Why Do We Play? The Effect of Youth Sports Participation on Future Earnings

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Background

By playing sports at a young age, those children develop soft skills earlier and more aggressively than their non-sport playing counterparts. This theory is supported by work across disciplines that suggest playing youth sports has a positive effect on cognitive development, social skills, and work ethic. The logic behind this is if children playing sports give them more skills, making them more valuable workers, and increasing their marginal product of labor which is result in them demanding a higher wage. This can be tested for by running a regression between the effects of sports participation on wage with controls from the dataset such a race, sex, industry, marital status, health, and education from a cohort of children's data from the NLSY79 Children and Young Adults dataset.

Current Literature

- There is not a lot of literate specifically for the economic value playing sports creates for an individual.
- In a study titled "Sports and Child Development" by Christina Felfe, Michael Lechner, and Andreas Steinmayr researchers found that playing sports leads to children who perform better in school.
- A similar paper by Edward Foy Moore titled "A Comparison of Work Ethic Among High School Athletes and Non-Athletes" found that children who played sports scored higher in work ethic assessments.
- A study by Paul D Loprinz titled "Benefits and Environmental Determinants of Physical Activity in Children and Adolescents" examined many different ways children get physical activity, including in school activities like physical education classes and after school actives such as organized sports. This study found that some activities are more effective in promoting growth for children than others, specifically that activities requiring socialization were better.
- A study titled "Can sport really help to meet the Millennium Development Goals? Evidence from children in Peru" by Tim Pawlowski, Ute Schüttoff, Paul Downward, and Michael Lechner examined the effects of playing sports on child development in a developing country, which found minimal effects.
- A cognitive study titled "Sports Participation & Childhood Neurocognitive Development" by Fu-Miao Tan. Junhong Yu, and Alicia M. Goodwill which found children who did play sports were more cognitively developed than those who did not play sports.

Theory

The first part of the theory was to determine how children decide to play sports. Assuming children are rational actors with some level of agency in how they spend their time, they would want to maximize their utility in what they do. Each utility function represents a fixed amount of utility, with each point along the time representing a combination of the two goods, in this case an hour playing sports and an hour of doing all other activities, that would yield that much utility. These same individuals are forced into a budget constraint with a fixed amount that can be spent, especially when talking time.

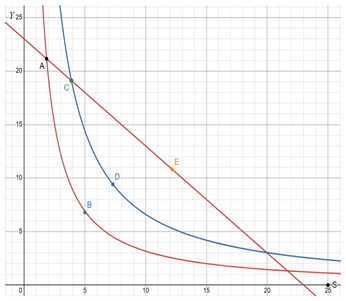

Figure 1- Optimizing Utility Functions on a Budget Constraint

The second part is determining why, if playing sports increases work ethic, that would have a positive effect on wages. This can be explained using the marginal product of labor model. The employer gets to determine the wage they pay. They want to make sure that the price of another hour of paying wages, the marginal product of labor, is less than or equal to the amount that can be earned from having that same worker work another hour. If a worker is more productive they would have a higher marginal product of labor. Their higher marginal product of labor would allow them to demand a higher wage from their employer. A worker with a high work ethic will be more efficient. They will be able to use their time to achieve more while at work.

Regression

$$log(Wages_{phirm}) = \beta_0 + \beta_1 SportsParticipation_p + \zeta_h + \gamma_i + I_r + \beta_2 Sex + \delta_m + \beta_3 Education_p + \epsilon_{phirm}$$

This regression is looking at the wages of person p, who has a health status of h, works in industry i, is race r, and marital status m. In my regression, ζ_h represents health fixed effects, γ_i represents the industry fixed effects, I_r represents the industry fixed effects, and finally δ_m represents the marital status fixed effects

VARIABLES	logwages
Sports Participation	0.199***
	-0.0655
Black	-0.178**
	-0.0839
Non-Hispanic, Non-Black	0.103
	-0.0769
Female	-0.164**
	-0.0645
Utilities and Construction	-0.127
	-0.249
Manufacturing and Trades	-0.158
	-0.23
Transportation and Warehousing	-0.292
	-0.279
Finance, Real Estate, and Information	0.125
	-0.247
Professional, Scientific, and Technical Services	0.215
	-0.249
Management, Support, and Waste Management Services	-0.133
	-0.249
Educational Services	-0.119
	-0.249
Health Care and Social Assistance	-0.142
	-0.239
Arts, Entertainment, and Recreation	-0.201
	-0.284
Accommodations and Food Services	-0.429*
	-0.243
Other Services (Except Public Administration)	-0.450*
	-0.256
Public Administration and Military	0.578**
	-0.265
Last Saw a Doctor 1 - 3 Months Ago	0.237*
	-0.129
Last Saw a Doctor 4 - 6 Months Ago	0.189
	-0.126
Last Saw a Doctor 7 - 11 Months Ago	0.282**
	-0.136
Last Saw a Doctor 1 year - 23 Months Ago	0.116
	-0.121
Last Saw a Doctor 2 or More Years Ago	0.214*
	-0.123
Has Never Seen a Doctor	-0.247
	-0.218
Married	0.176**
	-0.0689
Never Married	-0.251
	-0.272
Divorced	0.209
	-0.174
Did Graduate High School	0.347**
	-0.145
Constant	9.584***
	-0.294
Observations	984
R-squared	0.133

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Table 1- Regression with Controls

Kernel Density Graphs

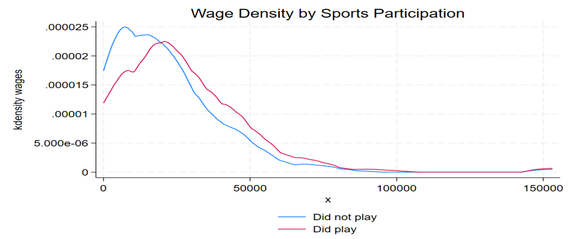

Figure 2- Wage Density by Sports Participation

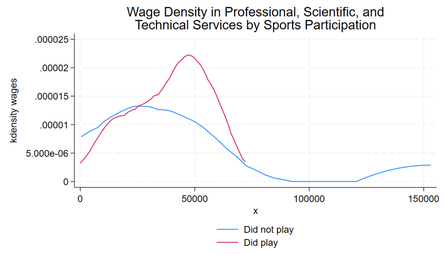

Figure 3- Wage Density in Professional, Scientific, and Technical Services Industry

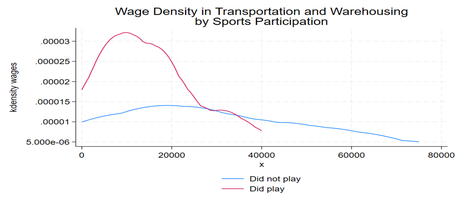

Figure 4- Wage Density in Transportation and Warehousing Industry

Oster Test

- One of the biggest concerns of this study is the relatively low R^2 value.
- This fear can be alleviated by the work from Emily Oster titled "Unobservable Selection and Coefficient Stability: Theory and Evidence" (Oster, 2019)
- Her work she develops a method for evaluating robustness to omitted variable bias (Oster, 2019).
- She does this by examining how the coefficient and R^2 values change as controls are added to the regression (Oster, 2019).
- This allows researchers to determine what R^2 value they wish to achieve and by providing the regression with and without controls it can estimate the potential coefficient and the robustness of the omitted variables (Oster, 2019).
- This allows researchers to estimate the effects of omitted variables and predict new coefficients if they were to have been able to add the necessary controls to their regression.
- She suggests setting the new R max value to the R^2 times 1.3.

R max	Delta	Beta
0.173	5.76179	0.17372
0.3	1.58672	0.08350
0.5	0.74107	-0.08892
1	0.31773	-0.75821

Table 3- Oster Tests

- The R max of 0.173 would suggest a coefficient is robust to omitted variable bias. With a delta of 5.76179, the unobserved variables would have to be 5.76179 times stronger than the observed variables to eliminate the effect of sports participation on wages.
- The beta is also 0.17372, which is only 0.026 lower than the coefficient from the regression. Which would suggest the findings to be valid that sports participation has a positive effect on wages.
- The R max up to 0.3 those findings stand, as the delta is still over one but the beta, 0.08350, is now 0.1155 lower than the coefficient from the regression with controls.
- Once the R max is 0.5, the Oster test would suggest some flaws in the findings. The delta is now below one, but only slightly at 0.74107 while the coefficient now becoming negative.
- When the R max is set to one, the delta is minuscule at 0.31773 and the beta is -0.75821.

Future Work

- What leads to athletes having higher earnings
- Is there a difference in earnings between individual or team sport athletes
- A comprehensive study where researchers randomly select kids to pay for their sporting activities and compare their outcomes to other kids in the area without having their sports paid for

Summary of Findings

- The regression shows that there is a suggestive causal relationship between youth participation in sports and their wages. This could be explained with multiple explanations, potentially due to intangible skills that individuals acquire and develop through participating in youth sports
- The regression showed that those who participated in youth sports earned 19.9% more than those who did not participate in youth sports
- Some industries showed the opposite of the findings from the regression, such as the transportation and warehousing industry and the professional, scientific, and technical services industries
- The Oster test showed the lower R^2 is a concern but conclusions can still be made from this study, as it validated the results from the regression at lower R max values
- While this study does not prove anything conclusive, it does show suggestive evidence of a strong, positive relationship between participation in youth sports and the wages that individual will earn

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