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**Research Report**

## SOEP-IS 2013 - On the socioeconomic effects of physical activity

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## SOEP-IS 2013 – On the socio-economic effects of physical activity

Michael Lechner and Tim Pawlowski

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# **SOEP-IS 2013 – On the socio-economic effects of physical activity**

**Module Title in SOEP Documentation: Socio-economic Effects of Physical Activity**

**Michael Lechner and Tim Pawlowski**

## Proposal for the SOEP-IS 2013

*submitted by*

Michael Lechner & Tim Pawlowski

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St. Gallen & Tübingen, December 19, 2012

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Selection of recent publications:

The performance of estimators based on the propensity score, forthcoming in the *Journal of Econometrics* (jointly with M. Huber, C. Wunsch).

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- Public employment services and employers: How important are networks with firms?, *Zeitschrift für Betriebswirtschaft*, 1/2008, 151-178, 2008 (jointly with S. Behncke, M. Frölich).

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Selection of recent publications:

- Pawlowski, T. & Breuer, C. (2012). *Die finanzpolitische Bedeutung des Sports in Deutschland*. Wiesbaden: Springer-Gabler Research.
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For a complete list please refer to:

<http://medien2.ifs.sozialwissenschaften.uni-tuebingen.de/ifs/arbeitsbereiche/ab1/literatur/pawlowski.pdf>

## 2. Research Proposal

### 2.1 Topic

Our proposal for the SOEP-IS is focused on measuring the socio-economic effects of physical activity, i.e. activities which result in increased heart beats and increased breathing rates for a certain time (like sport or walking/cycling to work). So far, although being highly relevant for policy makers and managers, this area of research has been almost completely neglected by the scientific community due to a lack of reliable (panel) data in Germany (and other countries; for an overview see Downward, Dawson, & Dejonghe, 2009). Furthermore, due to a lack of such data, revealing a causal link between physical activity and some personal characteristics has not always been possible. Therefore, confusion exists with regard to some variables being either a “determinant” or an “effect” of physical activity.<sup>1</sup>

In the following sections, the state of research (2.2), our research questions (2.3) and the data requirements (2.4) are presented and discussed in detail.

### 2.2 State of Research

Sports-related public expenditures<sup>2</sup> are commonly legitimated with the existence of market failures (externalities), such as a reduction of *health care costs* or the accumulation of *social capital* associated with sport (in a narrow sense) or physical activity (in a broader sense). However, empirical evidence validating those links in Europe is scarce and the applied measures and methods to quantify the effects lack in credibility as will be discussed in the following.

For instance, the positive impact of sports participation on the health *status* has already been largely investigated (US Department of Health and Human Services, 2008; Warburton, Nicol & Bredin, 2006; Sari, 2009; Sari, 2010). However, the reduction of health care costs associated with sports participation has - due to data availability - most often been quantified only in North America (e.g. Colditz, 1999; Katzmarzyk, Gledhill & Shephard, 2000). Since leisure time sports are very differently organized in North America than in Europe, it is difficult to infer any pattern from the American studies in order to analyze/predict the European case. Furthermore, since the opportunity costs of being physically active are not equally distributed amongst individuals (Wagner, 1987) thoroughly developed analysis based on micro data would be necessary.

Furthermore, most of the studies measuring the extent to which *social capital* is accumulated by physically active people or volunteers in non-profit sport clubs routinely employ “input” measures. For instance, the economic significance of voluntary activity in non-profit sport clubs is usually estimated by multiplying the hours spent on such voluntary activities and the average wage rate (e.g. Breuer, 2009). However, such simplifying “input” measures neglect the heterogeneous quality of social interactions in the clubs (Langer, 2006) and the possibility of reverse causality, i.e. joining sport clubs could be an expression of a certain degree of social capital (trust, see Downward, Pawlowski & Rasciute, *work in progress*). In

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<sup>1</sup> For instance many papers routinely assume that personal income is a determinant of physical activity (e.g. Cerin & Leslie, 2008, Farrell & Shields, 2002), while others could detect that physically active people receive a higher personal income (Lechner, 2009).

<sup>2</sup> For instance, sports-related public expenditures in Germany sum up to around 10 billion Euros per year (Pawlowski & Breuer, 2012).

addition, a significant part of the literature existing on the returns of sports participation on education and labour-market outcomes again concerns American data (Barron, Ewing & Waddell, 2000; Eide & Ronan, 2001; Ewing, 2007; Lipscomb, 2007; Stevenson, 2010 or Caudill & Long, 2010).<sup>3</sup> Studies using European data are scarce, however. Recent studies suggest that sports participation has a positive impact on children's cognitive and non-cognitive skills development (Felfe, Lechner & Steinmayr, 2010), on education (Pfeifer & Cornelissen, 2010) as well as on adult labour-market success (Lechner, 2009; Rooth 2011). Furthermore, Becchetti, Pelloni and Rossetti (2008) examine the GSOEP with the result that the relational goods, including sports participation individually and collectively increase subjective well-being (SWB). Actually, Lechner (2009) uses the GSOEP to explore (amongst others) how sports participation affects monthly earnings, health measures and subjective well-being. One of Lechner's findings suggests that physically active people (crudely defined) earn on average 1.200 Euros (per year) more than others. In addition, Rooth (2011) performs an experiment emphasizing the importance of leisure sports participation indication on curriculums in Sweden. He finds that people who mention that they are sporty have higher response rate than the others in terms of invitation to interviews. To the best of our knowledge, these are the principal European studies available on this topic.

Although these studies have clearly advanced our understanding about the socio-economic effects of physical activity, they are heavily restricted by the scarce availability of variables measuring physical activity. So far, in the GSOEP only one relevant question exists which evaluates the frequency of practicing sports on a 4-point-scale.<sup>4</sup>

However, since it is very likely that the effects of physical activity depend on various characteristics such as the kind of activity and the organizational format, studies based on this rough measure face the risk of ecological fallacies (Robinson, 1950) and it remains unclear which intensity and frequency of physical activity is needed to obtain those effects. Furthermore, due to a lack of information it is not always possible to reveal a causal link. Therefore, confusion exists with regard to some variables being either a "determinant" or an "effect" of physical activity. For instance, while traditional studies just claim for educational level and income as being a determinant of physical activity, recent studies could detect that significant returns of sports participation on the development of skills and labour-market outcomes exist (as discussed above for earnings).

To overcome the lack of reliable measures of physical activity, a detailed catalogue of questions is proposed for the SOEP-IS. This catalogue consists of thoroughly developed questions on the kind of physical activity, the frequency and intensity as well as the organizational format a sport is practiced and the possible persistence of activity patterns over the span of life.

### *2.3 Research questions*

With such kind of additional information it will be possible to better understand the various factors influencing physical activity and the possible effects associated with physical activity. Therefore, we expect to find reliable answers on various related questions as will be discussed in the following.

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<sup>3</sup> A detailed literature review can be found in Felfe et al. (2011).

<sup>4</sup> For instance, in the SOEP 2005 the question was as follows: "Which of the following activities do you take part in during your free time?" → "Doing sports yourself: at least once a week, at least once a month, less often, never".

### **2.3.1 Physical activity and health**

Long term sports participation effects on health cannot be comprehended without having precise information of the nature of the practice in terms of sports types, intensity and frequency all along individual's life.

What is the optimal level of sports participation (for example using the reasoning of a health investment model along the lines of Grossman (1972))? Does the optimal level of sports participation varies with respect to the kind of sport? Is there a threshold above which sports participation has a negative impact on one's health? Furthermore, the question of healthy ageing is getting more topical and sports participation might improve the health of the elderly. But the question is to which extent? And also: is there an age (to begin or to continue with) after which practicing sport is not useful anymore?

With such kind of knowledge it might also be possible to estimate the reduction of health care costs associated with sports participation.

### **2.3.2 Physical activity and education**

Studies using American data suggest that sports participation is an investment that students do on top of studying (Barron et al., 2000). And actually, the North American educational system highly promotes sports participation (scholarships, etc.). The European systems of education used to be very different. Having yearly precise information on individual's sport participation would allow us to study the evolution of it and the educational choices in Germany. Do sports influence educational choices or is it the other way round (Anderson, 2001)? How do sporty people use the educational system?

### **2.3.3 Physical activity and labour-market outcomes**

North American studies outline the positive impact of sporting activities (usually during college) on adult labour-market outcomes (mainly wages). They struggle to demonstrate the existence of a causal relationship but also to precisely interpret the impact or to identify the channels. The GSOEP provides very rich panel data which contain a substantial number of information with respect to individual's labour-market position. Therefore, by adding more information on sports participation, we would be able to study the impact of sporting activities on very diverse outcomes.

First of all the question of the labour-market entry is extremely relevant since it is well-known that the first job has a determinant role in individual's career path. Then it would be interesting to analyze individual's career path and opportunities and also unemployment issues. Last, sports participation could have a non-negligible impact on labour-market exit. Because of a better health (and a better job?) sporty people would stay employed longer, but, since they are healthier and enjoy practising sport, they might retire earlier in order to benefit from their retirement time and do more sport.

### **2.3.4 Physical activity and well-being**

Beyond the traditional economic representation of individual success (labour-market success), it is interesting to study the impact of physical activity on individual's well-being, too. Indeed, sporting activities favour a specific type of behaviour / within specific sports

some behaviour are promoted such as solidarity, tenacity, merit, etc. and they form a substantial part of individual's well-being determinants (Rasciute & Downward, 2010).

### **2.3.5 Physical activity determinants**

Having a precise definition of individual's sports participation all along their life will allow us to better understand sporty behaviours. And this is relevant in case we find a positive impact of sports participation (thus we would want to impact / influence individual's sports participation). We expect different sporty behaviours according to age, gender, socio-economic background (see for example Bauman, Sallis, Dzewaltowski, & Owen, 2002). And the initial (childhood) sports participation might have an impact on the later participation. But the question is to which extent social background determines sports participation? Do non-sporty children become sporty adults? Do people change from doing team sports to individual sports with age (because it is easier in terms of organisation for example)?

Finally, three channels are traditionally highlighted in order to explain sports participation impact on education or labour-market outcomes. First, by improving individual's health status sporting activities improve individual's level of productivity (which leads to more success in school and on the labour-market). Second, by developing cognitive and non-cognitive skills sporting activities increase the human capital and thus the individual's productivity. Third, sports participation can be a way to socialize and then to enlarge and diversify one's social network.

Knowing the precise type of sport people do and the kind of investment they make in sport - in terms of time for example - will allow us to identify more precisely the channels at work.

## **2.4 Data requirements**

As originally asked in the GSOEP, we are very interested in the frequency of sports participation. And since it is well-known that the length of the sporting activity is decisive we also add a respective question. Furthermore, in a time-consumption perspective it is relevant to know how much time people spend doing sports.

The cognitive and non-cognitive skills associated to sports participation depend on the type of sports people do (team sport versus individual sport, for example) but they also depend on the context. Differences may arise from differences in the intensity of the participation (competition level or not) and the environment (within a club, with friends, etc.). With respect to sports practice determinants information is already available in the GSOEP data, however, the information with respect to the sports infrastructure distance (for using such information in the context of children, see for example Steinmayr, Felfe, & Lechner (2011) is not asked every year. Therefore, we propose to collect this information yearly and in a more precise way (by asking about the means of transport and the exact time required to reach the place).

Last, we are interested in childhood sports participation. The same kind of information is already available in the GSOEP but only since 2000 and for 17 years-old respondents. Our questionnaire would allow collecting this information for each respondent which is relevant when one wants to construct the sports participation history of the individual. Furthermore, our questionnaire would permit to have more precise information with respect to the context of the sports participation.

The additional questions on sports proposed here should be asked to the entire SOEP-IS population for at least 5 years, i.e. wave E, wave I and the actual wave. Sections A to C should be included yearly while the section D should be put only once to each respondent.

We estimate that the response time needed for subjects to answer these questions will be less than 5 minutes. Computer assisted personal interviews (CAPI) can be applied, but CATI would also be possible.

Ideally, we would like to include the sports questions in the SOEP core sample. Indeed, there are a lot of research questions linking sports participation to numerous life outcomes (health, education, labour-market integration and outcomes, behaviors, etc.) that are waiting to be addressed. This information is available in the SOEP core sample but not in the SOEP-IS which by construction limits the extent of the research. It is worthwhile to outline that if these questions are included in the SOEP core sample the sports-related questions asked to children and adolescents could be removed. Therefore, it would not increase the length of the main questionnaire too much. If including these questions annually is not possible, it would be helpful if all, or at least some of them, can be included in a three year rotation.

Finally, our above mentioned data requirements are based on the assumption, that all variables inquired in the "individual question form" of the 2011 SOEP-IS will also be inquired in the 2013 (and ongoing) SOEP-IS.

### 3. Preliminary version of the proposed survey questions

#### 3.1 English

##### **A) Physical activity**

Physical activity includes those activities which result in increased heart beats and increased breathing rates for a certain time. For instance, sport or walking/cycling to work as well as the shopping center belongs to physical activity.

- (1) Regarding the last seven days, how many days have you been active for at least 60 minutes per day?  
→ \_\_\_\_ days
  - (2) Regarding a regular week, how many days are you active for at least 60 minutes per day?  
→ \_\_\_\_ days
  - (3) How often do you actively practice sport, fitness or gymnastics?
    - a) Every day
    - b) Several times a week
    - c) Once a week
    - d) Less often
    - e) Never
    - f) I don't know.
    - g) No statement
- if (3) = a), b), c) or d) go to (4)  
→ if (3) = e), f) or g) & age  $\geq 18$  years go to (22)

##### **B) Most frequent sport**

- (4) Regarding the whole year, which kind of sport do you practice most frequently?  
→ Drop-down-choice (single sports)
- (5) How often do you usually practice this sport?  
→ \_\_\_\_ times a week
- (6) How many minutes do you practice this sport every time?  
→ \_\_\_\_ minutes
- (7) Do you participate in competitions regarding the sport you mentioned above, e.g. league matches, public runs or cycle races?
  - a) Yes
  - b) No
  - c) I don't know.
  - d) No statement.
- (8) Where do you generally practice this sport?  
→ Drop-down choice (gym, swimming pool, park etc.)
- (9) How long do you usually need to reach your sport facility (gym, swimming pool, park etc.)?  
→ \_\_\_\_ minutes

(10) How do you get there?

➔ Drop-down choice (car, bicycle, public transport, by foot etc.)

(11) In which organizational form do you practice this sport?

- a) Sports club
- b) Company-facilitated sports activities
- c) Commercial provider (incl. fitness center)
- d) Alone, not organized
- e) With friends or relatives, not organized
- f) Other: \_\_\_\_\_

(12) At which age did you start practicing this sport?

➔ \_\_\_\_ age in years

**C) Second most frequent/common sports**

(13) Regarding the whole year, which kind of sport do you practice the second most frequent?

➔ Drop-down choice (single sport)

(14) How often do you usually practice this sport?

➔ \_\_\_\_ times a week

(15) How many minutes do you practice this sport every time?

➔ \_\_\_\_ minutes

(16) Do you participate in competitions in the sport you mentioned above, e.g. league matches, public runs or cycle races?

- a) Yes
- b) No
- c) I don't know.
- d) No statement.

(17) Where do you generally practice this sport?

➔ Drop-down choice (gym, swimming pool, park etc.)

(18) How long do you usually need to reach your sport facility (gym, swimming pool, park etc.)?

➔ \_\_\_\_ minutes

(19) How do you get there?

➔ Drop-down choice (car, bicycle, public transport, by foot etc.)

(20) In which organizational form do you practice this sport?

- a) Sport club
- b) Company-facilitated sports activities
- c) Commercial provider (incl. fitness center)
- d) Alone, not organized
- e) With friends or relatives, not organized
- f) Other: \_\_\_\_\_

(21) At which age did you start practicing this sport?

➔ \_\_\_\_ age in years

**D) Sports in childhood and adolescence**

(22) If you think about your childhood and youth, which kind of sport did you practice (beyond school) most frequent?

➔ Drop-down choice (single sport)

(23) How often did you usually practice this sport?

➔ \_\_\_\_ times per week

(24) How many minutes did you practice this sport every time?

➔ \_\_\_\_ minutes

(25) Did you participate in competitions in the sport you mentioned above, e.g. league matches, public runs or cycle races?

- a) Yes
- b) No
- c) I don't know.
- d) No statement.

(26) Where did you generally practice this sport?

➔ Drop-down choice (gym, swimming pool, park etc.)

(27) In which organizational form did you practice this sport?

- a) Sport club
- b) Company-facilitated sports activities
- c) Commercial provider (incl. fitness center)
- d) Alone, not organized
- e) With friends or relatives, not organized
- f) Other: \_\_\_\_\_

### 3.2 German

#### **A) Körperliche Aktivität**

Unter körperlicher Aktivität verstehen wir alle Tätigkeiten, bei denen das Herz schneller schlägt und die Atmung für einige Zeit erhöht wird. Hierzu zählen beispielsweise Sport, der Fuß- oder Radweg zur Arbeit oder zum Einkaufen.

- (1) An wie vielen der letzten sieben Tagen waren Sie für mindestens 60 min am Tag körperlich aktiv?  
→ \_\_\_\_ Tage
- (2) An wie vielen Tagen einer normalen Woche sind Sie für mindestens 60 min am Tag körperlich aktiv?  
→ \_\_\_\_ Tage
- (3) Wie häufig treiben Sie aktiv Sport, Fitness oder Gymnastik?
  - a) jeden Tag
  - b) mehrmals die Woche
  - c) einmal die Woche
  - d) seltener
  - e) nie
  - f) weiß nicht
  - g) keine Angabe

→ wenn (3) = a), b), c) oder d) weiter mit (4),  
→ wenn (3) = e), f) oder g) & Alter  $\geq 18$  Jahren weiter mit (22)

#### **B) Häufigste Sportart**

- (4) Welche Sportart üben Sie, das ganze Jahr betrachtet, am häufigsten aus?  
→ *Drop-down-Auswahl (einzelne Sportarten)*
- (5) Wie oft üben Sie diese Sportart in der Regel aus?  
→ \_\_\_\_ mal pro Woche
- (6) Wie viele Minuten üben Sie diese Sportart bei jedem Mal aus?  
→ \_\_\_\_ min
- (7) Nehmen Sie in dieser Sportart auch an Wettbewerben, zum Beispiel an Ligaspielen, Volksläufen oder Radrennen teil??
  - a) ja
  - b) nein
  - h) weiß nicht
  - i) keine Angabe
- (8) Wo üben Sie diese Sportart in der Regel aus?  
→ *Drop-down-Auswahl (Sporthalle, Hallenbad, Park etc.)*
- (9) Wie viele Minuten brauchen Sie in der Regel für den Weg zu diesem Sportangebot?  
→ \_\_\_\_ min
- (10) Wie gelangen Sie zu diesem Sportangebot?  
→ *Drop-down-Auswahl (Auto, Fahrrad, ÖPNV, zu Fuß etc.)*

(11) In welcher Organisation üben Sie diese Sportart hauptsächlich aus?

- a) Sportverein
- b) Betriebssport
- c) Kommerzieller Anbieter (auch: Fitness-Studio)
- d) alleine, unorganisiert
- e) mit Freunden, Bekannten, Verwandten, unorganisiert
- f) Sonstiges: \_\_\_\_\_

(12) In welchem Alter haben Sie mit dieser Sportart begonnen?

→ \_\_\_\_ Alter in Jahren

### **C) Zweithäufigste Sportart**

(13) Welche Sportart üben Sie, das ganze Jahr betrachtet, am zweithäufigsten aus?

→ *Drop-down-Auswahl (einzelne Sportarten)*

(14) Wie oft üben Sie diese Sportart in der Regel aus?

→ \_\_\_\_ mal pro Woche

(15) Wie viele Minuten üben Sie diese Sportart bei jedem Mal aus?

→ \_\_\_\_ min

(16) Nehmen Sie in dieser Sportart auch an Wettbewerben, zum Beispiel an Ligaspielen, Volksläufen oder Radrennen, teil??

- c) ja
- d) nein
- j) weiß nicht
- k) keine Angabe

(17) Wo üben Sie diese Sportart in der Regel aus?

→ *Drop-down-Auswahl (Sporthalle, Hallenbad, Park etc.)*

(18) Wie viele Minuten brauchen Sie in der Regel für den Weg zu diesem Sportangebot?

→ \_\_\_\_ min

(19) Wie gelangen Sie zu diesem Sportangebot?

→ *Drop-down-Auswahl (Auto, Fahrrad, ÖPNV, zu Fuß etc.)*

(20) In welcher Organisation üben Sie diese Sportart hauptsächlich aus?

- g) Sportverein
- h) Betriebssport
- i) Kommerzieller Anbieter (auch: Fitness-Studio)
- j) alleine, unorganisiert
- k) mit Freunden, Bekannten, Verwandten, unorganisiert
- l) Sonstiges: \_\_\_\_\_

(21) In welchem Alter haben Sie mit dieser Sportart begonnen?

→ \_\_\_\_ Alter in Jahren

### **D) Sport im Kindes- und Jugendalter**

(22) Wenn Sie an Ihre Kindheit und Jugend zurückdenken, welche Sportart haben Sie außerhalb der Schule am häufigsten regelmäßig ausgeübt?

→ *Drop-down-Auswahl (einzelne Sportarten)*

(23) Wie oft haben Sie diese Sportart in der Regel ausgeübt?

→ \_\_\_\_ mal pro Woche

(24) Wie viele Minuten haben Sie diese Sportart bei jedem Mal ausgeübt?

→ \_\_\_\_ min

(25) Haben Sie in dieser Sportart auch an Wettbewerben, zum Beispiel an Ligaspielen, Volksläufen oder Radrennen teilgenommen??

- e) ja
- f) nein
- l) weiß nicht
- m) keine Angabe

(26) Wo haben Sie diese Sportart in der Regel ausgeübt?

→ Drop-down-Auswahl (Sporthalle, Hallenbad, Park etc.)

(27) In welcher Organisation haben Sie diese Sportart hauptsächlich aus?

- m) Sportverein
- n) Betriebssport
- o) Kommerzieller Anbieter (auch: Fitness-Studio)
- p) alleine, unorganisiert
- q) mit Freunden, Bekannten, Verwandten, unorganisiert
- r) Sonstiges: \_\_\_\_\_

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