Childhood Sporting Activities and Adult Labour-Market Outcomes

Charlotte Cabane ¹ and Andrew E. Clark ²

¹ SEW - University of St. Gallen
² Paris School of Economics

April 2013
Practising sport favours labour-market success.

- Human capital: higher level of individual productivity;
- Positive signal (on a Curriculum vitae);
- Networking effect;
Practising sport favours labour-market success.

- Human capital: higher level of individual productivity;
- Positive signal (on a Curriculum vitae);
- Networking effect;

Human capital: higher level of individual productivity:

1. health: Lechner (2009), Felfe et al. (2011)
2. non-cognitive skills endowment:
   - specific personal traits: experimental economics Celse (2011), Eber (2002);
Practising sport favours labour-market success.

- Human capital: higher level of individual productivity;
- Positive signal (on a Curriculum vitae);
- Networking effect;

Positive signal (on a CV):


2. Signalling effect in a broad sense: Rooth (2010), Lechner (2009), Corneliessen & Pfeifer (2008), American studies;
Practising sport favours labour-market success.

- Human capital: higher level of individual productivity;
- Positive signal (on a Curriculum vitae);
- Networking effect;

Networking effect:

- Sport is a way to enlarge and diversify networks.
Practising sport favours labour-market success.

- Human capital: higher level of individual productivity;
- Positive signal (on a Curriculum vitae);
- Networking effect;

Research question

Does childhood sports participation impact adults' labour-market outcomes?
Contributions of our paper

1. Sample:
   - representative and younger sample;

2. Information on sporting practice:
   - frequency of sport participation (per week) in middle or high school,
   - type of sport,
   - sports’ club membership at school (effective or scheduled);

3. Various labour-market outcomes (13 years after):
   - yearly wage, job satisfaction, autonomy, managerial responsibilities;

4. Treatment of the endogeneity:
   - siblings comparison.
Team (individual) sports practised by high school boys (girls) is related to adult labour market success 13 years later;

Controlling for other extra-curricular activities does not cancel the existence of these correlations;

The effect is gender specific and higher for older (and more educated) schoolchildren;

No evidence of the existence of a threshold or a zero-sum game.

Within siblings:

- positive and significant impact for boys,
- negative and significant impact on wage and level of satisfaction at work for twin girls.
# Table of contents

1. **Introduction**

2. **Data**
   - Overview
   - Sport
   - Job quality

3. **Empirical framework**
   - Empirical strategy
   - Simplest estimation
   - Deepening the relationship

4. **Accounting for endogeneity**
   - Individuals’ skills, behavior and capacities
   - Individuals’ environment

5. **Conclusion**
Add Health data is a nationally representative sample of adolescents in grades 7 – 12 in the United States during the 1994 – 95 school year.

Our sample:

- Wave 1 (1994 – 1995): 7 to 12 grade, 144 schools, 4 questionnaires, 20,745 students, information on sports participation;

⇒10,500 individuals, schoolchildren in wave 1, currently working adults in wave 4.
“During the past week, how many times did you
● play an active sport, such as baseball, softball, basketball, soccer, swimming, or football?”
⇒ “team sport”
● did you do exercise, such as jogging, walking, karate, jumping rope, gymnastics or dancing?”
⇒ “individual sport”

“Here is a list of clubs, organizations, and teams found at many schools. Darken the oval next to any of them that you are participating in this year, or that you plan to participate in later in the school year.”
Information on sport - Wave 1

1. “During the past week, how many times did you
   - play an active sport, such as baseball, softball, basketball, soccer, swimming, or football?”
   ⇒ “team sport”
   - did you do exercise, such as jogging, walking, karate, jumping rope, gymnastics or dancing?”
   ⇒ “individual sport”

2. “Here is a list of clubs, organizations, and teams found at many schools. Darken the oval next to any of them that you are participating in this year, or that you plan to participate in later in the school year.”

Stylized facts:
- more than the half participate at least 3 times in sports, weekly (except girls, only one third in team sports),
- sporty children are younger, more likely to be boys, with more educated parents, with higher grades and then, with more success in the labour market.
Four labour-market outcomes

Is childhood sport participation related to:

1. Wage: yearly wage (information on the hours worked), yearly mean: women - 32,452$, men - 43,214$, log of the yearly wage (weighted by the number of hours worked).

2. Managerial responsibilities: the individual supervises at least one employee; 41% of men, 32% of women, dummy variable;
Four labour-market outcomes

Is childhood sport participation related to:

1. Wage:
   - Yearly wage (information on the hours worked),
   - Yearly mean: women - 32452$, men - 43214$,
   - Log of the yearly wage (weighted by the nb of hours worked).
Is childhood sport participation related to:

1. wage:
   - yearly wage (information on the hours worked),
   - yearly mean: women - 32452$, men - 43214$,
   - log of the yearly wage (weighted by the nb of hours worked).

2. managerial responsibilities:
   - the individuals supervises at least one employee,
   - 41% of the men are manager, 32% of the women,
   - dummy variable;
Four labour-market outcomes - contd

3. freedom to make important decisions in one’s job (autonomy)

<table>
<thead>
<tr>
<th>autonomy</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>8.6</td>
<td>24</td>
<td>32.4</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>Women</td>
<td>9.6</td>
<td>27</td>
<td>35.7</td>
<td>27.7</td>
<td>100</td>
</tr>
</tbody>
</table>

• ordered variable;
freedom to make important decisions in one’s job (autonomy)

<table>
<thead>
<tr>
<th>autonomy</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>8.6</td>
<td>24</td>
<td>32.4</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>Women</td>
<td>9.6</td>
<td>27</td>
<td>35.7</td>
<td>27.7</td>
<td>100</td>
</tr>
</tbody>
</table>

ordered variable;

satisfaction at work:

scale: 0 = extremely dissatisfied to 4 = extremely satisfied,
more than 73% of our sample is -at least- very satisfied at work,
ordered variable;
Empirical strategy

★ Simplified version:

- *time consistency*: schoolchildren sports participation in middle/high school (wave 1) i.e. 13 years prior to labour-market integration (wave 4),
- *accounting for intermediary effects*: covariates influenced by sports participation (wave 4): health status, education (level and type), work experience, number of children;
- other covariates: *gender*, ethnicity, age squared, education level of the most educated parent (wave 1);
Empirical strategy

★ Simplified version:

- *time consistency*: schoolchildren sports participation in middle/high school (wave 1) i.e. 13 years prior to labour-market integration (wave 4),

- *accounting for intermediary effects*: covariates influenced by sports participation (wave 4): health status, education (level and type), work experience, number of children;

- other covariates: *gender*, ethnicity, age squared, education level of the most educated parent (wave 1);

Deepening the relationship:

- existence of a threshold? relative or absolute participation frequency?
- do other extra-curricular activities matter?
Empirical strategy - contd.

- Accounting for endogeneity:
  1. due to omitted variables: use of the maximum of information with respect to individuals’ skills and capacities (ability, feelings and reciprocal friendship);
  2. due to family education and environment unobservable confounders: compare siblings (Ashenfelter and Krueger 1994).

Notes:
- Sample selection: individuals who are employed in Wave 4. (downward bias)
- Samples used when accounting for endogeneity dramatically diverge from the one used in the simplified estimations.
Empirical strategy - contd.

* Accounting for endogeneity:

1. due to omitted variables: use of the maximum of information with respect to individuals’ skills and capacities (ability, feelings and reciprocal friendship);

2. due to family education and environment unobservable confounders: compare siblings (Ashenfelter and Krueger 1994).

Notes:

- Sample selection: individuals who are employed in Wave 4. (downward bias)
- Samples used when accounting for endogeneity dramatically diverge from the one used in the simplified estimations.
Simplest estimation - Basic results

\[ \text{Job Quality}_{i,W4} = \varphi(\text{SPORT}_{i,W1}, \text{X}_{k,i,W4}) \]

with \( X \) being a vector of variables of control
Simplest estimation - Basic results

\[ \text{Job Quality}_i, w_4 = \varphi(\text{SPORT}_{i,w_1}, X_{k,i,w_4}) \]

with \( X \) being a vector of variables of control

- No evidence of the existence of school fixed effect;
- No evidence of an impact of the working sector;
- No need to belong to a school sports club to have her sports participation \textit{rewarded} 13 years later.
Simplest estimation - Basic results

\[ \text{Job Quality}_{i,w4} = \varphi(\text{SPORT}_{i,w1}, \text{X}_{k,i,w4}) \]

with \( X \) being a vector of variables of control

- No evidence of the existence of school fixed effect;
- No evidence of an impact of the working sector;
- No need to belong to a school sports club to have her sports participation rewarded 13 years later.

Estimations run by type of school attended in wave I
⇒ positive significant and sizeable correlations on the high school sub-sample:
  - different time constraint in high school,
  - high school schoolchildren are closer to the labour market (CV, networks),
⇒ From now on we focus on high school sub-sample.
For men, practising active sports once more per week while in high school is significantly associated with an increase:
- in the probability of being a manager of 2%,
- in the probability of having the maximum level of autonomy of 1%.

For women, practising individual sports once more per week is associated with:
- an increase in the probability of being a manager of 2%,
- an increase of the probability of having the maximum level of autonomy of 1.1%.

⇒ Different type of sport by gender.
Deepening the relationship - Specifying sports participation

Threshold in sporting activities frequency?

- use of 4 dummies instead of a continuous variable of frequency

⇒ No sharp pattern: no threshold and even no penalty for non-sporty people.
Deepening the relationship - Specifying sports participation

Threshold in sporting activities frequency?

- use of 4 dummies instead of a continuous variable of frequency

⇒ No sharp pattern: no threshold and even no penalty for non-sporty people.

Absolute or relative investment?

- Absolute measure of sports participation versus relative ones (with respect to age, gender and school):
  1. Normalized rank within groups,
  2. Position with respect to the average.

⇒ It is not a zero-sum game, no evidence of the existence of a signaling effect, neither reputation effect.
Deepening the relationship - Other activities

“During the past week, how many times did you...

- ... do hobbies, such as collecting baseball cards, playing a musical instrument, reading, or doing arts and crafts?” = hobbies
- ... just hang out with friends?” = friends
Deepening the relationship - Other activities

“During the past week, how many times did you...

- do hobbies, such as collecting baseball cards, playing a musical instrument, reading, or doing arts and crafts?” = hobbies
- just hang out with friends?” = friends

<table>
<thead>
<tr>
<th>MANAGER</th>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>basic</td>
<td>comparison</td>
</tr>
<tr>
<td>ind. Sport</td>
<td>-0.005</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>team sport</td>
<td>0.019***</td>
<td>0.019***</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>friends</td>
<td>0.008</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>hobbies</td>
<td>-0.006</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>tv</td>
<td>0.006</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Nb. Obs.</td>
<td>1907</td>
<td>1907</td>
</tr>
</tbody>
</table>

Controlling for other activities doesn’t cancel neither lower the coefficient associated to sport participation.
Men : controlling for other activities doesn’t cancel neither lower the impact of sport participation ;

Women : the coefficient is slightly smaller and active friendship does matter.
3 sets of variables for 3 hypothesis:

**Hyp 1:** according to Lévy-Garboua, Lohéac and Fayolle (2006), dissatisfaction at school leads to risky behaviours

Introduction of an indicator of satisfaction at school (subjective information on feelings at school);

**Hyp 2:** sporty schoolchildren have higher ability

Introduction of an indicator of grades in Mathematics, Science, English and History in wave 1;

**Hyp 3:** popularity index network formation

Introduction of an indicator of reciprocity of friendship or best-friendship (subjective information).
Controlling for happiness at school, ability and popularity:

- Dramatic reduction of the sample size (and selection issue).
- Results remain robust when they were significant before controlling (being a manager for men).
- No significant impact of sports participation for women belonging to this sub-sample.
- Significant control variables:
  - friendship for girls,
  - grades for boys.
Hyp : by comparing sporty to non-sporty people, we may select people who have a higher endowment in social capital and also a favourable environment.

- Estimation of the difference in labour market outcomes between siblings. (Ashenfelter and Krueger 1994)

\[ \Delta \text{Job Quality}_{i,j,w4} = \varphi(\Delta \text{SPORT}_{i,w1}, \Delta X_{k,i,w4}) \]

with \( X \) being a vector of variables of control (education, age -being the oldest-, work experience, health).

Note : 5 types of pairs of siblings : all, half and full siblings (H & S), only full siblings (Full), twins, only identical twins (id. twins).
The sample of pairs of siblings is significantly different from the original one:

1. younger people
   - sportier
   - less likely to attend high school in W1
   - (and then lower level in education in W4),
   - ⇒ lower impact of sports participation

2. larger proportion of black people,
   ⇒ potential over-investment in sports (Anderson 2000)

3. less healthy,

4. lower labour-market outcomes.

⇒ Results are expected to be more reliable but less significant, less sizeable and downward biased.
<table>
<thead>
<tr>
<th></th>
<th>Mixed pairs</th>
<th></th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Full</td>
<td>id. twins</td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>0.083</td>
<td>0.113*</td>
<td>-0.022</td>
</tr>
<tr>
<td></td>
<td>-0.051</td>
<td>-0.065</td>
<td>-0.19</td>
</tr>
<tr>
<td>Dif team sport</td>
<td>-0.070</td>
<td>-0.040</td>
<td>-0.286*</td>
</tr>
<tr>
<td></td>
<td>-0.050</td>
<td>-0.067</td>
<td>-0.153</td>
</tr>
<tr>
<td>Obs.</td>
<td>702</td>
<td>458</td>
<td>98</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.15</td>
<td>0.164</td>
<td>0.138</td>
</tr>
</tbody>
</table>

|                  | Mixed pairs |          | Girls          |
|                  | All         | Full     | id. twins      |
| Dif ind. sport   | 0.084*      | 0.114*   | -0.058         |
|                  | -0.050      | -0.065   | -0.188         |
| Dif team sport   | -0.063      | -0.036   | -0.271*        |
|                  | -0.051      | -0.069   | -0.162         |
| Dif friends      | -0.065      | -0.056   | 0.053          |
|                  | -0.060      | -0.073   | -0.201         |
| Dif hobbies      | 0.013       | -0.003   | 0.231          |
|                  | -0.048      | -0.066   | -0.139         |
| Dif TV           | -0.010      | 0.028    | 0.233          |
|                  | -0.063      | -0.102   | -0.196         |
| Obs.             | 702         | 458      | 98             |
| $R^2$            | 0.152       | 0.166    | 0.165          |
### Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Mixed pairs</th>
<th></th>
<th>Boys twins</th>
<th>Girls id. twins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H &amp; F</td>
<td>Full</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>-0.018</td>
<td>-0.042</td>
<td>-0.058</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>-0.027</td>
<td>-0.03</td>
<td>-0.054</td>
<td>-0.090</td>
</tr>
<tr>
<td>Dif team sport</td>
<td><strong>0.054</strong></td>
<td><strong>0.056</strong></td>
<td><strong>0.179</strong></td>
<td><strong>-0.154</strong></td>
</tr>
<tr>
<td></td>
<td>-0.027</td>
<td>-0.034</td>
<td>-0.073</td>
<td>-0.083</td>
</tr>
<tr>
<td>Obs.</td>
<td>610</td>
<td>492</td>
<td>176</td>
<td>106</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mixed pairs</th>
<th></th>
<th>Boys twins</th>
<th>Girls id. twins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H &amp; F</td>
<td>Full</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>-0.011</td>
<td>-0.033</td>
<td>-0.070</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>-0.028</td>
<td>-0.031</td>
<td>-0.059</td>
<td>-0.090</td>
</tr>
<tr>
<td>Dif team sport</td>
<td><strong>0.060</strong></td>
<td><strong>0.063</strong></td>
<td><strong>0.192</strong></td>
<td><strong>-0.152</strong></td>
</tr>
<tr>
<td></td>
<td>-0.027</td>
<td>-0.036</td>
<td>-0.076</td>
<td>-0.083</td>
</tr>
<tr>
<td>Dif friends</td>
<td>-0.003</td>
<td>0.002</td>
<td>-0.113*</td>
<td>-0.056</td>
</tr>
<tr>
<td></td>
<td>-0.033</td>
<td>-0.034</td>
<td>-0.059</td>
<td>-0.078</td>
</tr>
<tr>
<td>Dif hobbies</td>
<td>-0.038</td>
<td>-0.050</td>
<td>0.075</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>-0.028</td>
<td>-0.033</td>
<td>-0.054</td>
<td>-0.124</td>
</tr>
<tr>
<td>Dif TV</td>
<td>-0.020</td>
<td>-0.009</td>
<td>-0.080</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>-0.035</td>
<td>-0.041</td>
<td>-0.081</td>
<td>-0.098</td>
</tr>
<tr>
<td>Obs.</td>
<td>610</td>
<td>492</td>
<td>176</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Same sex</td>
<td>Mixed pairs</td>
<td>Boys</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------</td>
<td>-------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H &amp; F</td>
<td>Full</td>
<td>H &amp; F</td>
<td>Full</td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>0.004</td>
<td>0.004</td>
<td>0.013*</td>
<td>0.014*</td>
</tr>
<tr>
<td></td>
<td>-0.006</td>
<td>-0.006</td>
<td>-0.007</td>
<td>-0.009</td>
</tr>
<tr>
<td>Dif team sport</td>
<td>0.013**</td>
<td>0.013*</td>
<td>0.007</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>-0.007</td>
<td>-0.008</td>
<td>-0.009</td>
<td>-0.010</td>
</tr>
<tr>
<td>Obs.</td>
<td>1,032</td>
<td>890</td>
<td>610</td>
<td>492</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Same sex</th>
<th>Mixed pairs</th>
<th>Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H &amp; F</td>
<td>Full</td>
<td>H &amp; F</td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>0.003</td>
<td>0.003</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>-0.006</td>
<td>-0.007</td>
<td>-0.007</td>
</tr>
<tr>
<td>Dif team sport</td>
<td>0.011</td>
<td>0.011</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td>-0.007</td>
<td>-0.008</td>
<td>-0.010</td>
</tr>
<tr>
<td>Dif friends</td>
<td>0.011**</td>
<td>0.016**</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>-0.005</td>
<td>-0.007</td>
<td>-0.008</td>
</tr>
<tr>
<td>Dif hobbies</td>
<td>0.012*</td>
<td>0.012*</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>-0.006</td>
<td>-0.007</td>
<td>-0.008</td>
</tr>
<tr>
<td>Dif TV</td>
<td>-0.001</td>
<td>0.005</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>-0.007</td>
<td>-0.008</td>
<td>-0.009</td>
</tr>
<tr>
<td>Obs.</td>
<td>1,032</td>
<td>890</td>
<td>610</td>
</tr>
</tbody>
</table>
## Autonomy

<table>
<thead>
<tr>
<th></th>
<th>Same sex</th>
<th></th>
<th>Boys</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H &amp; F</td>
<td>Full</td>
<td>H &amp; F</td>
<td>Full</td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>0.009</td>
<td>-0.002</td>
<td>0.022</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>-0.019</td>
<td>-0.021</td>
<td>-0.034</td>
<td>-0.037</td>
</tr>
<tr>
<td>Dif team sport</td>
<td>0.042**</td>
<td>0.049**</td>
<td>0.083**</td>
<td>0.078*</td>
</tr>
<tr>
<td></td>
<td>-0.021</td>
<td>-0.023</td>
<td>-0.041</td>
<td>-0.046</td>
</tr>
<tr>
<td>Obs.</td>
<td>1 030</td>
<td>888</td>
<td>472</td>
<td>416</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dif ind. sport</td>
<td>0.007</td>
<td>-0.006</td>
<td>0.025</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>-0.020</td>
<td>-0.021</td>
<td>-0.035</td>
<td>-0.036</td>
</tr>
<tr>
<td>Dif team sport</td>
<td>0.037*</td>
<td>0.046*</td>
<td>0.076*</td>
<td>0.074</td>
</tr>
<tr>
<td></td>
<td>-0.022</td>
<td>-0.024</td>
<td>-0.044</td>
<td>-0.050</td>
</tr>
<tr>
<td>Dif friends</td>
<td>-0.003</td>
<td>-0.012</td>
<td>0.018</td>
<td>0.024</td>
</tr>
<tr>
<td></td>
<td>-0.025</td>
<td>-0.028</td>
<td>-0.043</td>
<td>-0.048</td>
</tr>
<tr>
<td>Dif hobbies</td>
<td>0.050**</td>
<td>0.060**</td>
<td>0.055*</td>
<td>0.070**</td>
</tr>
<tr>
<td></td>
<td>-0.021</td>
<td>-0.024</td>
<td>-0.032</td>
<td>-0.032</td>
</tr>
<tr>
<td>Dif TV</td>
<td>0.048</td>
<td>0.045</td>
<td>0.069</td>
<td>0.069</td>
</tr>
<tr>
<td></td>
<td>-0.033</td>
<td>-0.035</td>
<td>-0.049</td>
<td>-0.050</td>
</tr>
<tr>
<td>Obs.</td>
<td>1 030</td>
<td>888</td>
<td>472</td>
<td>416</td>
</tr>
</tbody>
</table>
Team (individual) sports practised by high school boys (girls) is related to adult labour market success 13 years later;

Controlling for other extra-curricular activities does not cancel the existence of these correlations;

The effect is gender specific and higher for older (and more educated) schoolchildren;

No evidence of the existence of a threshold or a zero-sum game.
Conclusion - contd.

For the sibling who practised the most frequently sport during her childhood, controlling for other activities, the participation in...

1 team sports has a positive and significant impact:
   - on the level of satisfaction within mixed pairs and twin boys pairs,
   - on the level of autonomy within same sex pairs and pairs of boys;

2 individual sports has a positive and significant impact:
   - on the wage within mixed pairs,
   - on the probability of being a manager within pairs of boys;

3 team sports has a negative and significant impact on wage and level of satisfaction within pairs of identical twin sisters.
Conclusion - contd.

For the sibling who practised the most frequently sport during her childhood, controlling for other activities, the participation in...

1 team sports has a positive and significant impact:
   - on the level of satisfaction within mixed pairs and twin boys pairs,
   - on the level of autonomy within same sex pairs and pairs of boys;

2 individual sports has a positive and significant impact:
   - on the wage within mixed pairs,
   - on the probability of being a manager within pairs of boys;

3 team sports has a negative and significant impact on wage and level of satisfaction within pairs of identical twin sisters.

⇒ No evidence of a causal relationship between childhood sports participation and adults labour-market outcomes.

Intuition: sportier boys have a greater endowment in non-cognitive skills (prior to sports participation OR thanks to sports participation) which leads them to be more successful on the labour-market.
Thank you very much for your attention!
Appendix

Using instrumental variable  Hyp : the older sibling bargains with the parents (the sports participation), and her “unobservables” are different from her sibling’s “unobservables”. (Kosteas 2010)

- Instrumented variable : childhood sports’ participation of individual $i$,
- Instruments : childhood (individual / active) sports’ participation of individual $j$, $i$’s older sibling,
- Sample : only pairs and no twins, no distinction by gender neither by type of school.
Using instrumental variable Hyp: the older sibling bargains with the parents (the sports participation), and her “unobservables” are different from her sibling’s “unobservables”. (Kosteas 2010)

- Instrumented variable: childhood sports’ participation of individual $i$,
- Instruments: childhood (individual / active) sports’ participation of individual $j$, $i$’s older sibling,
- Sample: only pairs and no twins, no distinction by gender neither by type of school.

<table>
<thead>
<tr>
<th></th>
<th>ind. sport</th>
<th>active sport</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV ind. sport</td>
<td>0.712***</td>
<td>-0.207***</td>
</tr>
<tr>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>IV active sport</td>
<td>-0.179***</td>
<td>0.792***</td>
</tr>
<tr>
<td>(0.019)</td>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1474</td>
<td>1474</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.37</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%
**Table:** Estimates with and without instrumentation.

<table>
<thead>
<tr>
<th></th>
<th>Basic</th>
<th>IV S2</th>
<th>IV S3</th>
<th></th>
<th>Basic</th>
<th>IV S2</th>
<th>IV S3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WAGE</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>MANAGER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ind. sport</td>
<td>0.006</td>
<td>-0.002</td>
<td></td>
<td>0.048**</td>
<td>0.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.044)</td>
<td></td>
<td>(0.021)</td>
<td>(0.032)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>team sport</td>
<td>-0.038</td>
<td>-0.082**</td>
<td>-0.006</td>
<td>-0.024</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.035)</td>
<td>(0.020)</td>
<td>(0.028)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1412</td>
<td>1412</td>
<td>1412</td>
<td>1474</td>
<td>1474</td>
<td>1474</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.122</td>
<td>0.116</td>
<td>0.115</td>
<td>-945.13</td>
<td>-3694.81</td>
<td>-3674.64</td>
<td></td>
</tr>
<tr>
<td><strong>AUTONOMY</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>SATISFACTION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ind. Sport</td>
<td>0.020</td>
<td>0.039</td>
<td></td>
<td>0.012</td>
<td>0.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.022)</td>
<td></td>
<td>(0.015)</td>
<td>(0.021)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>team sport</td>
<td>0.021</td>
<td>-0.011</td>
<td>-0.007</td>
<td>-0.026</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.024)</td>
<td>(0.015)</td>
<td>(0.021)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1473</td>
<td>1473</td>
<td>1473</td>
<td>1474</td>
<td>1474</td>
<td>1474</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.036</td>
<td>0.033</td>
<td>0.027</td>
<td>0.063</td>
<td>0.063</td>
<td>0.060</td>
<td></td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%