

Labour market effects of individual sports activities

Michael Lechner

Swiss Institute for Empirical Economic Research (SEW),
University of St. Gallen

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Research question

- > Does individual (active) participation in sports lead to 'better' labour market outcomes?
- > Potential mechanisms
 - Sports as investment in health (Grossman) → better health → higher wage
 - (Team) sports leading to better social skills
 - Sports improves self-discipline
 - Youth sports: More time spent in sports is less time available for crime etc.

Today's lecture

- > Paper on labour market effects of adults
 - brief overview only
- > Paper on effects of cognitive and non-cognitive skills of children
 - work in progress

Long-run labour market and health effects of individual sports activities

Michael Lechner*

Journal of Health Economics 28 (2009) 839–854



> Basic idea

- Use long panel of adults to investigate the effects of sports participation over a long time horizon (up to 15 years)

> Selection problem

- Individuals with better chances on the labour market self-select into sport activities

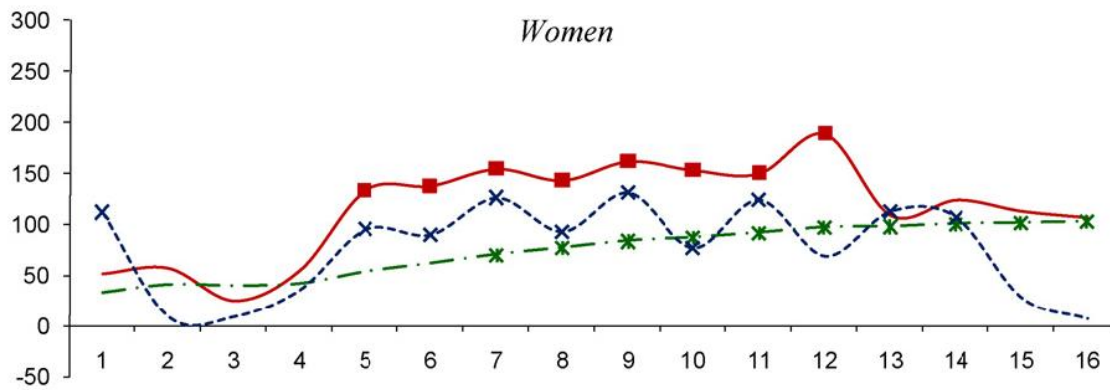
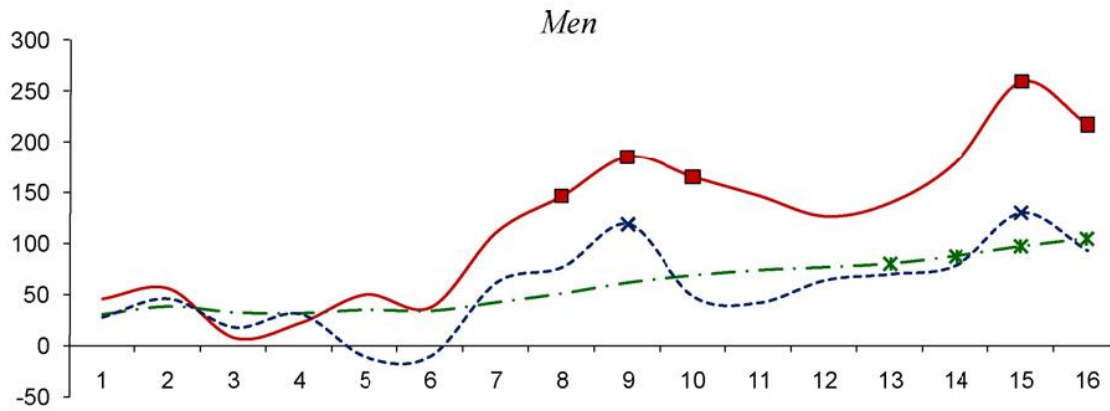
> Try to get reliable identification by

- exploiting panel structure
- use semiparametric matching methods



Adults: Key results (1)

M. Lechner / Journal of Health Economics 28 (2009) 839–854



Key results (2)

- > About 5% higher earnings due to sports (100 EUR)
- > Unlikely that this effect comes only via the health channel

Key shortcomings

- > Sports very crudely measured
 - only intensity, not type of sports
 - no measure of other physical activities
- > Sample size not really large
- > Analysis of channels not really convincing

- > Next paper investigates human capital and social capital channel in more details
 - ➔ Relevant group for these channels: Kids!



The impact of sports activities on children's development

Michael Lechner

Swiss Institute for Empirical Economic Research (SEW),
University of St. Gallen

Coauthors: Christina Felfe & Andreas Steinmayr

1st draft just completed

Introduction

Research question

- > *What is the effect of sports participation on human capital development of younger children?*

- > What we know so far ...
 - Positive relationship between participation in high school sports and educational attainment & labor market outcomes
(Long & Caudill, 1991; Meloney & McCormick, 1993; McCormick & Tinsley, 1987; Eide and Ronan, 2001; Pfeifer and Cornelissen, 2010; Rees and Sabia, 2010; Stevenson, 2010)

- > *Where does the educational attainment come from?*
 - Health?
 - Additional human and social capital?
 - What about younger kids?

Introduction

The paper in a nutshell (1)

- > Use a cross-sectional (medical) survey for Germany as data base
- > Employ matching methods to estimate the effects of sports (in clubs) on various outcome variables
 - Drawback: Remaining selection bias?

Introduction

The paper in a nutshell (2)

- > Further methods to increase robustness and credibility
 - Semiparametric IV methods to improve credibility of results
 - Instrument: Distance to next sports facility
 - Drawback: *Additional sampling uncertainty leads to test of low power*
 - Use second data set for additional robustness checks
 - 'Kinderpanel': Smaller, but panel structure allows more convincing research design

Introduction

The paper in a nutshell (2)

- > Positive effects on cognitive and non-cognitive skills
- > Positive effects on health and well-being
- > Interesting (non-) heterogeneity
 - Effects in city more important than for country side
 - Not much gender difference
 - no age effect visible
 - social status of parents (*not yet completed*)

Introduction

Our intended contributions (1)

- > *Convincing estimate of effect of sports participation on cognitive and non-cognitive skills* (without experiment)
- > Focus on the early part of the life cycle (age 3-10)
 - Period during which skills are most malleable (Heckman et al. ...)
- > Analyze several 'channels' through which sport may exert its effect on human capital
 - *Non-cognitive skills*
 - Health
 - Well-being

Introduction

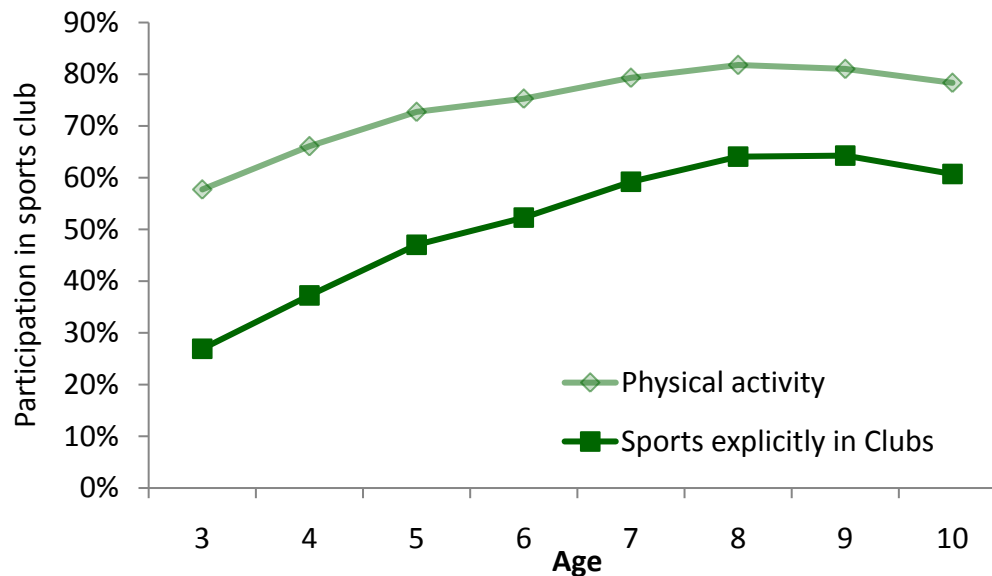
Our intended contributions (2)

- > Focus on sports clubs participation, not on general physical activity
 - Sport in clubs has also a pedagogical & competitive component
 - Less measurement error due to socially desired answers from parents
- > Tackle the non-random-selection-into-sports problem by
 - controlling for a set of informative confounders
 - using *distance to sports facilities* as an IV
 - use second, smaller panel data set to see whether results are robust when are more credible research design is used

Introduction

Background: The role of sports clubs for the physical activity of kids

- > Clubs play an important role in kids and youth sports in Germany
 - 76% (boys), 59% (girls) in the age group 7-14 years according to DOSB
- > Participation rates in sports (outside school) in Germany by age



Source: German Health Interview & Examination Survey for Children and Adolescents

Introduction

Background: The role of sports clubs for the physical activity of kids

- > Kids and Youth sports in Germany is heavily organized in clubs
 - 76% (boys), 59% (girls) in the age group 7-14 years according to DOSB
- > Favourite sports conditional on being in a club

Boys

soccer (45%)

gymnastics (14%)

tennis (5%)

handball (5%)

athletics (5%)

Girls

gymnastics (37%)

soccer (11%)

horse riding (8%)

athletics (7%)

swimming (6%)

Data

KiGGS (1)

- > German Health Interview & Examination Survey for Children & Adolescents (KIGGS)
 - Covers 17,641 children age 0-17 surveyed between 2003-2006
 - Cross section
 - Info on children's health (objective) & (non-)cognitive abilities (subjective)
 - Information on children's physical activities
 - Information on children's family background (incl. parenting style)
 - Information on children's exact location (confidential information)

- > Sample restricted to
 - 6,443 children aged 3-10 (with information on sports club participation)

Data

Kinderpanel

- > *infas Institut für angewandte sozialwissenschaft GmbH*, Bonn (paided for by the Deutschen Jugendinstituts)
- > Focuses on transitions
 - between kindergarten and primary school (cohort aged 5-6 in wave 1)
 - primary school and secondary school (cohort aged 8-9 in wave 1)
- > 3 waves (2002, 2004, 2005)

Data

Kinderpanel compared to KiGGS

> Advantage

- Panel structure allows more credible identification

> Disadvantages

- Small samples severely limit heterogeneity analysis
 - about 2000 kids, but much smaller if panel structure is fully used
 - grades available only for older cohort (further drastic reduction of sample size)
- Not all outcome variables available

> Used as a robustness and specification check

Data

Descriptive statistics (KiGGS)

- > Frequency of doing sports in a club

Frequency	Observations	%
> 5 times per week	50	1
3-5 times per week	331	6
1-2 times per week	2732	48
rarely	332	6
never	2203	39
Total	5648	100

- > Compare children who join a sports club on a regular basis (at least once a week: 55%) and those who don't (45%)
 - 85% of kids who do sports, do sports in a club

Data

Main outcome variables

- > Strength and Difficulties
 - Aggregated measures for emotional & behavioural problems, hyperactivity, peer problems, and prosocial behaviour (standardized)
- > 'Grades'
 - not available for everybody, depending on age and location (federal state)

Data

Further outcome variables

- > Objective health measures (examination)
 - Height & weight (→ BMI)
 - Triceps / skinfold (fat of skin at the upper arm / at the back in mm)
 - Various measurements of blood pressure and resting pulse
- > Subjective health (1-5) and well-being measures (1-100)
 - physical well-being (*body*)
 - emotional well-being (*soul*)
 - self-worth (*self*)
 - well-being in family and with friends
 - child's total quality of life (KINDL-R rest)

Data

Exogenous variables (not influenced by treatment) in KiGGS

Child's characteristics:	gender, age, birthweight, height
Family's characteristics:	social class, single parent household, net household income, number of siblings
Parents' characteristics:	education, employment status, BMI
Parenting style:	smoking during pregnancy, strict rules, family cares about each member, brushing teeth, attended childcare, mold in the house
Regional characteristics:	population density, recreation areas, municipalities tax income, share of service sector, population growth, East Germany, unemployment

Distance to different sport facilities (added by us)

Data

Descriptive statistics (KiGGS)

	No Sports	Sports	Sports - NoSports	Probit	
			p-val. %	coef.	p-val. %
Child characteristics					
Birthweight	3345	3361	36	0.00	82
Male	0.50	0.52	11	0.07	6
Family's characteristics					
Mom's education: University	0.14	0.19	0 ***	0.03	67
Mom's weight: overweight	0.23	0.21	10	-0.02	66
Mom's weight: obese	0.12	0.09	0 ***	-0.06	32
Single parent	0.13	0.08	0 ***	-0.09	19
Dad's education: University	0.19	0.28	0 ***	0.01	94
Lower class	0.31	0.15	0 ***	-0.15	1
Upper class	0.22	0.36	0 ***	0.02	78
Total household income	2025	2337	0 ***	0.00	0
Number of siblings	1.13	1.12	83	-0.10	0
Mom smoked during pregnancy	0.06	0.03	0 ***	-0.40	0
Strict rules at home	0.08	0.08	86	0.07	28
Few rules at home	0.08	0.06	2 **	-0.08	29
Family cares about child	0.57	0.55	13	-0.05	17
Brushing teeth 2 per day	0.77	0.84	0 ***	0.19	0
Regional characteristics					
Municipality size: < 5k	0.43	0.36	0 ***	0.03	65
Municipality size: 5-20k	0.11	0.12	39	-0.08	29
Municipality size: 20-100k	0.27	0.33	0 ***	ref.	
Municipality size: >100k	0.18	0.18	89	-0.23	0
East Germany	0.49	0.25	0 ***	-0.56	0
Local tax income	482	570	0 ***	0.00	63
Employment in service sector	61.78	61.67	81	0.00	3
Population growth	-1.75	-0.45	0 ***	0.01	17

Data

Descriptive statistics (KiGGS) – Main outcomes

	No Sports	Sports	Sports - NoSports (p-value)	Nr. of Obs.
Cognitive Skills				
Overall Grade	0.12	-0.15	0***	1703
Non-cognitive Skills				
Emotional Problems	0.04	-0.06	0***	5648
Behavioral Problems	0.06	-0.08	0***	5648
Hyperactivity	0.08	-0.10	0***	5648
Peer Problems	0.07	-0.18	0***	5648
Overall Score	0.09	-0.14	0***	5648
Prosocial Behavior	0.06	-0.06	0***	5648

Note: All outcome variables are standardized to mean zero and variance one. A lower value corresponds to a better outcome.

Standardized variables (0,1); negative sign means 'good'

Data

Descriptive statistics (KiGGS) – Further outcomes

	No Sports	Sports	Sports - NoSports: (p-value)	Nr. of Obs.
Well-being				
Total Well-being	0.01	-0.03	8*	5648
Well-being: body	0.04	-0.04	1***	5648
Well-being: soul	0.01	-0.02	40	5648
Well-being: self	-0.01	-0.01	87	5648
Well-being: family	-0.05	0.08	0***	5648
Well-being: friends	0.03	-0.03	2**	5648
Well-being: school	0.04	-0.10	0***	5102
Health				
BMI	-0.03	-0.02	74	5648
Skinfold	0.02	-0.06	0***	5648
Puls	0.19	-0.17	0***	5648
Subjective Health	0.03	-0.10	0***	5648

Note: All outcome variables are standardized to mean zero and variance one. For well-being and subjective health a lower value corresponds to a better outcome.

Empirical strategies

- > 2 ways to account for selection bias
 - Control for rather informative set of background characteristics
 - Caveat: Lagged outcome variables are missing
 - But: Can use kinderpanel to assess the impact of these missing variables
 - Use distance to closest facility as instrument
 - Will lead to estimates too imprecise to be a powerful tests of the previous 'selection on observables' strategy

Empirical strategies

Matching (1)

- > Control for informative set of background characteristics mentioned before (in a flexible way)
- > *Estimator*: Bias corrected (linear or logistic) X-augmented radius p-score matching with trimming
 - Best est. in large scale simulation study by Huber, Lechner, Wunsch (2010)
- > *Inference*: Bootstrap p-values based on bootstrap distribution of t-statistic of matching algorithm (given weights)
- > Major concerns
 - No lagged outcome variables
 - Endogeneity of control variables

Empirical strategies

Matching (2)

- > To address these concerns kinderpanel is used
 - Add lagged outcomes as additional controls
 - Address potential endogeneity that appears if control variables are influenced by sport participation (because measured in same periods)
 - lag control variables one period and use subpopulation not doing any sports in that periods

Empirical strategies

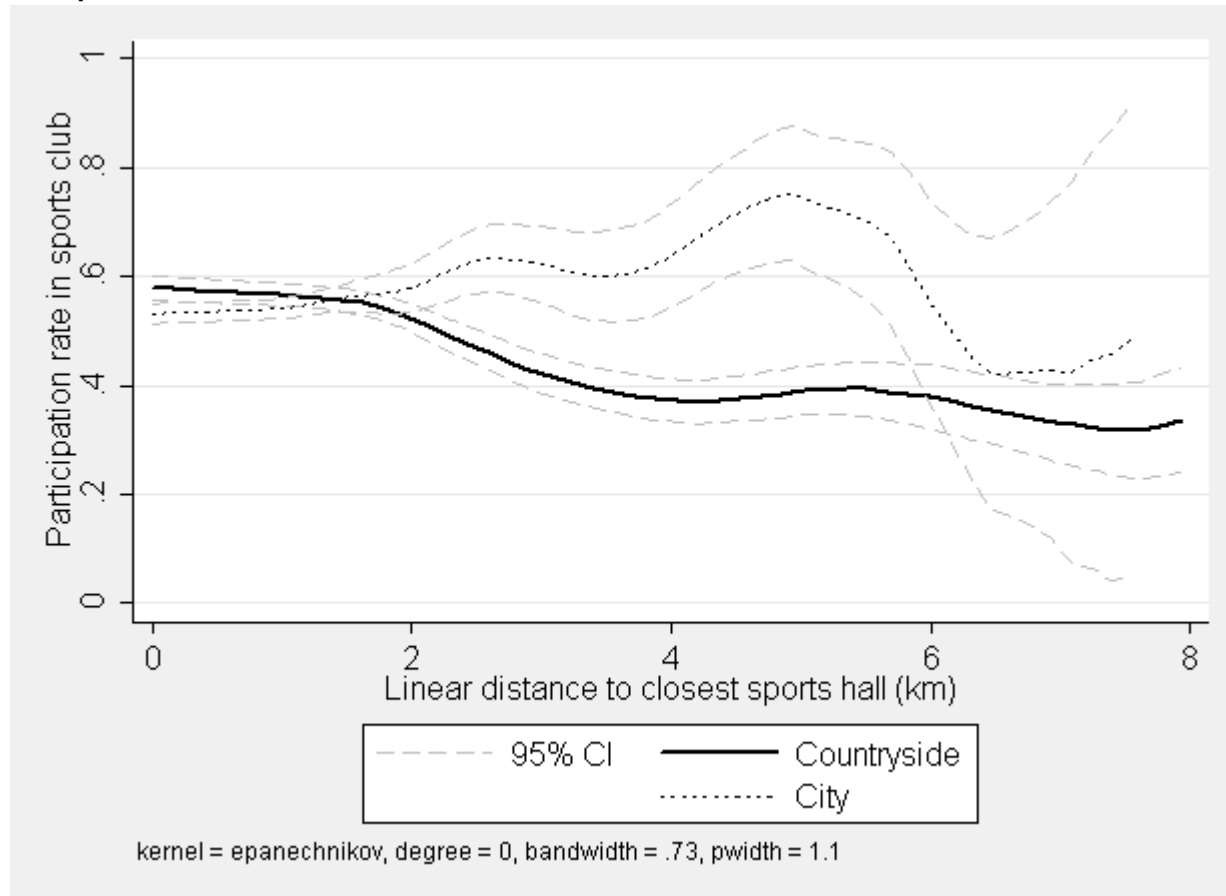
Semiparametric IV (1)

- > Instrument: Distance to closest sports hall
- > Potential concerns about exogeneity of instrument
 - 'Rich' individuals may move into areas with many facilities
 - 'Rich' neighbourhoods find more easily money to build such facilities (e.g. by attracting or forming clubs)
- > How we deal with those concerns?
 - Use covariates to control for factors jointly influencing location choice and club sports participation
- > For whom do we identify the effects (LATE)?
 - Effect for those for whom the distance matters (because of costs etc.)

Empirical strategies

Semiparametric IV (2)

- > The power of the instrument



Empirical strategies

Semiparametric IV (3)

- > Estimator: Ratio of two p-score bias corrected (logistic) X-augmented radius p-score ... matching estimators (ident.-proof in Frölich, 2007)
- > Estimator is based on a binary instrument (allows for heterogeneity)
 - To maximise the size of the complier population (under *monotonicity*) the two endpoints of a continuous instrument should be consider only
 - The information between the two endpoints is not informative
 - But: If (discretized) endpoints of instruments relate to too small groups sampling noise may become a major concern
 - Here: Previous figure suggests discretized version (cut-off 2.5 km)
- > Inference: Bootstrap distribution of estimates
- > Major concern: Are first stages strong enough?

Empirical strategies

Semiparametric IV (4)

- > First stages of LATE- $p(X)$ estimators
 - Figure already suggests that instrument has no power in big towns (may even violate monotonicity)

Estimated effect of instrument on sports participation (in %)

Complier	Y^1	Y^0	complier	std	95% CI	
Total	62	55	6	4	1	15
School	62	55	6	4	1	16
Kindergarden	62	55	6	5	2	20
Boys	57	46	11	4	2	16
Girls	43	35	9	4	2	18
East	36	34	3	3	0	11
West	66	55	11	5	5	25

But: First stage is too weak to lead to estimates that are precise enough

- Y^1 : Participation rate if living closer than 2.5 km to sports hall
- Y^0 : Participation rate if distance to sports hall > 2.5 km

Results

Matching: Main outcome variables

	Y ₁	Y ₀	θ (ATE)	p-val. %
Cognitive Skills				
Overall Grade	-0.13	0.04	-0.17	1
Non-cognitive Skills				
Emotional Problems	-0.05	0.07	-0.12	0
Behavioral Problems	-0.02	0.04	-0.05	12
Hyperactivity	-0.02	0.02	-0.04	19
Peer Problems	-0.09	0.10	-0.20	0
Overall Score	-0.06	0.08	-0.13	0
Prosocial Behavior	-0.01	0.02	-0.04	23

- (i) All variables standardized by standard deviation;
- (ii) the smaller the values the better

Results

Matching: Further outcome variables

	Y_1	Y_0	θ (ATE)	p-val. %
Well-being				
Total Well-being	-0.04	0.04	-0.08	1
Well-being: body	-0.05	0.04	-0.09	1
Well-being: soul	-0.03	0.02	-0.05	11
Well-being: self	-0.04	0.02	-0.05	9
Well-being: family	0.04	-0.03	0.07	2
Well-being: friends	-0.06	0.05	-0.11	0
Well-being: school	-0.07	0.00	-0.06	6
Health				
BMI	0.01	0.03	-0.02	53
Skinfold	0.00	0.04	-0.04	5
Puls	-0.03	0.07	-0.10	0
Subjective Health	-0.06	0.04	-0.10	0

Results

Robustness: Comparison to kinderpanel

	KiGGS		Kinderpanel A		Kinderpanel B		Kinderpanel C		Kinderpanel D	
	p-val.		p-val.		p-val.		p-val.		p-val.	
	θ	%	θ	%	θ	%	θ	%	θ	%
Cognitive Skills										
Overall Grade	-0.17	1	-0.15	2	-0.13	7	-0.09	11	-0.19	7
Non-cognitive Skills										
Emotional Problems	-0.12	0	-0.08	29	-0.01	91	-0.03	62	0.00	99
Behavioral Problems	-0.05	12	-0.09	13	-0.10	9	-0.07	27	-0.07	50
Hyperactivity	-0.04	19	0.08	21	0.05	30	0.07	17	0.20	16
Peer Problems	-0.20	0	-0.19	0	-0.05	69	-0.11	5	-0.22	5
Overall Score	-0.13	0	-0.10	9	-0.05	47	-0.05	32	-0.02	83
Prosocial Behavior	-0.04	23	0.02	75	0.09	40	0.07	22	0.06	58

Kinderpanel A: Treatment, controls and outcomes from wave 2

Kinderpanel B: As panel A but additionally controlling for outcomes in wave 1

Kinderpanel C: As panel B but controls taken from wave 1

Kinderpanel D: As panel D but without kids who did sports already in wave 1

Results

Further robustness checks

- > Leaving out 3 year old kids
- > Changing the flexibility of the specifications of the propensity scores
- > Parametric specifications (2SLS and OLS)
- > Continuous instruments in 2SLS
- > Alternative definitions of distance (driving time / direct line)
- > Alternative definitions of type of relevant facility

- > **Results are remarkably robust**

Results

Heterogeneity: ATE, ATET, ATENT

	ATE		ATET		ATENT	
	θ	p-val. %	θ	p-val. %	θ	p-val. %
Cognitive Skills						
Overall Grade	-0.17	1	-0.15	5	-0.21	0
Non-cognitive Skills						
Emotional Problems	-0.12	0	-0.13	0	-0.11	3
Behavioral Problems	-0.05	12	-0.07	8	-0.03	42
Hyperactivitiy	-0.04	19	-0.05	19	-0.03	44
Peer Problems	-0.20	0	-0.20	0	-0.20	0
Overall Score	-0.13	0	-0.14	0	-0.12	1
Prosocial Behavior	-0.04	23	-0.04	25	-0.03	47

Results

Heterogeneity: City vs. Countryside

	City				Countryside			
	Y ₁	Y ₀	θ	p-val. %	Y ₁	Y ₀	θ	p-val. %
Cognitive Skills								
Overall Grade	-0.08	0.06	-0.14	20	-0.15	-0.04	-0.10	13
Non-cognitive Skills								
Emotional Problems	-0.05	0.19	-0.24	0	-0.03	-0.02	-0.01	86
Behavioral Problems	0.00	0.05	-0.05	31	-0.03	-0.05	0.02	67
Hyperactivity	-0.03	0.04	-0.06	16	-0.01	-0.05	0.03	48
Peer Problems	-0.10	0.14	-0.24	0	-0.09	0.05	-0.13	0
Overall Score	-0.06	0.14	-0.20	0	-0.05	-0.04	-0.01	78
Prosocial Behavior	-0.04	-0.01	-0.03	62	-0.01	0.05	-0.05	16

Results

Heterogeneity: Boys vs. Girls

	Boys				Girls			
	Y ₁	Y ₀	θ	p-val. %	Y ₁	Y ₀	θ	p-val. %
Cognitive Skills								
Overall Grade	-0.08	0.03	-0.12	27	-0.19	0.03	-0.22	1
Non-cognitive Skills								
Emotional Problems	-0.04	0.00	-0.05	32	0.00	0.09	-0.10	2
Behavioral Problems	0.12	0.10	0.02	80	-0.13	-0.07	-0.05	17
Hyperactivity	0.10	0.15	-0.05	36	-0.12	-0.13	0.01	73
Peer Problems	0.02	0.20	-0.18	0	-0.22	-0.01	-0.22	0
Overall Score	0.07	0.16	-0.09	8	-0.16	-0.05	-0.11	0
Prosocial Behavior	0.19	0.13	0.06	25	-0.25	-0.14	-0.11	1

Results

Heterogeneity: Social class

	Lower class				Upper class			
	Y ₁	Y ₀	θ	p-val. %	Y ₁	Y ₀	θ	p-val. %
Cognitive Skills								
Overall Grade	0.18	0.40	-0.21	1	-0.31	-0.18	-0.13	32
Non-cognitive Skills								
Emotional Problems	0.1	0.14	-0.04	41	-0.11	-0.01	-0.11	3
Behavioral Problems	0.14	0.15	-0.02	80	-0.14	-0.06	-0.08	8
Hyperactivity	0.22	0.23	-0.01	82	-0.22	-0.17	-0.06	25
Peer Problems	0	0.22	-0.22	0	-0.17	0.01	-0.18	0
Overall Score	0.18	0.27	-0.09	8	-0.23	-0.09	-0.14	0
Prosocial Behavior	0.07	0.07	-0.01	92	-0.05	0.00	-0.05	44

Conclusions

- > **Positive effects of sports in clubs** for small kids with respect to cognitive and non-cognitive skills, health, and well-being
 - Important deviation: Negative effect on well-being in family
- > Not much effect heterogeneity detected
 - other than city-countryside
 - some boy-girl differences
- > Specifications are very robust
 - KiGGS results confirmed by kinderpanel which contains key missing confounders and has panel dimension
 - Instrument not strong enough to pin down effects precisely

Further research

- > How much of children's leisure time should we substitute with physical education in sports clubs?
- > Should the state substitute some of the non-physical education by physical education?
- > Is the state subsidy for the sports clubs justified?

Thank you for your attention!

Michael Lechner
University of St. Gallen - SEW
April 2011

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of the child's behavior over the last six months or this school year.

Child's name

Male/Female

Date of birth.....

	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restless, overactive, cannot stay still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often complains of headaches, stomach-aches or sickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shares readily with other children, for example toys, treats, pencils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often loses temper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rather solitary, prefers to play alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally well behaved, usually does what adults request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many worries or often seems worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helpful if someone is hurt, upset or feeling ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has at least one good friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often fights with other children or bullies them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often unhappy, depressed or tearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generally liked by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easily distracted, concentration wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous or clingy in new situations, easily loses confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often lies or cheats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Picked on or bullied by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Often offers to help others (parents, teachers, other children)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thinks things out before acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steals from home, school or elsewhere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gets along better with adults than with other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many fears, easily scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good attention span, sees work through to the end	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1. Körperliches Wohlbefinden

<i>In der letzten Woche ...</i>	nie	selten	manchmal	oft	immer
1. ... hat mein Kind sich krank gefühlt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ... hatte mein Kind Kopfschmerzen oder Bauchschmerzen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ... war mein Kind müde und schlapp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ... hatte mein Kind viel Kraft und Ausdauer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Seelisches Wohlbefinden

<i>In der letzten Woche ...</i>	nie	selten	manchmal	oft	immer
1. ... hat mein Kind viel gelacht und Spaß gehabt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ... hatte mein Kind zu nichts Lust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ... hat mein Kind sich allein gefühlt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ... hat mein Kind sich ängstlich oder unsicher gefühlt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Selbstwert

<i>In der letzten Woche ...</i>	nie	selten	manchmal	oft	immer
1. ... war mein Kind stolz auf sich	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ... fühlte mein Kind sich wohl in seiner Haut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ... mochte mein Kind sich selbst leiden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ... hatte mein Kind viele gute Ideen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Familie

<i>In der letzten Woche ...</i>	nie	selten	manchmal	oft	immer
1. ... hat mein Kind sich gut mit uns als Eltern verstanden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ... hat mein Kind sich zu Hause wohl gefühlt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ... hatten wir schlimmen Streit zu Hause	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ... fühlte mein Kind sich durch mich bevormundet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Freunde

<i>In der letzten Woche ...</i>	nie	selten	manchmal	oft	immer
1. ... hat mein Kind mit Freunden gespielt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ... ist mein Kind bei anderen „gut angekommen“	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ... hat mein Kind sich gut mit seinen Freunden verstanden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ... hatte mein Kind das Gefühl, dass es anders ist als die anderen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Vorschule / Kindergarten

<i>In der letzten Woche, in der mein Kind in der Vorschule/den Kindergarten war, ...</i>	nie	selten	manchmal	oft	immer
1. ... hat mein Kind die Aufgaben in der Vorschule/ im Kindergarten gut geschafft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ... hat meinem Kind die Vorschule/ der Kindergarten Spaß gemacht	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ... hat mein Kind sich auf die Vorschule/ den Kindergarten gefreut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ... hat mein Kind bei kleineren Aufgaben oder Hausaufgaben viele Fehler gemacht	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Probit für Matching (all)		
Variable	Coef.	p-val. %
Constant	-0.39	36
Height	0.00	30
Birthweight	0.00	82
Age 3	-0.73	0
Age 4	-0.40	0
Age 5	-0.11	13
Age 7	0.16	2
Age 8	0.26	0
Age 9	0.31	0
Age 10	0.17	11
Male	0.07	6
Mom education: basic	-0.16	0
Mom education: high school	0.09	12
Mom education: university	0.03	67
Mom education: other	-0.63	0
Dad education: basic	0.04	41
Dad education: high school	0.16	2
Dad education: university	0.01	94
Dad education: other	-0.01	95
Mom: Not working	-0.03	58
Mom: Unemployed	-0.10	15
Mom: Fulltime	-0.19	0
Dad: Not working	0.24	7
Dad: Unemployed	-0.13	13
Mom: Unskilled job	-0.11	10
Mom: Semiskilled job	0.07	26
Mom: Other job	-0.38	1
Mom: Housewife	-0.06	43
Dad: Unskilled job	-0.13	4
Dad: Self employed	0.06	27

Smoking during pregnancy: regularly	-0.40	0
Smoking during pregnancy: occasionally	-0.13	3
Family cares: no	0.22	43
Family cares: rather no	-0.07	60
Family cares: yes	-0.05	17
Few rules: rather yes	-0.08	12
Few rules: yes	-0.08	29
Strict rules: no	-0.12	5
Strict rules: rather no	-0.10	2
Strict rules: yes	0.07	28
Toothbrush 2 times daily	0.19	0
Mold at home	-0.22	2
Household inc (continuous)	0.00	0
Household inc lowest category (binary)	-0.08	76
Household inc highest category (binary)	0.55	0
Household inc: missing	0.29	1
Siblings in household	-0.10	0
Older sibling in hh (binary)	0.02	72
Mom bmi: overweight	-0.02	66
Mom bmi: obese	-0.06	32
Dad bmi: overweight	0.07	7
Dad bmi: obese	-0.06	32
Low social class	-0.15	1
High social class	0.02	78
Single parent household	-0.09	19
Municipality size: <5K	0.03	65
Municipality size: 5-20K	-0.08	29
Municipality size: >100K	-0.23	0
East: Municipality size: <5K	-0.15	14
East: Municipality size: 5-20K	-0.07	64
East: Municipality size: >100K	0.19	16
East: Recreation area- first tercile	0.00	96
East: Recreation area- third tercile	-0.03	70
West: Recreation area- first tercile	-0.02	76
West: Recreation area- third tercile	-0.04	45
Tax income per capita	0.00	63
Share of labor force in tertiary sector	0.00	3
Population change	0.01	17
East: population change	0.00	95
East Germany	-0.56	0
Efron's R ² :	0.201	

Probit für LATE (countryside)		
Variable	Coef.	p-val. %
Constant	-1.03	34
Male	0.11	4
Age 3	-0.02	83
Age 4	-0.28	1
Age 5	0.24	4
Age 7	0.19	8
Age 8	-0.11	31
Age 9	0.10	35
Age 10	-0.03	77
Mom education: basic	0.16	7
Mom education: high school	0.02	85
Mom education: university	0.02	85
Dad education: basic	-0.27	0
Dad education: high school	0.16	15
Dad education: university	0.12	35
Mom bmi: overweight	0.01	93
Mom bmi: obese	0.08	40
Low social class	-0.11	16
High social class	0.04	73
Single parent household	0.24	2
East Germany	0.30	82
East: log population density	0.78	0
East: log recreation area per capita (in m ²)	0.37	0
East: log tax income per capita	-0.99	0
East: log share of labor force in tertiary sector	0.32	12
West: log population density	0.51	0
West: log recreation area per capita (in m ²)	-0.36	0
West: log tax income per capita	-0.26	15
West: log share of labor force in tertiary sector	0.61	0
West: population change	12.74	0
Efron's R ² :	0.282	

