Do high school sports build or reveal character? Bounding causal estimates of sports participation

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**Abstract**

We examine the extent to which participation in high school athletics in the United States has beneficial effects on future education, labor market, and health outcomes. Due to the absence of plausible instruments in observational data, we use recently developed methods that relate selection on observables with selection on unobservables to estimate bounds on the causal effect of athletics participation. We do not find consistent evidence of individual education or labor market benefits. However, we do find that male (but not female) athletes are more likely to exercise regularly as adults, but are no less likely to be obese.

1. Introduction

Participating in sports is a cultural rite of passage for adolescents in many countries, including the United States. According to the National Federation of State High School Associations (NFHS), in the US, 7.9 million high school students (56%) play some kind of sport. Sports participation has also trended upward over time, and participation in sports organized by high schools has increased steadily over the past 25 years (National Federation of State High School Associations, 2017).

Given widespread participation in sports, it is natural to ask if the benefits outweigh the costs, both to individual athletes and to schools. While potential benefits of sports participation on long-term individual outcomes have been widely publicized (Dick’s Sporting Goods, 2017), participating in athletics may be costly for individual students by taking time away from academic pursuits (Coleman, 1961) or increasing injury risk (Fair & Champa, 2017). Moreover, maintaining athletic programs is a non-trivial cost for schools—so much so that athletic programs are being dropped from an increasing number of school districts. It is estimated that 27% of public high schools will have no athletic programs by the year 2020 (Dick’s Sporting Goods, 2017; Up 2 Us Sports, 2017). This is a particularly surprising trend in light of the continued growth in the number of students participating.

The primary question amid the debate of whether to maintain funding for high school athletics is whether or not athletic participation benefits students in line with the purposes of schools. That is, does participation enhance human capital of students in ways that will improve their lives, as opposed to simply providing an enjoyable recreational activity? We add our analysis to a large number of previous studies that have used observational data to also investigate this question. The primary empirical approach in existing studies has been to either assume that athletes are randomly assigned, or to use instrumental variables or quasi-experimental policy changes to estimate a plausibly causal effect. We take a different approach by instead asserting that, outside of one-time large-scale policy changes, no plausibly exogenous instruments exist. Instead, we make use of recently developed econometric methods that relate selection on observables with selection on unobservables to bound the causal effects of participation in high school sports (see also Altonji, Elder, & Taber, 2005b; Krauth, 2016; Millimet & Tchernis, 2013; Millimet, Tchernis, & Husain, 2010; Oster, 2017).

The econometric method we utilize in our analysis is developed by Krauth (2016) and allows researchers to empirically test the extent of the benefits of sports participation on long-term individual outcomes.
deviations from exogeneity in a linear model with univariate treatment. Specifically, this method puts bounds on the correlation between the policy variable and the unobservable characteristics relative to the correlation between the policy variable and observable characteristics. We implement the method as a sensitivity analysis to include the case where sports participation is correlated with the error term in the outcome equation.

Athletic participation is strongly positively correlated with a number of outcomes—including high school graduation, college attendance, college graduation, wages, exercise habits, and absence of obesity—but we find that this correlation is almost completely due to selection. For most of the outcomes that we consider, we find that even if the correlation between athletic participation and unobservable characteristics is a small fraction of the correlation between athletic participation and observable characteristics, then there is no effect of sports. Across several different outcomes and different samples, we find no consistent benefits from high school sports. However, in a few cases that we discuss below, we do find statistically significant effects from sports participation that are arguably causal.

We analyze three separate nationally representative longitudinal surveys that link athletic participation in high school with future individual outcomes such as post-secondary education, labor market earnings, health, and propensity to engage in risky behaviors. The three surveys are the National Longitudinal Survey of Youth, 1979 (NELS:88); and the National Longitudinal Study of Adolescent to Adult Health (Add Health). Each of these studies has been used previously by researchers to analyze effects of high school sports, but no study has jointly analyzed all three.¹

Our primary contributions are three-fold: (i) to assess the sensitivity of previous causal claims using recently developed econometric methods; (ii) to document the impact of sports participation on health and behavioral outcomes in addition to education and labor market outcomes; and (iii) to examine heterogeneity in the effects by gender.

Our generally null results inform the policy debate on high school participation and observable characteristics, then there is no effect of sports participation on health. Across several different outcomes and different samples, we find no consistent benefits from high school sports. However, in a few cases that we discuss below, we do find statistically significant effects from sports participation that are arguably causal.

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