisors as well as the scope of supervision. The models control for clubs participation, firm size variables, union membership, and individual characteristics. Each model is then estimated using the household fixed effects estimation and instrumental variables estimation routines. Next, a robustness check is performed by including school quality variables as regressors. Finally, results are provided separating clubs participation into three categories: athletics, academic, and nonacademic.

The NLSY data set contains information on the types of clubs the respondent was a member of in high school, with eight categories. These categories are: youth organizations, hobby, student government, yearbook and newspapers, athletics, performance art, honor society and other clubs. The information on high school clubs participation was collected in 1984, when the respondents were between the ages of nineteen and twenty-seven. Borghans, ter Wheel and Weinberg (2006) use this information to construct a variable which sums up the number of types of clubs in which the individual participated. I take the same approach here. Thus, the clubs variable takes integer values between zero (did not belong to any clubs) to eight (participated in clubs in all eight categories).

The clubs variable does not capture the total number of clubs in which an individual was active, or the extent of the individual's involvement. An individual only participating in athletics

may have been involved with more groups (playing three different sports) than someone who participated in two clubs in different categories. While the clubs variable is not a perfect measure of participation in extracurricular organizations, it does contain useful information on social activities. Using the clubs variable as a measure of social skills, Borghans et al (2006) find that sociability has an impact on wages and choice of occupation. It is also likely that these skills are very important in management positions, affecting a person's ability to supervise others and making these skills an important determinant of promotions and the assignment of supervisory responsibility.

This paper uses five different supervisor variables: supervisory status, responsibility for pay setting, responsibility for determining promotions, sum of responsibilities and the number of supervisees. If a respondent reported working during the last two years, she was asked whether she was responsible for supervising the work of others. Thus, the supervisory status variable is an indicator variable taking a value of one if the individual reports being a supervisor and zero otherwise. As a follow up, if a respondent was a supervisor, she was also asked whether she had responsibility for setting pay, determining promotions or assigning tasks to others. There were three possible responses for each category: no responsibility, some responsibility, or full responsibility. These variables are codes with a value equal to two for full responsibility, one for some responsibility and zero for no responsibility. A model for responsibility over tasks was not estimated because the vast majority of supervisors in our sample (94.1 percent) have at least some responsibility for setting tasks. By comparison, only 43.2 (60.1) percent of supervisors reported being responsible for setting pay (determining promotions). The sum of responsibilities variable adds the three responsibilities variables together, taking a value between zero and six.

In addition to specific responsibilities, the data also contain information on the number of workers a person supervises. If the skills developed through participation in extracurricular activities are important for supervisors, it is important to ask whether the importance of these skills increases with the number of supervisees. In other words, do they affect the span of a supervisor's responsibilities? All four of these models are estimated using only observations on individuals who identify themselves as supervisors. This way I focus specifically on how these skills affect the types of responsibility held by supervisors.

In addition to the clubs variable, the model includes several individual controls including gender, race (black and Hispanic dummies), tenure, tenure squared, years of schooling completed, the AFQT score percentile and whether the respondent was part of a union or employee association.[3] There are also two firm size variables: an indicator for whether the firm has multiple locations and the log number of employees at the respondent's location. All models contain industry and year indicators.

Greater clubs participation is expected to increase the probability of being a supervisor and to be positively correlated with the chances that a supervisor will be responsible for setting pay and determining promotions. The tenure-promotion probability profile should be convex, while the theoretical literature predicts that ability and level of education lead to a greater likelihood of being promoted and putting the worker in a supervisory position. Larger firms provide more opportunity for career advancement, while unions will lead to fewer opportunities for promotion either by reducing turnover (either voluntary or involuntary) or compressing the hierarchy structure. Negative and statistically significant coefficients on the gender or race variables would be consistent with discrimination in determining who becomes a supervisor;

[3] The respondent's age and age squared were included in initial specifications of the model; however the coefficients on these variables were both statistically and economically insignificant. The same results were obtained on the coefficient for the age variable when age squared was dropped. Thus, both variables have been excluded altogether.

however discrimination is not the only valid conclusion. Alternatively, these results may reflect unobservable differences between these groups, such as educational quality (beyond high school).

Before turning to the results, table one provides summary statistics for the key variables. Columns one and two provide the mean and standard deviations of each variable for the full sample. Thirty-eight percent of the respondents report supervising others. The average person participated in 1.28 types of clubs (most individuals report having some clubs participation). Some other interesting statistics to note are that union members comprise roughly fifteen percent of the observations and the worker's firm has multiple locations 67.8 percent of the time. The average years of school completed is 13.26 while the average AFQT score percentile is 41.4. The average age is 35.74 years while the average tenure on the job is just under 5.4 years.

Columns three and four contain the summary statistics for the sample containing observations only on supervisors. Supervisors report having at least some responsibility for setting pay 41.6 percent of the time, while 58.5 percent report being at least somewhat responsible for determining promotions. The average supervisor has 14.36 supervisees. A couple of differences between the two groups merit attention. Supervisors have received more promotions in the past, have completed more years of schooling and have longer job tenure, on average.

Table two provides the frequency distribution for the clubs participation variable. Over seventy-three percent of individuals report having been involved in at least one club during high school. Nearly thirty percent of the sample reports participating in only one type of club while over sixteen percent reports involvement with two types of clubs and 8.74 percent in three types

of clubs. Overall, the frequency table shows significant variation in clubs participation during high school.

Table three shows the rate at which supervisors report holding responsibility for setting pay, determining promotions and assigning tasks. Only 13.1 (28.54) percent of supervisors report having full (some) responsibility for pay setting. The corresponding statistics for determining promotions are 16.13 and 42.35 percent, respectively. On the other hand, the majority of supervisors report having full responsibility in assigning tasks.

4. Results

4.1 Supervisor Status and Responsibilities

Next, I turn to the results of the basic estimation routine (table four). Each model includes industry and year indicators in addition to the explanatory variables described in section three. Column one presents the marginal effects (with standard errors in parentheses) for the supervisory status variable. Being involved with one additional type of club is associated with a 2.3 percentage point increase in the probability of being a supervisor. This translates into a roughly six percent increase over the mean.

Union membership translates into a substantially lower probability of being a supervisor. Union members are sixteen percentage points less likely to be supervisors. Individuals are also less likely to be supervisors if they work for a larger company, although it takes more than a doubling of firm size to yield a 0.8 percentage point decline in the probability of being a supervisor. Both more years of school and higher ability raise the probability of being a supervisor. A twenty point increase in the AFQT score percentile is equal to participating in one more type of club, while an additional year of school appears to have a smaller impact on the

probability of being a supervisor than clubs participation. Thus, it appears the skills developed by participating in clubs may be equally important to more traditional measures of human capital in determining which workers will become supervisors. As expected, the tenure-supervisor relationship is concave. Finally, women are less likely to be supervisors. This finding corroborates previous research and is consistent with gender discrimination, although that is not the only possible conclusion.

Next I ask whether clubs participation plays a role in determining what types of responsibility a supervisor will hold as well as the degree of responsibility. Columns two through five provide the results for having responsibility over setting pay and determining promotions, the sum of responsibilities and the span of supervision. Each model is estimated on the sample of supervisors. The results show that participation in extracurricular activities is important in predicting which supervisors will be responsible for both setting pay and determining promotions. Columns 2-3 present the marginal effect on having full responsibility for pay setting and determining promotions, respectively. Participating in one more type of club is associated with a 1.2 percentage point increase in the probability a supervisor will be fully responsible for setting pay and a 1.1 percentage point increase in the probability of being fully responsible for determining promotions. Given that only 13.1 percent of supervisors report having full responsibility for pay setting, the estimated effect represents a nearly ten percent increase. In both cases, participating in one additional club has roughly the same impact on the probability of holding high-level supervisory responsibility as an additional year of school. Clubs participation also shows a strong correlation with the sum of responsibilities. Finally, involvement in high school clubs does have a statistically significant correlation with the number of supervisees; however the result is only significant at the ten percent level. Overall, the results

indicate that clubs participation is important not only in predicting who becomes a supervisor, but also the types of responsibility a supervisor is likely to hold.

4.2 Household fixed effects and instrumental variables estimation

Table five presents the results for each model using three different estimation routines: the basic approach reported in table four, household fixed effects and instrumental variables estimation. Bothe the HFE and IV estimates use only observations on individuals who have at least one sibling for whom data on clubs participation is available; otherwise, we do not have an instrument for the clubs participation variable. For the sake of brevity, only the coefficients on the clubs variable are presented. The supervisory status estimates are highly consistent between the probit and HFE estimators. The IV estimates show a smaller effect of clubs participation on the probability of being a supervisor, and the coefficient is no longer statistically significant. Much of this is due to the decline in precision; the standard error has increased from 0.0043 in the probit estimates to 0.023. This is in part due to the strength of the instruments. While they past standard tests rejecting the hypothesis that the instruments are weak (Anderson statistic), the 1^{st} stage partial R-square shows that they are not very strong instruments.

The results for specific responsibilities are mixed. The HFE estimates show no effect of clubs participation on being responsible for setting pay while the IV estimator shows a stronger effect of clubs participation than the ordered probit results (although the estimate is again not statistically significant). The reverse holds true for the promotions model; the HFE model yields a coefficient that is nearly double the marginal effect obtained via ordered probit estimation (but statistically insignificant) while the IV model shows virtually no correlation between the two variables. Household fixed effects estimation yields highly similar results to least squares for the

sum of responsibilities model. The IV estimation routine also continues to show a positive effect of clubs participation on the sum of responsibilities. However, the estimated effect is much smaller and no longer statistically significant. Finally, accounting for household fixed effects, we see a negative correlation between the span of supervision and clubs participation. On the other hand, the IV estimates show a positive and statistically significant (at the percent level) effect of clubs participation on the span of supervision. Participating in one additional type of club leads to a fifteen percent increase in the number of supervisees. In all cases, Hansen's J-statistic strongly supports the validity of the instruments while the Anderson statistic rejects the hypothesis that the instruments are weak.

The validity of the instruments requires that siblings' average clubs participation be correlated with own clubs participation but not correlated with the dependant variables. The coefficients from the first stage of the instrumental variables estimates (not presented here) along with the 1st stage partial R-square and the Anderson statistics confirm that siblings' clubs participation is not a weak instrument. As an additional test of the second condition, I estimate each model including the siblings' clubs variable as a regressor. The results, provided in the appendix in table A1, support the instrument's validity in all five models. Overall, the positive effect of clubs participation on supervisor status and the sum of responsibilities persists even after controlling for household fixed effects, while the positive impact of clubs participation on the span of supervision persists when using IV estimation.

4.3 Robustness check: school quality variables

There is some question whether the clubs variable is capturing effects attributable to the quality of the respondent's high school, which may continue to be a problem even when

controlling for household fixed effects if siblings from the same household attended different high schools. This can arise if the family moves after one child has graduated from high school but before another child has graduated or even entered high school. Alternatively, one sibling may attend public school while the other attends private school (or a local vocational school). To address this issue, I estimate each of the models using both the HFE and IV estimators adding information on school quality. The data contains information on the respondent's school at age fourteen, including school size (number of students) the fraction of students who are disadvantaged and the percentage of tenth grade students who drop out by the tenth grade. It should be noted that the inclusion of these variables leads to an additional loss of observations. The sample, which initially contained 5,461 observations, has only 3,246 observations for the supervisory status model; this is a loss of over forty percent of the sample. Table six provides some summary statistics for the school and home environment variables. The average school size is 1,362 while at the average individual's school, 23.77 percent of students were disadvantaged and 15.83 percent dropped out by the tenth grade.

Table seven presents the results for each of the dependent variables using both the HFE and IV estimators. Only the coefficients for the clubs participation, school quality and size variables are presented. Panel A provides the results using HFE estimation. In most cases, they are quantitatively very similar to those presented in table five. Instead of decreasing the estimated coefficients, including the school size and quality variables results in a slight increase in the estimated effect of clubs participation on the amount of responsibility a supervisor has in determining promotions. Participating in one additional type of club is now associated with a 2.8 percentage point increase in the probability of being a supervisor, while supervisors who participated in high school clubs are more likely to have responsibility for determining

promotions and greater overall responsibility. The span of supervision continues to show a negative correlation with clubs participation. School size generally shows a negative correlation with supervisory status and responsibility variables, indicating that it would not be a valid instrument.

The results obtained via instrumental variables estimation (panel B) do not show any statistically significant results for the clubs participation variable. Much of this is due to the increase in the standard errors when compared to the HFE estimates. The 1st stage partial R-squares also show that the instruments are somewhat weaker in this sub-sample than in the larger sample that excluded the school quality variables. The HFE results indicate that these variables are indeed reflecting something other than school quality, giving us greater confidence that the clubs variable is actually measuring some set of skills and not other factors. However, the IV results do not provide any additional insights.

4.4 Different types of clubs

Previous studies have focused on the effects of participation in high school athletics on labor market outcomes. To provide a more direct comparison with earlier studies, I estimate the effects of clubs on supervisory status and responsibilities by club type. Club participation is grouped into three categories: academic (student government, yearbook and honor society), nonacademic (hobby, performing arts, and other clubs) and athletics. The models were also estimated with dummies for participation in each separate type of club. Those results (not presented here) generally support the groupings listed above. Each model is estimated using these three clubs categories via household fixed effects estimation.[4] The results, presented in

[4] Attempts to instrument for each of these three clubs variables lead to a substantial increase in the standard errors, making any inference extremely difficult.

table 8, show that participation in academic clubs increases an individual's prospects of becoming a supervisor later in life. Participation in non-academic clubs or athletics does not have a significant effect. T-tests fail to reject equality of the coefficients for any pairing. Participation in academic clubs also shows a positive and statistically significant effect on holding upper level responsibilities. Involvement in both academic and non-academic clubs shows a negative correlation with the span of supervision; however this correlation is not statistically significant. None of these models finds a statistically significant link between participation in high school athletics and supervisory responsibilities. The results for the athletics variable are consistent with Barron et al (2000).

5. Conclusions

Employing the NLSY dataset, this paper estimates the correlation between participation in extracurricular activities during high school and the probability an individual will be a supervisor as well as the direct effect of participation on wages. I find that individuals participating in more types of clubs are more likely to become supervisors and have responsibility for pay setting. These results are robust to the inclusion of controls for high school quality and size.

The next step in the literature is to determine what skills are actually being developed through clubs participation. Does it build social skills (as Borghans et al 2006 suggests), leadership skills (as in Kuhn and Weinberger 2005) or something else? Do different activities help to develop different types of skills which are valued differently across occupations? This would be consistent with Borghans et al (2008), who find that different types of social skills are valued in different occupations. For example, involvement in student government might help to

build leadership skills which are valuable in management positions, while involvement in team sports builds teamwork skills which are important in other occupations.

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Table 1: Summary Statistics

	Full Sample		Supervisors	
variable	Mean	Std. Dev.	Mean	Std. Dev.
Supervisor indicator	0.38	(0.486)	1	(0.0)
Responsible for pay indicator			0.416	(0.493)
Responsible for promotions indicator			0.585	(0.493)
Responsibility for pay			0.547	(0.714)
Responsibility for promotions			0.746	(0.716)
Sum of responsibilities			2.774	(1.654)
Number of supervisees			14.36	(79.81)
Clubs in high school	1.278	(1.388)	1.49	(1.489)
Firm size (number of employees)	549.7	(2,629)	524.3	(2,211)
Firm has multiple locations indicator	0.678	(0.467)	0.685	(0.465)
Married indicator	0.588	(0.492)	0.636	(0.481)
Union member indicator	0.151	(0.358)	0.1	(0.3)
AFQT score percentile	0.414	(0.282)	0.47	(0.29)
Highest grade completed	13.26	(2.369)	13.67	(2.479)
Age	35.74	(2.462)	36.79	(2.449)
Tenure	5.376	(5.044)	6.032	(5.198)
Tenure squared/100	0.543	(0.854)	0.634	(0.917)
Female	0.476	(0.499)	0.432	(0.495)
Black	0.288	(0.453)	0.245	(0.43)
Hispanic	0.180	(0.384)	0.173	(0.378)
Observations	9,275		3,528	
Individuals	5,681		2,534	

Number of supervisees variable has 3,519 observations.

Table 2: Frequency of clubs variable responses

Number of types of clubs	Frequency	Percent
0	3,375	36.39
1	2,775	29.92
2	1,522	16.41
3	828	8.93
4	453	4.88
5	216	2.33
6	88	0.95
7	18	0.19
total	9,275	100

Frequency table for number of types of clubs participated in for the full sample.

Table 3: Frequency of supervisory responsibility variables

Degree of Responsibility	None	Some	Full
Responsible for pay setting	58.36	28.54	13.1
Responsible for determining promotions	41.52	42.35	16.13
Responsible for assigning tasks	5.9	40.16	53.94

This table provides the frequency with which supervisors report having no, some or full responsibility for each of the three actions listed above.

Table 4: Social skills and supervising

	Supervisor	Responsible For Pay	Responsible For Promotions	Sum of Responsibilities	Span of Supervision
Clubs	0.023**	0.012**	0.011**	0.096**	0.031†
	(0.0043)	(0.0029)	(0.0035)	(0.022)	(0.016)
Log firm size	-0.008**	-0.0049*	0.002	-0.0027	0.132**
	(0.0029)	(0.0021)	(0.0025)	(0.015)	(0.012)
Firm has multiple locations	0.02†	-0.013	0.011	0.045	0.187*
	(0.012)	(0.0089)	(0.01)	(0.062)	(0.047)
Married	0.038**	0.025**	0.021*	0.169**	0.046
	(0.011)	(0.0078)	(0.0094)	(0.058)	(0.044)
Union member	-0.16**	-0.096**	-0.101**	-0.716**	-0.199*
	(0.014)	(0.007)	(0.0098)	(0.078)	(0.07)
AFQT percentile	0.115**	0.075**	0.083**	0.496**	0.083
	(0.027)	(0.019)	(0.022)	(0.134)	(0.104)
Years of school	0.019**	0.013**	0.012**	0.078**	0.012
	(0.003)	(0.0021)	(0.0025)	(0.015)	(0.011)
Tenure	0.027**	0.0071**	0.007*	0.045**	0.0091
	(0.0033)	(0.0024)	(0.0029)	(0.017)	(0.013)
Tenure squared/100	-0.088**	-0.016	-0.02	-0.107	0.099
	(0.019)	(0.013)	(0.016)	(0.099)	(0.072)
Female	-0.079**	-0.032**	-0.041**	-0.313**	-0.283**
	(0.012)	(0.008)	(0.0096)	(0.06)	(0.046)
Black	-0.011	0.0056	0.013	0.04	-0.015
	(0.014)	(0.011)	(0.013)	(0.074)	(0.058)
Hispanic	0.019	0.026*	0.046**	0.209**	0.028
	(0.015)	(0.012)	(0.015)	(0.08)	(0.058)
R-Squared	0.0690	0.0986	0.0532	0.1221	0.0487
Observations	9,275	3,528	3,528	3,528	3,518
Individuals	5,681	2,534	2,534	2,534	2,529
Estimator	Probit	Ordered Probit	Ordered Probit	OLS	Tobit

Marginal effects with standard errors presented in columns 1-3; coefficient estimates with standard errors in columns 4-5.
Industry and year fixed effects included.

Table 5: Household fixed effects and instrumental variables estimates

Supervisory Status:	Probit	Household FE	IV	IV Statistics:	
Marginal Effect/Coefficient	0.023**	0.025**	0.016	Partial R-squared:	0.0626
Standard Error	(0.0043)	(0.0072)	(0.023)	Hansen J-statistic:	0.93 (.33)
R-squared	0.0690	0.053	--	Anderson Statistic:	337.9 (.00)
Observations	9,275	5,461	5,229		
Responsible for Pay:	Ordered Probit	Household FE	IV	IV Statistics:	
Marginal Effect/Coefficient	0.012**	0.0057	0.026	Partial R-squared:	0.0581
Standard Error	(0.0029)	(0.015)	(0.049)	Hansen J-statistic:	0.11 (.74)
R-squared	0.0986	0.1687	0.1661	Anderson Statistic:	120.2 (.00)
Observations	3,528	2,084	2,010		
Responsible for Promotions:	Ordered Probit	Household FE	IV	IV Statistics:	
Marginal Effect/Coefficient	0.011**	0.021	-0.0076	Partial R-squared:	0.0581
Standard Error	(0.0035)	(0.015)	(0.05)	Hansen J-statistic:	120.2 (.00)
R-squared	0.0532	0.2276	0.1153	Anderson Statistic:	0.21 (.65)
Observations	3,528	2,084	2,010		
Sum of Responsibilities:	OLS	Household FE	IV	IV Statistics:	
Coefficient	0.096**	0.093**	0.0039	Partial R-squared:	0.0605
Standard Error	(0.022)	(0.036)	(0.114)	Hansen J-statistic:	0.38 (.83)
R-squared	0.1221	0.3827	0.1352	Anderson Statistic:	124.5 (.00)
Observations	3,528	2,084	1,997		
Log number of supervisees:	Tobit	Household FE	IV	IV Statistics:	
Coefficient	0.031†	-0.027	0.152†	Partial R-squared:	0.0584
Standard Error	(0.016)	(0.019)	(0.081)	Hansen J-statistic:	0.001 (.98)
R-squared	0.0487	0.0703	0.151	Anderson Statistic:	120.5 (.00)
Observations	3,518	2,077	2,004		

Table presents coefficient estimates with standard errors in parentheses.
Industry and year fixed effects included.
Models include firm size and individual characteristics as covariates.
The estimates for the remaining independent variables are not included for the sake of brevity.

Table 6: summary statistics for school quality variables

	mean	std. dev.	obs.
School size	1,362	(7775.5)	6,604
Percent students disadvantaged	23.77	(23.71)	5,720
Percent average daily attendance	88.67	(14.72)	6,654
Percent students drop out 10th grade	15.83	(20.71)	6,476

Table presents summary statistics for the school quality variables.

Table 7: Supervisor estimates including school quality variables

Panel A: HFE estimates variable	Supervisor	Responsible For Pay	Responsible For Promotions	Sum of Responsibilities	Span of Supervision
Clubs	0.028**	0.011	0.037*	0.115**	-0.043†
	(0.0095)	(0.02)	(0.019)	(0.048)	(0.024)
Log school size	-0.053	0.031	-0.123	-0.257	-0.143
	(0.04)	(0.08)	(0.077)	(0.181)	(0.134)
Percent students disadvantaged	-0.00051	-0.0067*	-0.0097**	-0.023**	0.0019
	(0.0017)	(0.0033)	(0.0033)	(0.0077)	(0.0041)
Percent students drop out 10th grade	-0.0031**	-0.00013	-0.00044	-0.0028	0.00024
	(0.0008)	(0.0021)	(0.002)	(0.005)	(0.0032)
R-squared	0.0532	0.1692	0.2451	0.3761	0.0772
Observations	3,246	1,292	1,292	1,292	1,287

Panel B: IV estimates variable	Supervisor	Responsible For Pay	Responsible For Promotions	Sum of Responsibilities	Span of Supervision
Clubs	0.031	-0.015	-0.063	-0.109	0.17
	(0.0037)	(0.071)	(0.074)	(0.171)	(0.122)
Log school size	-0.055**	0.094**	0.058†	0.19*	0.091†
	(0.019)	(0.032)	(0.033)	(0.075)	(0.056)
Percent students disadvantaged	0.00081†	-0.00045	0.00068	0.0022	0.0014
	(0.00045)	(0.00098)	(0.001)	(0.0023)	(0.0017)
Percent students drop out 10th grade	-0.00049	-0.0017†	-0.00048	-0.0018	0.0019
	(0.00048	(0.00092)	(0.00098)	(0.002)	(0.0019)
1st stage partial R-squared	0.0468	0.0459	0.0459	0.0459	0.0454
Hansen J-statistic	2.98 (.08)	0.38 (0.54)	0.00 (1.0)	0.12 (.73)	0.57 (0.45)
Anderson statistic	148.7 (.00)	58.7 (.00)	58.7 (.00)	58.7 (.00)	57.9 (.00)
R-squared	--	0.1732	0.1162	0.1296	0.1494
Observations	3,104	1,249	1,249	1,249	1,245

Table presents coefficient or marginal effects estimates with standard errors in parentheses.
Each model is estimated using instrumental variables estimation.
Industry and year fixed effects included.
Models include firm size and individual characteristics as covariates.
The estimates for the remaining independent variables are not included for the sake of brevity.

Table 8: Household fixed effects estimates by type of club

	Academic	Non-Academic	Athletics
Supervisory Status:	0.035†	0.015	0.019
	(0.02)	(0.018)	(0.023)
Responsible for Pay:	0.084**	-0.069†	0.047
	(0.041)	(0.041)	(0.051)
Responsible for Promotions:	0.061	-0.029	0.086
	(0.045)	(0.041)	(0.054)
Sum of Responsibilities:	0.277**	-0.081	0.15
	(0.112)	(0.103)	(0.134)
Log number of supervisees:	-0.077	-0.065	0.096
	(0.056)	(0.048)	(0.059)

Table presents coefficient estimates with standard errors in parentheses.
Each model is estimated using household fixed effects estimation.
Industry and year fixed effects included.
Models include firm size and individual characteristics as covariates.
The estimates for the remaining independent variables are not included for the sake of brevity

Table A1: Exogeneity of instrumental variables

	Supervisor	Responsible For Pay	Responsible For Promotions	Sum of Responsibilities	Span of Supervision
Clubs	0.024**	0.023†	0.022†	0.089**	0.028
	(0.0059)	(0.013)	(0.013)	(0.03)	(0.021)
Siblings' clubs participation	-0.0045	0.0029	-0.01	-0.022	0.029
	(0.0063)	(0.013)	(0.014)	(0.032)	(0.022)
Indicator for regular religious attendance in 1979	0.011	-0.0086	0.0049	0.0057	0.032
	(0.014)	(0.031)	(0.032)	(0.073)	(0.051)
R-squared	0.0696	0.1662	0.1179	0.1388	0.1675
Observations	5,229	2,010	2,010	2,010	2,004

This table provides the coefficient or marginal effects estimates for the clubs variable and the instrumental variables when the latter are included in the model as explanatory variables.
Models include firm size and individual characteristics as covariates.
The estimates for the remaining independent variables are not included for the sake of brevity.