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"Social Isolation and Inequality"
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by

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Social Isolation and Inequality[*][†]

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Abstract

There is an increasing interest in the concept of social exclusion and the related concept of social isolation and their potential role in understanding inequality. We examine the degree to which voluntary separation from social activities during adolescence affects adult wages. It is well-known that participation in high school athletic programs leads to higher adult wages. We present empirical evidence that this premium is not primarily due to selection on predetermined characteristics valued in the labor market.

1. Introduction

There is increasing interest in the concept of social exclusion and its potential role in understanding inequality.[1] Barry (1998) discusses a similar concept, social isolation, which he defines as the phenomenon of non-participation in a society's institutions. Social exclusion is distinguished from social isolation in that the former refers to those cases in which an individual's non-participation is due to circumstances outside his or her control, while social isolation may result from an individual's voluntary choices.

That non-participation in society's institutions may be voluntary does not lessen the consequences. Understanding the differences among individuals that lead to differences in economic success is a central concern in economics. While the bulk of the work investigating the economic consequences of individual differences focuses on investment in education and on the intergenerational transfer of inequality, there is a literature that emphasizes the importance of "non-cognitive" skills such as social adaptability, motivation and self esteem (see, e.g., Heckman (2000)).[2] Our aim in this paper is to investigate the acquisition of non-cognitive skills that are valued in the labor force through voluntary participation in social activities. We take the point of view that while there may be some intrinsic differences among individuals in social adaptability and motivation, some of the differences arise from choices individuals make. In particular, we assume that individuals make choices about whether to engage in activities that are primarily social, by which we mean activities for which the primary goal is *not* the acquisition of marketable skills.[3] Participants will, however, accumulate skills that are valued in the labor market as a by-product of participation in the social activities.

A leading example of such activities are athletic programs for adolescents (or pre-adolescents). A miniscule fraction of the participants of little league baseball may go on to play professional baseball, but for the overwhelming majority, the baseball skills acquired have absolutely no market value. It is widely believed that participants nevertheless benefit in important ways; many believe that participants learn, among other things, discipline, the importance of hard work, and

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[1] See, e.g., Loury (2000) for a good discussion of the potential role of the concept in economics.

[2] Although the literature describes these skills as non-cognitive, the use of such skills may in fact involve cognition, i.e., the exercise of perception, thought and reason.

[3] Putnam *et al.* (1993) emphasizes the economic importance of participation in social activities; Putnam (2000) documents that decrease in such participation and the economic consequences of the decline. Our focus, however, is the effect on individuals of social isolation, rather than on the societal cost.

interpersonal skills.

Athletic programs are not unique among activities that are commonly thought to generate substantial benefits to participants, as evidenced by the fact that the admission committees of many universities put substantial weight on participation in drama clubs, school newspapers and yearbooks, and student government (among many such activities). An important pair of facts about such activities is that there is substantial variation in the degree to which young people participate in them, and there are large wage premia associated with participation. For example, in the U.S., 52% of white males participate in high school athletics, and conditional on family background and demographic variables, we will show that there is 20 – 25% adult wage premium associated with participation.

In light of substantial wage premia associated with participation in social activities, a natural question is whether exclusion from such activities – voluntary or otherwise – plays an important role in inequality. Any answer to this question requires thinking carefully about the decision of what activities (if any) individuals participate in, and how participation might influence adult wages. There is an obvious question of the predetermined characteristics of those who choose to participate in an activity. It may be that there is an unobservable characteristic, such as intelligence, that is associated both with participation and with higher adult wages. In this case, participating or not participating has no effect on the wage despite the correlation.

Even if participation is directly linked to the adult wage premium, inducing an individual to participate when he or she otherwise would not may not lead to that person's receiving the adult wage premium. It may be that the wage premia are due to increased self-esteem stemming from participation. Forcing an individual who can not sing to join the choir could conceivably lead to lower wages if this were the case.

We will argue that selection on predetermined characteristics valued in the labor market does not explain an important portion of the wage premium. Hence, unequal participation in these activities that lead to higher wages is a source of inequality. A full understanding of inequality requires an understanding of the consequences of uneven participation, whether it stems from voluntary choices or from external constraints.

Athletics is but one type of social participation that can have subsidiary economic consequences, and perhaps not the most important. A problem in considering other activities is that participation is often not "0-1"; one can gather with friends at the local Starbucks as frequently or infrequently as one wants. An

advantage of focusing on athletics as an activity is that participation, at least in school-organized athletic programs, is relatively well-defined. One has a regular practice schedule, and one is dropped from the activity if one deviates nontrivially from that schedule. Because of the relatively clear definition of whether an individual participates in an athletic program or not, there is greater consistency across people of what participation entails. We do believe, however, that there is a vast array of less well-defined activities that people participate in – or do not participate in – that are at least as important in producing the social skills that are valued in the market. The economic consequences of social isolation are, we believe, substantially greater than those identified in this paper.

We describe the data and the estimation results in the next section and discuss our results in a concluding section.

2. Empirics

As mentioned in the introduction, while our interest is in the effects of participation in a broad array of social activities we limit our attention in this paper to participation in athletic programs. We further restrict attention to participation of males in high school athletics.[4]

We provide indirect evidence suggesting that skills valued by the labor market are actually *acquired* from either participation or success in athletics. First we document the substantial adult wage premium associated with participation in high school athletics. Second, we investigate three potential sources of that premium: 1) skills acquired through participation, 2) selection on pre-existing, productive attributes, and 3) crowding out of negative activities. Determining whether the athlete wage premium reflects skills acquired through participation, rather than selection on pre-existing attributes or the crowding out of negative activities, is made difficult by the scarcity of measurable exogenous variation in the opportunities for, or costs of, participation.[5] Here we adopt two strategies to shed light on this question. The first strategy examines the relationship between participation in athletics and participation in negative activities, and whether

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[4]Restricting attention to males avoids an obvious problem of differences by gender in the way that the labor market values skills acquired through participation. This restriction also avoids the knottier problem of selection into the labor market for women. It would be interesting to carry out an analysis for females similar to our treatement of males.

[5]Stevenson (2003) uses the change in opportunties for athletics participation by females that resulted from the enactment of Title IX of the Educational Ammendments of 1972.

that relationship can explain the wage premium received by athletes. The second strategy uses an optimizing framework to generate predictions consistent with skills being acquired from participation in athletics.

2.1. The Athlete Wage Premium

Using data from the National Longitudinal Survey of Youth (NLSY), 1979 cohort we show first that there is a substantial wage premium associated with having been a high school athlete. The NLSY began, in 1979, with 12,686 men and women ages 14-21, and has interviewed this cohort every year until 1994, and every other year since then. In 1984, retrospective questions about participation in high school athletics were asked only of those who had finished or were expected to finish high school.[6] We restrict most of our attention to males who were 17 years old or younger when interviewed in 1980.[7] Table 1 compares the wages, measured in 1996 when these men were ages 31-33, of athletes and non-athletes, along with their demographic and family background characteristics.

This simple comparison shows a dramatic difference in the adult wages of athletes and non-athletes. Comparing the mean natural log of wages, those who participated in high school athletics earn approximately 26 percent more than those did not participate. Importantly, these athletes come from family backgrounds that are also significantly different. In particular, Table 1 shows that compared with non-athletes, those who participated in sports, on average, come from larger families with more educated parents who were more likely to have worked in skilled or professional occupations. Thus, a natural concern is that the disparities in the average adult outcomes of athletes and non-athletes derive from these differences in family background rather than any form of premium for athletics. Growing up in families with more human and financial capital, athletes may have an advantage on the labor market for reasons that have nothing to do with the fact that they played sports in high school.

To account for the influence of these systematic differences in family back-

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[6]That the question was asked only of those men who finished high school or planned to finish high school leads to sample selection. However, if as seems likely, those students who dropped out are less likely to have participated in athletics, and more likely to earn lower wages, this would bias downwards our estimates of any premium associated with athletic participation.

[7]This younger sample has the advantage that it was actually attending high school when it was asked questions about negative activities such as crime, drug use, and TV watching. Indeed, only these younger men were asked, in 1980, questions about certain negative activities such as skipping school and underage drinking.

ground, Table 2 presents OLS estimates of the relationship between participation in athletics and adult wages, controlling for a number of family characteristics. In Column 1, the first, simple regression of log wages on participation in athletics, age, region of current residence and urban/rural status of high school indicates that participation in high school athletics is associated with a 27 percent adult wage premium.[8] Adding controls for race and ethnicity in Column 2 leaves the estimated athlete wage premium essentially unchanged. Controlling for family characteristics including parents' education and occupation status, and number of siblings in Column 3, the coefficient on participation in athletics is reduced to 21 percent. Thus, these differences in family background account for only a modest portion of the disparity in wages between athletes and non-athletes.

Schools that offer more athletic programs, and therefore have more athletes, may also have better teachers, peers, and other resources and thus provide their students an advantage on the labor market. It is therefore possible that the athlete wage premium is, to some extent, a school quality premium. To investigate this possibility, we consider whether differences in measures of school quality such as school size, student-teacher ratio, disadvantaged student ratio, dropout rate and teacher turnover rate may explain the wage premium paid to athletes. Because many schools did not respond to the NLSY survey, a substantial portion of our younger male subsample (32%) is lost when we condition on these variables. Restricting attention to the remaining sample with sufficient data, Columns 4 and 5 of Table 2 present the effects of adding controls for measures school quality. We find that while these measures of school quality are associated with adult wages in the expected way, they are not responsible for the athlete premium. Introducing controls for school quality leaves the estimated effect of adult height on adult wages essentially unchanged.[9]

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[8]Baron, et al. (2000), using the NLSY estimate a conditional athletics premium ranging from statistical zero (in a two-stage least-squares estimation) to 29%, depending on the conditioning factors.

[9]One might worry that the higher wage for athletes is driven by a few professional athletes. This is not, however, the case. The maximum wage in our sample is $90 per hour in 1996 dollars, and 98% earn a wage less than $47 per hour. Trimming the top 2% of the wage distribution slightly increases our estimates of the athletic participation premium. Trimming both the highest and lowest 2% slightly reduces our estimates of the premium.

2.2. Athletics and Participation in Negative Activities

The previous subsection suggests that differences in the family backgrounds and schools of high school athletes explain only a modest amount of the advantage that these athletes enjoy in the labor market. Our thesis is that participation in athletic programs leads to the accumulation of skills valued in the labor market. A leading alternative explanation for the athlete premium is that athletes are more likely to possess, exogenously, unobservable attributes that have value in the labor market. For example, those endowed with a greater orientation toward the future (patience or discipline) may be more willing to practice their sport and thus trade time spent sleeping and watching TV for a position on a high school athletic team. Those with more patience may also be more likely to supply effort to a project at work in exchange for a later raise in pay. To the extent that such a correlation explains the athlete premium, the importance of participation in athletics for wage inequality would be limited. Athletes would do well in the labor market no matter what.

Alternatively, a common argument in support of high school athletics programs is that sports occupy time that would otherwise be spent pursuing negative activities. Simply by providing teenagers with relatively enjoyable opportunities to be under the supervision of adults, athletics may occupy time that would otherwise be spent in activities, such as doing drugs, having unprotected sex, or committing crime, that have long-term, negative consequences. Thus, rather than selecting teenagers with skills, or conferring skills on those who participate, athletics may instead crowd out negative behaviors.

To investigate whether the athlete wage premium reflects either selection on certain unobservable characteristics like future orientation, or the crowding out of negative activities, we explore the relationship between participation in high school athletics, participation in teenage activities such as truancy, unprotected sex, drug use, smoking, crime, and adult wages. Table 3 compares the tendencies of athletes and non-athletes to participate in various, seemingly negative teenage activities.[10] This simple comparison of means shows that high school athletes are significantly less likely to skip school, have unprotected sex, use marijuana or other drugs, be charged with a crime, watch television or smoke cigarettes. Among the seemingly negative activities we consider, athletes are only more likely to drink underage. To the extent that participation in these activities is correlated with negative unobservables such as impatience or impulsiveness, these comparisons suggest

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[10]Appendix A1 provides the precise definitions of these behaviors.

that athletes may be paid more not because they had participated in athletics, but rather because they are exogenously endowed with attributes valued by the labor market. Alternatively, to the extent that participation in these activities has long term negative consequences on wages, these comparisons suggest that athletes may be paid more because the time they spent playing sports kept them taking up these negative activities (the "crowding out" hypothesis).

Our data do not provide direct evidence of the correlation between unobservable characteristics such as impatience and participation in activities like truancy, unprotected sex, smoking and crime;[11] and we cannot provide direct evidence that these activities lower later productivity. We can, however, demonstrate that participation in these negative activities is associated with lower wages. Table 4, Columns 1-9 shows that participation in each of these activities is, when considered by itself, and net of differences in family background, negatively correlated with adult wages. When we condition on all of these choices simultaneously (Table 4, Column 10), we find that most are negatively associated with adult wages, and some significantly so. For example, using illegal drugs as a teenager is, conditional on family background and participation in the other seemingly negative activities, associated with a 12 percent adult wage penalty. Being charged with a crime while a teenager is associated with a 22 percent wage penalty. So while it is unclear whether participation in these activities actually diminishes productivity, or is merely correlated with traits that are penalized in the labor market, it is clear that most of these activities are associated with lower wages.

The central question then is to what extent the tendency for athletes to avoid such negative activities account, either through selection on productive traits or through the crowding out of negative behavior, for the athlete wage premium? If the wage premium is due to the crowding out of negative behaviors that adversely affect adult wages, we should see a substantial drop in the athlete wage premium when we control for the negative behaviors. That is, there should be little or no premium for those athletes who *did* engage in the negative behaviors. This is not the case, however. Table 5 shows the results from OLS estimates of the relationship between participation in athletics and adult wages, conditional on both family background and region, and on participation in negative activities. Column 1 of Table 5 presents the analogue of the estimate in Column 3 of Table 2

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[11]Fuchs (1982) shows that the rate of time preference, measured by answers to questions about hypothetical choices between a sum of money now and a larger sum at a specific point in the future, is positively correlated with smoking. Munasinghe and Sicherman (2001) and Della Vigna and Paserman (2003) also use some of these measures as proxies for impatience.

for the subsample for which we have data on participation in negative activities. Net of differences in family background and region, we find a 21 percent athlete wage premium in this subsample. Conditioning on participation in negative activities in Column 2, we find that the estimated relationship between participation in high school athletics and adult wages is only modestly diminished. Controlling for participation in negative activities, we estimate an 18 percent athlete wage premium. We view these results as suggesting that the athlete wage premium is largely not attributable to the crowding out of activities that have negative long-term effects on later wages.

Analogously, if the wage premium were due to selection on productive unobservables such as forward orientation that are correlated with making choices to delay gratification obtained from activities like sex, drugs and crime, controlling for negative behaviors should reduce the athlete wage premium. We thus interpret these results as consistent with a large part of the athlete wage premium not due to selection. The possibility remains, however, that participation in athletics is simply a much better correlate of these unobservables than is the avoidance of unprotected sex, cigarettes, and participation in crime.

A related concern is that the athletic wage premium reflects selection on productive traits such as cognitive ability. To address this concern, we examine whether the estimated athlete premium is substantially diminished when we control for cognitive ability as measured by an Armed Forces Qualifying Test (AFQT).[12] In Column 3 we present results analogous to the estimates from Column 2, but restricting attention to that subsample for whom we have an AFQT score. In Column 4, we add a control for the AFQT score, and find the athlete premium is diminished by an additional third to a still economically and statistically significant 12 percent premium.[13] Thus, conditioning on both participation in negative activities and on a measure of cognitive ability reduces the estimated athlete premium by approximately 45 percent. We interpret these results as consistent with a substantial portion of the athlete premium *not* being due to selec-

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[12]The AFQT is a vocational aptitude test. It reflects the scores from word knowledge, paragraph comprehension, math knowledge and arithmetic reasoning tests. The tests were administered as part of the NLSY in the summer and fall of 1980 when the respondents were ages 15-23. Thus, for some, the test reflects their achievement at or before the time they participated in high school athletics, while for others the test also reflects later achievement.

[13]If, in addition, we control for highest grade of schooling completed at various ages, the estimated athlete premium is essentially unchanged. If we control only for AFQT, family background and region, the estimated athlete premium is 13.8 percent.

tion on productive traits.[14] In summary, we view the evidence as consistent with the athlete wage premium not primarily resulting from selection on unobservable characteristics or from the crowding out of negative behaviors. Rather, the results suggest that participation in athletics may have an economically substantial, *direct* influence on later wages.

2.3. Inference From Optimizing Choices

We argued in the previous section that the evidence suggests that a substantial portion of the athlete wage premium is due to a direct effect of participation in athletics. Why, then, don't *all* students participate if there is an adult wage premium for doing so? What accounts for two individuals indistinguishable (to the econometrician) making different decisions about participation? For participation in athletic programs, there is a constraint on the number of participants. The number of people who are on an athletic team is limited both by resources available and by interschool regulations. Typically, a number of students will try out for a sport, with those who are less good at the sport dropping out, voluntarily or involuntarily. When students can forecast, even imperfectly, those students with greater athletic ability will naturally be more likely to participate.

There are now two possibilities. First, athletic ability is not by itself associated with higher adult wages, in which case the athlete wage premium arises from participation. Alternatively, athletic ability *is* correlated with attributes that are valued in the labor force, in which case participation may not directly affect adult wages. For example, it might be that students may signal that they have strong motivation and discipline by participating in athletics. We will argue that the former is the case.

Suppose that those with greater athletic ability are also those with greater *pre-existing* skills valued by the labor market. Then, in a school where participation in athletics is more competitive, the selected group of athletes will be of higher ability than those selected in a school where participation is less competitive. Thus to the extent that the athletics participation premium is due to selection on pre-existing skills, the wages of athletes in competitive schools should, on average, be higher than those of athletes in less competitive schools.

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[14]It is also possible that participation in athletics directly or indirectly increases cognitive ability. For example, participation might produce greater effort in school, and consequently increase cognitive ability. The results in Columns 3 and 4 suggest that a substantial portion of the athlete wage premium is not generated in this way.

In the U.S., the rate of participation in athletics is, as expected, decreasing in the population of the school. For example, using data from the NLSY, we find that male students attending schools of above median size are 9 percentage points (18 percent) less likely to participate in athletics than those attending smaller schools.[15] (See Table 6, Column 1.) This result is consistent with competition for positions on teams being higher at larger schools.[16] If competition for places on teams is higher at larger schools, and if there is monotone selection on pre-existing ability valued by the labor market, we would expect athletes at larger schools to 1) have higher ability and 2) be associated with greater wage premia than those at smaller schools.

We look for evidence of these effects of increased competition at larger schools in two ways. First, we examine whether athletes at larger schools have higher relative levels of skills valued by the labor market than athletes at smaller schools. Specifically, we examine the relationship between the AFQT scores of those participating in athletics by size of school. AFQT scores are particularly interesting because the skills they measure are valued in the labor market.[17] We find no evidence that the athletes in more competitive schools have more of the skills reflected in AFQT scores than athletes at less competitive schools. If anything, the results in Table 6, Column 2 suggest that athletes at larger schools may have *lower* AFQT scores than those at smaller schools. The point estimates indicate that participation in athletics is associated with an AFQT score that is 11 percentile points higher at smaller schools, but only 9 points higher at larger schools. These results are consistent with larger schools having athletics programs that are more competitive, and yet no more selective on pre-existing skills valued by the labor market. An alternative interpretation is that in schools where athletics is more competitive, more time must be spent practicing in order to participate, leaving less time for scholastic work that improves AFQT scores. Consistent with

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[15]This result conditions on the region and urban-rural status of the school, as well as on the age and family background of the student.

[16]Futher evidence in support of greater competition at larger schools is found in the variation in high school sports programs by state. Using data from the National Federation of State High School Associations, we find that in states with, on average, larger high schools, the fraction of high schools offering various boys sports programs is only somewhat larger. For example, conditional on region, an increase in the size of a state's average high school by 100 students is associated with an increase in the probability that the school offers a boys football program by just 6 percent. Similar results hold for each of the 10 most popular sports, except for wrestling where in states with larger schools the schools are considerably more likely to offer the sport.

[17]See Neal and Johnson (1996), for example.

these results, we estimate that athletes in larger schools receive only a modestly larger wage premium for participation than those in smaller schools (see Table 6, Column 3). Participation in athletics is associated with a 17.1% adult wage premium in smaller schools and a 22.5% premium in larger schools. This difference is not statistically significant.[18]

Another possibility is that the athlete wage premium is not a premium to skills acquired through participation but rather, an unmeasured academic premium that is caused by parent- or school-imposed academic requirements for participating in athletics.[19] We address this possibility in two ways. First we simply note that the unmeasured academic performance must be net of achievement on the AFQT test taken in 1980 near the end of the high school career. Second, while data on academic performance in addition to AFQT are limited, we do have class percentile for a small subsample of our data. Table 7 shows the results of including this direct measure of academic performance to estimates of the athletic wage premium. For this subset of the data, AFQT and class percentile appear to proxy for very similar skills; each is positively associated with wages but, conditional on the other, neither independently explains much additional variation in wages. More directly, for this subsample we find (a) conditional on academic performance (class percentile) there is a substantial athlete premium, (b) its estimate is little influenced by adding controls for negative behaviors. In other words, our qualitative conclusions are robust to the inclusion of additional measures of academic performance. We interpret this result as consistent with the athlete premium not merely representing a mismeasured academic premium.

We view these results as further evidence that valuable skills are acquired through participation in, or success at, athletics. Our claim is not that the athletics participation premium reflects no selection on pre-existing skills. There could be, for example, other skills that are valued in the adult labor market that were orthogonal to those measured by AFQT, but correlated with athletic participation. Our results, however, show that selection is unlikely to provide a complete explanation for the athletics wage premium.

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[18]Each of these results is robust to analysis that restricts attention to the younger sample that was in high school when it took the AFQT. The results are also robust to adding the controls for school quality used in Table 2 (student teacher ratio, disadvantaged student ratio, dropout rate and teacher turnover rate). Adding these controls rules out the possibility that school size is proxying for school quality.

[19]We thank the editor for pointing out this possibility.

3. Discussion

1. *Related literature.* Our examination of whether selection effects are driving the athlete wage premium is related to that in Barron, et al. (2000) in two ways. First, Barron, et al. also make use of variation in school enrollment to draw inference about the athlete premium. In that paper, school size along with measures of the student's health, height, weight, family income, geographic location, and school quality, are used as instruments for athletic participation. We, like Barron et al., are skeptical of the instrumental variables assumption that school size is associated with wages only through its effect on participation in athletics. Therefore, instead of instrumenting for athletics with school size, we draw inference about the implications for selection on other observables (AFQT) of large schools having more competitive athletics teams. Second, Barron, et al., also consider whether differences in time preferences may explain the athlete premium. They look for evidence of selection on this characteristic in the wages, and in the education and labor supply decisions of athletes versus non-athletes. We take a different approach and argue that unobservables such as a taste for leisure or impatience should be reflected not only in the decision to participate in athletics but also in the decision to participate in activities characterized by immediate gains and long term expected costs. We then investigate whether participation in these "negative" activities can explain the athlete premium.

Stevenson (2003) provides supporting evidence that athletic participation generates benefits. Stevenson uses a "natural experiment" to distinguish between the hypothesis that seeming benefits from participation stem from selection and the hypothesis that athletics generates direct benefits. In 1972 the U.S. Congress enacted Title IX of the Educational Amendments, which essentially banned gender discrimination in federally funded schools. For all practical purposes, Title IX required schools to equalize (at least approximately) the athletic participation rates of males and females. Female participation rates increased more than sixfold over the next six years. States were allowed some time to come into compliance, and there was substantial variation in the compliance rates. Stevenson uses this mandated increase to estimate that athletic participation generates an increase in educational attainment of approximate one quarter of a year and more than a ten percent increase in the probability of being employed.

Our work differs from Stevenson's in several ways. First, we focus on males while her work focuses on females, since they were more affected by Title IX. Also, prior to Title IX many schools did not offer athletic programs for women,

and consequently, this was not an avenue through which women differentially accumulated the noncognitive skills that might account for differential treatment later in life. Lastly, Stevenson analyzes the effect of athletic participation on educational attainment, while the aim of this paper is to investigate the effects of participation on income.

2. *The social activity.* Our broad interest is in the benefits of social integration and the costs of nonintegration. Individuals sometimes do not participate in social activities, despite the benefits that flow from participation. We focused on participation in athletic programs, but students can also participate in a large number of other activities, including student government, yearbook, school newspaper, and dramatics. Participation in such high school clubs is associated with economically significant adult wage premia, although smaller than the athlete premium: the effect on adult wages of participating in a high school club is approximately one third of the effect of participating in athletics (Persico, Postlewaite and Silverman (2004)). We mentioned above that we focus on high school athletics because participation in athletics is typically more structured than participation in many of these other high school activities. Participating in a drama club may involve many hours of interaction with other participants during rehearsals and performances, but it may also involve nothing more than collecting tickets for a few hours. Participation in athletics, on the other hand, normally requires at minimum, many hours of regular practice. Given the looser definition of participation in these other high school activities, it should not be surprising that the effect of such participation on adult wages is less than participation in athletics.

The difficulty of distinguishing selection into these activities based on attributes valued by the labor market from accumulation of skills stemming from participation is more difficult for high school clubs than for athletics, because the strategy that we employed for distinguishing these for athletic programs would be less compelling here. There is a small number of sports available in high school and a limited number of students who can participate in each of them, but there is no limit to the number of clubs that can be formed, nor to the number of participants in them. Consequently, one should not necessarily expect that if students were selecting into clubs on the basis of attributes valued in the labor market, we would see a stronger relationship between participation and adult wages at large schools than at small schools.[20]

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[20]In fact we find that students in large schools participate in slightly fewer clubs on average, though this relationship is not statistically significant (results not shown). As with athletics, though the point estimate is consistent with clubs at big schools being more competitive, we see

If we assume that as with athletics, participation in these activities leads to the accumulation of skills valued in the labor market, it is surprising that many students do not participate despite the return from doing so. Physical considerations such as size, height or coordination may constrain some students from participating in athletics even if they were willing to do so. Most of the nonathletic activities do not have an exogenous constraint on total participation, and physical considerations are presumably less important than for athletics, and nonparticipation in clubs is probably voluntary.

The logic of the individual optimization that determined who participated in athletic programs described above can readily be extended to the choice of participation in other clubs. Suppose there is a "social ranking" of students in a particular school that is independent of characteristics that affect adult wages; some adolescents are "cool" while others are nerds, geeks or losers. Those who are cool are easily accepted by others and treated well, while those who are not are treated with disdain; this differential social treatment leads to different returns to individuals of different social rank.[21] All individuals may incur the same effort and time cost to participate and enjoy the same expected adult wage premium associated with participation, but the differences in the social treatment can lead to different participation decisions.

In summary, differential social treatment can, not surprisingly, lead to different choices about participation. Even when the abilities that affect how well a student does at an activity (speed or singing ability, for example) are not directly valued in the labor market, differential participation will affect relative adult wages, because participation *per se* affects wages.

no stronger relationship between participation in clubs and adult wages at large schools than at small schools.

[21]This is reminiscent of Esteban and Ray (1994).

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Table 1: Adult Wages, Demographic and Family Background Characteristics, by Participation in Athletics, for Younger Males in the NLSY

	Ln(wage) in 1996	Age in 1996	Black	Hispanic	Mother's education	Mother professional	Father's education	Father professional	No. of siblings	N
Non-Athlete	2.34 (0.030)	32.97 (0.037)	0.21 (0.019)	0.18 (0.018)	10.84 (0.13)	0.04 (0.009)	10.51 (0.158)	0.06 (0.011)	2.62 (0.113)	486
Athlete	2.60 (0.028)**	33.03 (0.037)	0.23 (0.019)	0.12 (0.015)**	12.02 (0.12)**	0.11 (0.014)**	12.35 (0.150)**	0.14 (0.016)**	3.06 (0.099)**	479

Notes: Sample consists only of males who were less than 18 years old at their interview in 1980, and working full-time in 1996. Parents are identified as professional if they work in a professional/managerial occupation.

Table 2: Relationship Between Adult Wages and Participation in Athletics, for Younger Males in the NLSY

Covariates	(1)	(2)	(3)	(4)	(5)
	Dependent Variable: Ln(Wage) in 1996				
Athlete	0.267 (0.041)	0.266 (0.040)	0.209 (0.042)	0.213 (0.055)	0.214 (0.056)
Age	0.0181 (0.024)	0.009 (0.023)	0.011 (0.023)	-0.011 (0.030)	-0.034 (0.029)
Black		-0.341 (0.054)	-0.261 (0.059)	-0.339 (0.085)	-0.326 (0.086)
Hispanic		-0.163 (0.063)	-0.046 (0.071)	-0.050 (0.096)	-0.055 (0.095)
Mother's years of schooling			0.021 (0.011)	0.016 (0.014)	0.012 (0.014)
Mother skilled/ Professional			- 0.018 (0.087)	-0.002 (0.108)	- 0.001 (0.106)
Father's years of schooling			0.007 (0.008)	0.005 (0.011)	0.003 (0.011)
Father skilled/ professional			0.143 (0.067)	0.148 (0.084)	0.149 (0.082)
Number of siblings			-0.024 (0.009)	-0.021 (0.011)	-0.023 (0.011)
School population (100s)					0.011 (0.004)
Student/teacher ratio					-0.005 (0.009)
Disadvantaged student ratio					-0.001 (0.0012)
Dropout rate					-0.002 (0.001)
Teacher turnover rate					-0.002 (0.004)
N	965	965	965	656	656
Adjusted R^2	0.062	0.103	0.130	0.109	0.126
F-Statistic (K,N-K-1)	12.23	14.02	12.80	7.41	6.76

Standard errors robust to heteroskedasticity are in parentheses.
Notes: Sample consists only of males who were less than 18 years old at their interview in 1980, and working full-time in 1996. Each specification includes controls for region, urban/rural status of high school and a constant term, results omitted.

	Skipped school	Drank underage	Sex in last month	Unprotected sex in last month	Smoked marijuana	Used other drugs	Charged with a crime	Hours of TV	Smoked a cigarette	N
Table 3: Participation in Negative Teenage Activities, by Participation in Athletics, for Younger Males in the NLSY										
Non-Athlete	0.47 (0.023)	0.63 (0.023)	0.51 (0.023)	0.17 (0.018)	0.43 (0.023)	0.17 (0.018)	0.13 (0.016)	13.81 (0.64)	0.42 (0.022)	455
Athlete	0.42 (0.023)	0.72 (0.021)**	0.53 (0.023)	0.12 (0.015)**	0.38 (0.023)*	0.11 (0.015)**	0.07 (0.012)**	12.04 (0.55)**	0.30 (0.021)**	456

Notes: Sample consists only of males who were less than 18 years old at their interview in 1980, working full-time in 1996, and for whom data exists on each of the negative activities. See Table A1 for variable descriptions.

Table 4: Relationship Between Adult Wages and Participation Negative Teenage Activities, for Younger Males in the NLSY

Covariates	Dependent Variable: Ln(Wage) in 1996									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Skipped school	-0.106 (0.042)									-0.043 (0.045)
Drank underage		-0.023 (0.048)								0.054 (0.051)
Sex in last month			-0.039 (0.044)							0.037 (0.047)
Unprotected sex in last month				-0.085 (0.062)						-0.053 (0.066)
Smoked marijuana					-0.087 (0.044)					0.017 (0.050)
Used other drugs						-0.200 (0.062)				-0.116 (0.067)
Charged with a crime							-0.288 (0.079)			-0.217 (0.084)
Hours of TV								-0.0014 (0.0015)		-0.0018 (0.0014)
Smoked a cigarette									-0.214 (0.043)	-0.175 (0.047)
N	911	911	911	911	911	911	911	911	911	911
Adjusted R^2	0.103	0.097	0.097	0.099	0.101	0.107	0.114	0.097	0.121	0.131
F-Statistic (K,N-K-1)	9.45	9.23	9.36	9.30	9.38	9.78	10.54	9.44	10.24	7.67

Standard errors robust to heteroskedasticity are in parentheses.

Notes: Sample consists only of males who were less than 18 years old at their interview in 1980, and working full-time in 1996. Each specification includes controls for age, race, ethnicity, family background, region, urban/rural status of high school and a constant term, results omitted. See Table A1 for variable descriptions.

Table 5: Relationship Between Adult Wages and Participation in Athletics and Participation in Negative Teenage Activities, for Younger Males in the NLSY

	Dependent Variable: Ln(Wage) in 1996			
Covariates	(1)	(2)	(3)	(4)
Athlete	0.212 (0.042)	0.175 (0.043)	0.174 (0.044)	0.117 (0.043)
Skipped school		-0.043 (0.045)	-0.046 (0.045)	-0.017 (0.044)
Drank underage		0.027 (0.051)	0.022 (0.052)	-0.004 (0.050)
Sex in last month		0.026 (0.047)	0.032 (0.047)	0.066 (0.047)
Unprotected sex in last month		-0.036 (0.065)	-0.042 (0.066)	-0.043 (0.064)
Smoked marijuana		0.028 (0.050)	0.031 (0.050)	0.020 (0.048)
Used other drugs		-0.100 (0.067)	-0.094 (0.068)	-0.081 (0.066)
Charged with a crime		-0.201 (0.084)	-0.192 (0.085)	-0.161 (0.084)
Hours of TV		-0.0016 (0.0015)	-0.0013 (0.0015)	-0.0010 (0.0015)
Smoked a cigarette		-0.159 (0.046)	-0.164 (0.046)	-0.117 (0.045)
AFQT Percentile				0.0067 (0.0009)
N	911	911	901	901
Adjusted R^2	0.121	0.146	0.145	0.195
F-Statistic (K,N-K-1)	10.63	8.24	8.04	9.81

Standard errors robust to heteroskedasticity are in parentheses.
Notes: Sample consists only of males who were less than 18 years old at their interview in 1980, and working full-time in 1996. Each specification includes controls for age, race, ethnicity, family background, region, urban/rural status of high school and a constant term, results omitted. See Table A1 for variable descriptions.

	Table 6: The Relationship Between School Size, Participation in Athletics, and Adult Wages for Males in the NLSY		
	Dependent Variable		
	Participation in HS Athletics	AFQT Percentile 1980	Ln(wage) 1996
Covariates	(1)	(2)	(3)
Participation in HS Athletics	…	11.07 (1.58)	0.171 (0.0441)
Attend a big school	-0.090 (0.0252)	2.32 (1.60)	0.066 (0.0441)
(Athlete) x (Big school)		-2.30 (2.15)	0.054 (0.0582)
Urban school	-0.066 (0.0300)	2.91 (1.351)	0.072 (0.0385)
N	1861	1861	1861
R^2	0.049	0.400	0.145

Standard errors robust to heteroskedasticity are in parentheses.
Notes: Sample consists only of males, who were working full-time in 1996. Each specification includes controls for age, race, region, mother's and father's education and occupation, number of siblings, and a constant term, results omitted. Specification (1) presents the average marginal effects from a probit estimation. Specifications (2) and (3) are OLS

Table 7: Relationship Between Adult Wages and Participation in Athletics and Participation in Negative Teenage Activities, for Younger Males in the NLSY, Conditioning on High School Class Percentile

	Dependent Variable: Ln(Wage) in 1996		
Covariates	(1)	(2)	(3)
Athlete	0.139 (0.062)	0.120 (0.0624)	0.092 (0.062)
AFQT Percentile	0.0069 (0.0012)	0.0050 (0.0012)	0.0050 (0.0012)
Class Percentile		-0.011 (0.0041)	-0.009 (0.004)
Skipped school			0.044 (0.068)
Drank underage			-0.035 (0.065)
Sex in last month			0.080 (0.066)
Unprotected sex in last month			-0.048 (0.089)
Smoked marijuana			-0.024 (0.073)
Used other drugs			0.043 (0.113)
Charged with a crime			-0.284 (0.185)
Hours of TV			-0.0047 (0.0026)
Smoked a cigarette			-0.118 (0.067)
N	396	396	396
Adjusted R^2	0.154	0.171	0.181
F-Stat. (K,N-K-1)	5.52	5.40	5.00

Standard errors robust to heteroskedasticity are in parentheses.
Notes: Sample consists only of males who were less than 18 years old at their interview in 1980, and working full-time in 1996. Each specification includes controls for age, race, ethnicity, family background, region, urban/rural status of high school and a constant term, results omitted. See Table A1 for variable descriptions.

Table A1: Negative Activity Variable Descriptions		
Variable name	Description	Survey Year
Skipped School	Skipped a full day of school without a real excuse in the past year	1980
Drank underage	Drank beer, wine or liquor without parents' permission in the past year	1980
Sex in last month	Had sex in the month prior to interview	1983
Unprotected sex in last month	Had sex in the month prior to interview, and did not always do something to prevent pregnancy.	1983
Smoked marijuana	Smoked marijuana or hashish in the past year	1980
Used other drugs	Used any drugs or chemicals to get high or for kicks, except for marijuana	1980
Charged with a crime	Ever been booked or charge for breaking a law, either by police or by someone connected with the courts	1980
Hours of TV	Hours spent watching TV in the 7 days prior to the interview	1981
Smoked a cigarette	Smoked at least one cigarette within the 30 days prior to the interview	1984