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Physical activity is an important public health issue and the benefits of an active lifestyle in relation to well-being and health have been strongly emphasised in recent years in Europe, as well as in most parts of the world. However, previous research has shown that physical activity within Europe and its member states is stratified. The present article gains insight into (1) the *geographical stratification* and (2) the *social stratification* of physical activity in the 27 European member states in 2005. Special attention is given to sporting activity in comparison to other forms of physical activity (transport, occupation, household). By doing this we intend to develop a picture of physical activity, in particular sporting activity, within the European Union. In addition, we want to verify whether low sporting activity levels are counterbalanced by other pieces of the total “menu of physical activities”. Based on Eurobarometer data from 2005 ( $N = 26,688$ ), bivariate analyses show that 4 out of 10 Europeans are not exposed to sporting activity. Moreover, particular subgroups of non-sportive citizens could be distinguished: South and East Europeans, and women, elderly, individuals with a lower educational level and rural citizens. Our hypothesis that these groups would compensate for their non-sporting activity by being physically active in other domains could only be confirmed for women and rural citizens, in particular with regard to household physical activity. To understand the underlying structure of these possible *compensation mechanisms*, additional quantitative and qualitative research is needed. Nevertheless, because of societal trends towards an inactive society, the role of sporting activity will be increasingly important in the future for *all* inactive subgroups. For this purpose, not only should necessary resources and key stakeholders be identified, but more importantly the social and environmental barriers for sporting activity need to be addressed.

*Keywords:* Sporting activity; Physical activity; European Union; Geographical stratification; Social stratification; Eurobarometer; Compensation mechanisms

## **Introduction**

Even in Greek antiquity, a physically inactive lifestyle has been associated with health problems. For example, Hippocrates wrote that an inactive body grows slowly, is more susceptible to diseases and encourages the ageing process. However, it wasn't until halfway through the twentieth century that the relationship between physical (in)activity, fitness and health was studied on a scientific base and on a large scale. In the last decennia, all kinds of authorities—national as well as international—have criticized the lack of physical activity in society and its subsequent health problems (Brownson et al., 2001; Cavill, Kahlmeier, & Racioppi, 2006; Rütten & Abu-Omar, 2004; Tammelin et al., 2003). Physical inactivity is associated with increased risk of chronic diseases and premature mortality (Inchley et al., 2005) and with other diseases such as hypertension, diabetes, osteoporosis, particular forms of cancer, obesity and even psychological disorders (Kafatos et al., 1999). Physical inactivity is estimated to account for about 600,000 deaths per year in the WHO's European region (Cavill, Kahlmeier, & Racioppi, 2006). In addition, more than half of the adult population in this region is overweight or obese, and obesity-related illnesses are estimated to account for as much as 7% of total healthcare costs in the EU. The European Commission believes, therefore, that the EU and its member states must take proactive steps to reverse the decline in physical activity that has occurred over the past several decades. In 2007 the Commission adopted two white papers in which the need for physical activity figures prominently. The White Paper on a Strategy for Europe on Nutrition, Overweight and Obesity related health issues (European Commission, 2007a) sets out a wide range of proposals on how the EU can tackle nutrition, overweight and obesity-related health issues. It stresses the importance of enabling consumers to make informed and healthy choices, and calls upon the food industry to work on their recipes. In addition, it also

stresses the benefit of physical activity and encourages Europeans to exercise more. Moreover, this White Paper calls for more action-oriented partnerships across the EU involving private actors and public health and consumer organisations. The need for EU action in the area of nutrition and physical activity stems from the previously mentioned increasing prevalence of overweight and obesity, and from the low levels of physical activity in Europe. The White Paper on Sport (European Commission, 2007b) on the other hand, focuses on the societal role of sport, its economic dimension and its organisation in Europe, and on the follow-up that will be given to this initiative. This White Paper marks the first time that the Commission is addressing sport-related issues in a comprehensive and coherent matter. It builds on a period of more than two decades during which sport has gradually become a topic on the European agenda. In preparing this White Paper, the Commission has held numerous consultations with sport stakeholders on issues of common interest as well as an on-line consultation. They have demonstrated that considerable expectations exist concerning the role of sport in Europe and EU action in this area. Concrete proposals for further EU action are brought together in an action plan named after Pierre de Coubertin which contains activities to be implemented or supported by the Commission. Action number 1 of this plan foresees that the Commission and the Member States will develop new physical activity guidelines before the end of 2008. Consequently, an expert group (consisting of 22 independent experts) and the EU Working Group on Sport & Health (consisting of representatives of Member States) prepared a draft of the EU physical activity guidelines. However, it should be stressed that these physical activity guidelines will not become a binding document. They should merely be perceived as a source of inspiration for the Member States, regional and local authorities, sport organisations, civil society organisations and other relevant actors to define and implement policies which would make it easier for Europeans to be

physically active as part of their daily lives. In these guidelines, the EU defines physical activity as “any bodily movement associated with muscular contraction that increases energy expenditure above resting levels” (European Commission, 2008, p. 3). This broad definition includes different contexts of physical activity, i.e., leisure-time physical activity or sport, occupational physical activity, physical activity from household activities and physical activity connected with self-powered transport. The present article focuses specifically on the contribution of leisure-time physical activity or sport activities.<sup>1</sup> Moreover, we compare levels of sporting activity to other forms of physical activity.

After World War II, many (West) European countries developed a noticeably active government policy with regard to sport and physical activity. An important aim of this policy was to inspire as many citizens as possible to get involved in sportive action and to take part in physical activities. However, until the sixties, sport participation was in large part engaged in only by young, capable and achievement-oriented males, mostly from the middle and upper social classes (Bourdieu, 1979; 1991; Gruneau, 1975; Loy, 1969; Lüschen, 1969). In 1966 the Council of Europe had already launched the Sport for All idea, as a result of which Sport for All achieved a pioneer role in the advancement of physical activity among European citizens (Husting, 2003; Scheerder & Vermeersch, 2007). A year later Norway was the first European

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<sup>1</sup> Throughout where reference is made to sport activities, it is based on the wide definition of sport agreed on by the Council of Europe: “Sport means all forms of physical activity which, through casual participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels.” (Council of Europe, 1993). This definition of sport extends beyond traditional team games and incorporates individual sports and fitness-related activities such as aerobics and dance, as well as recreational activities such as long walks and cycling. It extends from casual and informal participation to more serious organised club sport. For the minority it even involves complete commitment in pursuit of the highest level of excellence at world level. This wide and inclusive definition of sport extends its relevance to the whole population and its value as a significant player in the broader social agenda (Rowe, Adams, & Beasley, 2004).

nation to organise a large-scale national Sport for All campaign. Flanders (Belgium)<sup>2</sup> was also an important leader in the Sport for All promotion across Europe, launching numerous recreational sport campaigns in the early seventies. These Flemish promotional initiatives were responded to and followed up at the European level. In 1975 government actions with respect to recreational sport became institutionalised in the form of the European Sport for All Charter (Council of Europe, 1975; 1980). Inspired by the Universal Declaration of Human Rights, this Charter endorses the right to active sport participation for every citizen and was signed by all Council of Europe member-country ministers responsible for sport.

It is evident that societal interest in sport has increased in past decennia, and that sport participation has become one of the most common forms of leisure activity. Crum summarised this trend as the "sportization of society" (1991, p. 15). However, previous research has shown that recreational sporting activity in Europe is both geographically and socially stratified (Hartmann-Tews, 2006; Scheerder & Van Tuyckom, 2007). First, it was found that the sport participation behaviour of Europeans is geographically stratified or differentiated. In particular, there are some apparent differences between North and West European countries on the one hand and South and East European countries on the other hand. In general, sporting participation declines when going from north to south and from west to east. Furthermore, sport participation in the EU and its member states still appears to be socially stratified according to sex, age, income, education, etc. Sociologists define social stratification as a system of social classification in which entire categories of people are ranked in a hierarchy. Individuals are assigned to different social classes and distinct statuses based upon an unequal distribution of

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<sup>2</sup> Belgium is divided into two regions, Flanders and Wallonia, that have considerable independence. Flanders is the part of Belgium which lies to the north of the Dutch-French language border.

valued resources, among which money, occupation, education, an affluent lifestyle, and enjoyable recreational opportunities. Persons with a higher class standing are more likely to consume more of the things that society values than people from lower classes. Sport participation studies generally refute the idea that sport has become more democratic and egalitarian. Empirical research on a national level has revealed that participation in sport activities still reflects the social positions and social stratification patterns that exist in society (see Collins & Kay, 2003; Lamprecht & Stamm, 1995; Scheerder et al., 2002; Scheerder, Vanreusel, & Taks, 2005). These social differences can be summarised as follows: (1) more men than women take part in sport, (2) sport participation is proportional related to age—increasing age, decreasing sport participation, (3) there is a higher percentage of sport participants in groups with a higher socio-economic status (education, profession, income level), and (4) individuals living in (large) towns take part more in sport than those living in villages. To summarise, the subgroups of inactive subjects are women, elderly, individuals with a lower socio-economic status, and people living in villages. Like any other practice, the field of sport activities is, as Bourdieu (1991) emphasizes, "a site of struggle between the social classes".

In the present article we want to explore if the above geographical and social stratification mechanisms are at work with respect to sporting activity in the EU-27 in 2005. To the author's knowledge, it is the first in its kind focussing on stratification from a complete European perspective. Moreover, we want to interpret the levels of sporting activity in the light of other forms of physical activity. Sport is, as previously mentioned, just one of the means to raise physical activity levels among European citizens. Others include the following activities: (i) *occupational physical activity* including job tasks such as walking, carrying/lifting, and other activities of similar exertion at work; (ii) *physical activity through self-powered transport*



including going out to shop or bringing children to school by bike or on foot; and (iii) *household physical activity* including vacuuming/mopping, digging/planting, lifting/carrying, and other chores of similar exertion. Therefore, with respect to the social stratification of sporting activity, we hypothesise that the subgroups explained above will compensate for their sporting inactivity by being physically active in other domains. In particular, we expect that women do household chores instead, or have more physical activity through self-powered transport. Also, the elderly might do gardening as physical activity and individuals with a lower socio-economic status might have higher levels of occupational physical activity. Finally, subjects residing in villages might compensate for their sporting inactivity with higher levels of household physical activity. The examination of these specific subgroups of inactive individuals is important as these groups should be specifically targeted.

To summarise, the purpose of the present study is twofold. We want to gain insight into (1) the *geographical stratification*, and (2) the *social stratification* of physical activity in the 27 European member states based on the most recent data available. Special attention goes to the place of sporting activity in comparison to other forms of physical activity. By doing this we intend to develop a picture of physical activity—in particular sporting activity—within the European Union, and we intend to verify whether low sporting participation levels are counterbalanced by other pieces of the total *menu of physical activities*. The first section of this article describes the problem of comparative research into physical activity and the research material used for the analyses. In the second section, the results with respect to the geographical and social stratification of physical activity are presented. Finally, the third section discusses the results in greater detail and provides some future research and policy recommendations. The results of this study along with consensus of previous findings will strengthen public health and

sport research, practice and policy aimed at targeting specific subgroups of the European population for physical activity promotion interventions and (awareness) programs.

## **Data**

### ***Comparative research into physical activity***

Europe has a tradition of mapping out physical activity based on scientific research from European member states. This, an approach aimed at enhancing a stimulating sports policy both on the European level and on the level of the individual member states. For example, at the end of the seventies and the beginning of the eighties, Rodgers (1977; 1978) and Claeys (1982b; 1982a) conducted a study of the sport behaviour of European citizens, commissioned by the European Council. Two decades later another European project, the COMPASS (CO-ordinated Monitoring of PArticipation in SportS) study (COMPASS, 1999; see also Gratton, 1997; Rossi-Mori et al., 2002), showed the sport participation of 7 European member states by means of comparable and adjusted questionnaires. In addition to these 7 countries, the COMPASS study also included 20 other countries that had data on physical activity available; however, the figures provided did not allow for cross-national comparisons.

More recently, the Dutch Mulier Institute carried out a study, commissioned by Nike Europe about active physical activity in Europe (Van Bottenburg, Rijnen, & Van Sterkenburg, 2005). This study provided an overview of research into sport participation in the (formerly) 25 member states of the European Union. However, this research was based on secondary source material, so results from the various countries are not comparable. The European Commission (in particular the Directorate-General for Education and Culture), like the private initiatives mentioned earlier, conducted an examination of the sport participation and physical activity of European Union citizens by means of the Eurobarometer survey series (European Commission,

2004; 2005; Papacostas, 2005; Soufflot de Magny, 2003). Since these surveys apply standardised measurement instruments, they do allow for cross-national comparisons between the different European member states.

### ***Research material***

Eurobarometer 64.3: Foreign Languages, Biotechnology, Organized Crime, and Health Items is the most recent Eurobarometer survey in which not only sport participation (as in: European Commission, 2004) but also other forms of physical activity was assessed (Papacostas, 2005). It was carried out in November 2005 at the request of the European Commission, Directorate-General Press and Communication Polls and covers the population of each of the EU member states aged 15 years and older ( $N = 26,688$ ). The survey was also conducted in Bulgaria and Romania, an interesting detail since at that time they were still preparing for accession to the EU. A multistage random sample design was applied in all countries and all interviews were conducted face-to-face in people's homes, in the appropriate national language. With respect to the data capture, CAPI (Computer Assisted Personal Interview) was used in those countries where that technique was available (Papacostas, 2005). In each member state, at least 500 (Malta) and at most 1,557 (Germany) interviews were conducted.

Eurobarometer 64.3 (2005) assesses overall physical activity in four different domains by means of the following question: "In the last 7 days, how much physical activity did you get (1) at work; (2) when moving from place to place (self-powered transport); (3) from work in and around the house (including housework, gardening, general maintenance or caring for your family); or (4) from recreation, sport and leisure-time activities?" The answer categories are (i) a lot, (ii) some, (iii) little, and (iv) none. In the present paper, the original question is dichotomised whereby respondents who answered "none" are defined as not physically active; those who

answered “a lot”, “some” or “little” are defined as physically active (*PA*) in a particular domain. This implies that no conclusions can be made with regard to the intensity or duration of physical activity. Consequently, the four resulting dichotomous items (*occupation, transport, household, and sport*) are compared across the 27 EU countries. In addition, they are related to the following four background variables:

- *Gender*: men versus women
- *Age*: (i) 15- to 24-year-olds, (ii) 25- to 34-year olds, (iii) 35- to 44-year-olds, (iv) 45- to 54-year-olds, (v) 55- to 64-year-olds, or (vi) 65 years old and older
- *Education (age when finished)*: (i) younger than age 15, (ii) between age 15 and age 17, (iii) between age 18 and age 21, or (iv) after age 21
- *Social-geographical status*: (i) living in a rural area or village, (ii) living in a small- or mid-sized town, or (iii) living in a large town

To get an initial picture of the four physical activity variables with regard to the social stratification mechanisms, several bivariate analyses were performed. The results of the analyses are presented by means of cross tabulations. Pearson  $\chi^2$ -test statistics are used to test the hypothesis of no association between columns and rows in tabular data, or in the case of this study, no association between the independent and the dependent variables. A  $\chi^2$  probability of 0.05 or less is interpreted as justification for rejecting the null hypothesis that the row variable is unrelated (that is, only randomly related) to the column variable, or for accepting the alternative hypothesis that the row and column variables—or independent and dependent variables—are related to each other.

## Results

### *Geographical stratification of physical activity*

Figure 1 shows the physical activity scores in the four sub-domains (sport, occupation, transport, household) for all EU-27 member states, ranked according to their sporting activity levels. From Figure 1 it seems that on average, 61% of the European citizens aged 15 or older indicate some sort of physical activity from recreation, sport or leisure-time activities in the last 7 days.

Occupational physical activity is mentioned by 54% of the respondents. Nine out of ten Europeans, on the other hand, have indicated being physically active when moving from place to place and from working in and around the house.

### **Insert Figure 1 about here**

There seem to be substantial inter-country differences only in physical activity from recreation, sport or leisure-time activities and occupational physical activity ( $\sigma^2_{(\text{sport})} = 118.748$ ;  $\sigma^2_{(\text{occupation})} = 116.676$ ;  $\sigma^2_{(\text{transport})} = 26.649$ ;  $\sigma^2_{(\text{household})} = 14.325$ ). This lack of variance in physical activity from self-powered transport and housework is due to the extremely high percentage of respondents who answered affirmative to these two questions. With respect to sporting activity, however, we notice striking differences between the European member states. This is congruent with results from previous studies into European sport participation (Hartmann-Tews, 2006; Scheerder & Van Tuyckom, 2007). Figure 2 shows Finland as the most active sporting nation. More than 8 out of 10 Fins age 15 and older are engaged in active sports. Remarkably, in contrast with the research from 2004 in which sporting participation was assessed by means of the question "How often do you exercise or play sport?" the other Scandinavian countries are not among the leaders in the present survey. Sweden (71%) and Denmark (62%) are merely in 8th and 13th place, respectively. Portugal and Romania are last with only 4 out of 10 citizens being active in sports.

In general, sporting activity declines when moving from north to south in Europe. Citizens from more northern locations and from Scandinavian countries exceed their continental colleagues from the Mediterranean Sea area. In addition, East Europeans generally score less well in the sportive sphere than West Europeans. The exceptions, however, are Slovenia and to a lesser degree the Czech Republic and Bulgaria.

As already stated, it is difficult to compare sport activity scores with those of physical activity when moving from place to place and from working in and around the house since these two variables lack inter-country differences. Consequently, Figure 2 shows the physical activity scores with respect to sport and occupation for all EU-27 member states.

**Insert Figure 2 about here**

This figure shows that the *physical activity compensation mechanism* as hypothesised in the light of social stratification is not at work here. On the contrary, it seems that countries with higher levels of sporting activity have higher levels of occupational activity as well (Pearson  $r = 0.551$ ,  $p < .01$ ). This is clearly noticeable for countries such as Lithuania, Austria and the Netherlands which have percentages of 67%, 65% and 76% with respect to occupational physical activity. However, there are some exceptions. Finland for example—the “sportive leader”—has only 56% of her citizens being physically active at work, Germany only 49%.

***Social stratification of physical activity***

Table 1 presents the physical activity levels according to certain background variables. With respect to sporting activity, differences occur according to sex, age, educational level and socio-geographical status. First, more European men than women seem to be actively involved in sports. Whereas 66% of the European men aged 15 or older are active sport participants, the number decreases by 8% for their female counterparts. Second, age also seems to be a strong

determinant of sporting activity in the EU-27. As age increases, sporting activity decreases.

Almost 80% of the 15- to 24-year-old Europeans are physically active, in contrast to merely 45% of the 65-year-olds. Third, sport activity clearly increases with additional years of education. Of the European citizens who finished school after the age of 21, 69% are active in sport, in contrast to 39% of those who finished school before the age of 15. Finally, socio-geographical status is a determinant of sporting activity as well. Of the European citizens living in a rural area or village, 57% are active sport participants. This number increases to 63% for people living in a small- or mid-sized town, and to 66% for people living in a large town.

The above results imply that the full democratisation of sporting activity within Europe has not yet been realised. Moreover, the results are congruent with those from previous national and regional studies into sport participation which have shown that in many European countries physical activity patterns are still characterised by social differences (see Collins & Kay, 2003; Lamprecht & Stamm, 1995; Scheerder et al., 2002; Scheerder, Vanreusel, & Taks, 2005).

#### **Insert Table 1 about here**

We also hypothesised that the individuals with low levels of sporting participation would be compensated for by other physical activities, such as household work, self-powered transport, or occupational physical activity. Figures 3 to 6 compare sporting activity levels to other forms of physical activity (occupation, transport and household) for different socio-economic groups. For each category, the percentage of physically actives has been divided by the total percentage of physically actives. For example, with regard to sporting activity and gender, Table 1 indicates that 65.84% of the men participate in sports, compared to 57.96% of the women. In total 61.45% of the European citizens are physically active in sports. To show this difference between men and women more graphically, we divide the percentages for men and women by the total

percentage. This yields the following: for men,  $65.84/61.45 = 1.07$ , and for women,  $57.96/61.45 = 0.94$ . A number higher than 1 implies a percentage above the mean, a number lower than 1 implies a percentage below the mean. We replicate this procedure for all physical activities and all socio-economic groups. This way, Figures 3 to 6 make it possible to graphically illustrate whether physical activity compensation mechanisms are at work in the various inactive subgroups.

Figure 3 shows the physical activity levels according to gender. Apparently women do not compensate for their lower sporting activity levels by occupational physical activity or self-powered transport. However, women do have higher scores than men with respect to household physical activity. This is a first indication of a possible compensation mechanism for women. Although sporting activity percentages are lower for women than for men, women seem to compensate for it through household activities such as vacuuming/mopping, digging/planting, lifting/carrying or other chores of similar exertion. Contrary to our expectation, this compensation mechanism does not hold for self-powered transport such as shopping or bringing children to school by bike or on foot. Figure 4 shows the physical activity levels according to age. Not surprisingly, we see high rates of occupational physical activity for the active population (from age 25 to age 54). However, in contrast to our expectation, the data give no proof of the elderly compensating for their sporting inactivity by being physically active in and around the house. In Figure 5 the physical activity levels are shown according to the level of education. We expected those Europeans with a lower educational level to have higher levels of occupational physical activity than those with a higher educational level. However, this was not the case since the data show higher levels of occupational activity (including walking, carrying/lifting and other activities of similar exertion at work) for those individuals with a



higher educational level. This might have to do with the sample survey which was, unfortunately, beyond our control. Finally, Figure 6 shows the physical activity levels according to socio-geographical status. The data confirm our hypothesis and give a first indication of a possible compensation mechanism for individuals living in rural areas or villages. Although sporting activity levels are lower for rural than for urban subjects, rural individuals seem to compensate for it through household activities such as vacuuming/mopping, digging/planting, lifting/carrying or other chores of similar exertion.

To summarise, it seems that a compensation mechanism for sporting inactivity occurs only in the subgroups of women and rural individuals. Their lower levels of sporting activity seem to be counterbalanced by higher levels of household physical activity. For the subgroups of elderly and individuals with a lower educational level no compensation mechanisms could be found.

## **Discussion**

In Europe, as in the rest of the world, physical activity is associated with a reduction in obesity, all-cause mortality and numerous diseases (Inchley et al., 2005; Kafatos et al., 1999). As a result, regular physical activity is strongly recommended for its health benefits by several organisations, including the European Commission (2007a; 2007b; 2008). The European Union uses a very broad definition of physical activity that includes different contexts of physical activity, among which are leisure-time physical activity or sport, occupational physical activity, household physical activity and self-powered transport. However, many sports have a distinct advantage over other types of physical activity by being sufficiently physically demanding to meet the intensity required for health benefits. Therefore, the present article has paid specific attention to sporting activity and its stratification patterns, based on the most recent Eurobarometer survey

covering the EU-27 ( $N = 26,688$ ). In addition, sporting activity has been interpreted in the light of other forms of physical activity. The results show that on average, 61% of European citizens are active in recreation, sport or leisure-time activities. This means that in 2005, 4 out of 10 Europeans were still not exposed to sporting activity, even by the broad definition of sporting activity used in the Eurobarometer survey. Moreover, our bivariate results are entirely consistent with previous studies (Collins & Kay, 2003; Lamprecht & Stamm, 1995; Hartmann-Tews, 2006; Scheerder & Van Tuyckom, 2007) and show that sporting activity in the EU-27 (2005) is geographically as well as socially stratified. This implies that particular subgroups of non-sportive citizens can be distinguished—South and East Europeans on the one hand, and women, elderly, individuals with a lower educational level and rural citizens on the other hand. This empirically indicated social structuring, differentiation and discrimination in sports participation may possibly be put down to a less advantageous and insufficient opportunity policy. Despite 30 years of the Sport for All movement, contrasts still exist in sports involvement. At the beginning of the 21<sup>st</sup> century active involvement in sports is still related to social position and social class. This implies that the democratization of sports practices is not yet realized. These social differences in sports participation can partly be explained by Bourdieu's (1979; 1991) field theory on habitus and taste. Bourdieu argues that classes pursue a hegemonic battle of 'classificatory struggles' whereby they seek to distinguish themselves from each other by occupation, education, and through commodities which include both objects and experiences such as sports and holidays. Together these elements create a certain 'class culture', or 'habitus' as Bourdieu terms it, which provide the basis for class reproduction and differentiation. The critical part of Bourdieu's work is that this domination remains, but it should be reconceptualised in a world of consumption, i.e. domination is now mediated by 'taste'. According to Bourdieu, sports

are perceived as valued resources to express dominant social values and consequently are used as symbolic codes of taste and style (Scheerder et al., 2002). Our results indicate that the field of sport remains a 'site of symbolic struggle' between the social classes or positions. Those who are poorest in cultural capital are least likely to actively participate in sport generally. However, we hypothesized that certain compensation mechanisms existed, namely that these specific groups would compensate for their sporting inactivity by being physically active in other domains. However, with respect to geographical stratification, no such compensation mechanisms were found. With respect to social stratification, these mechanisms did occur in the subgroups of women and rural citizens. Their lower levels of sporting activity were counterbalanced by higher levels of household physical activity, including vacuuming/mopping, digging/planting, lifting/carrying and other chores of similar exertion. For the subgroups of elderly and individuals with lower educational levels no such compensation mechanisms were found.

The previously mentioned rise in obesity and decline in levels of physical activity have clear and important public health implications. The results of the present study, in particular the identification of inactive subgroups –without compensation mechanisms- within the EU-27 show that there is still a huge challenge to be faced if we are to make Europe an active sporting union. In accordance with the guidance documents of the WHO, the European Union and its member states suggest that to derive a health benefit from physical activity it needs to be of at least moderate intensity for at least 30 minutes a day, 5 days a week (European Commission, 2008). However, outside of sporting activity, the opportunities to promote other types of physical activities are rather limited. Household physical activity and physical activity through self-powered transport were mentioned by 9 out of 10 Europeans already. However, based on these results, no conclusions can be made with regard to the intensity or duration of activity.

Moreover, we need comprehensive knowledge of the underlying structure of the possible compensation mechanisms for women and rural citizens. After all, demographics and many cultural drivers are pushing us towards a more sedentary rather than a more active sporting lifestyle union. An increase in elderly citizens, and a decrease in activity derived through housework and self-powered transport are just two examples. In addition, it is difficult to envisage public intervention policies aimed specifically at promoting gardening or do-it-yourself tasks. Occupational physical activity was indicated by 54% of the respondents, so theoretically there might be room for improvement. However, here again the trend for physically demanding jobs is decreasing. Moreover, apart from using the stairs instead of the elevator, or from jogging during lunch time, it sounds rather ridiculous to formulate government recommendations aimed at increasing the physical burden of jobs. Therefore, we suggest the important contribution of sport to health primarily through the extent to which it contributes towards increasing physical activity, although there is also evidence to suggest that the social engagement aspects of sport are beneficial in their own right. However, from a health perspective, sensitization campaigns should not only focus on traditional channels such as sport clubs, but also on other -not-competitive- forms of physical activity, such as recreational jogging or cycling groups.

One of the major limitations of the present study is that the Eurobarometer questionnaire does not allow us to distinguish between different forms of household work, self-powered transport, or occupational activity. It might be possible that for elderly a compensation mechanism is at work with respect to gardening but not to vacuuming and mopping. Unfortunately, due to the poor quality of the data, these subtle differences could not be scrutinized within the present survey. Furthermore, it is difficult to adequately compare the findings in this study with other studies due to different operationalisations of the different forms

of physical activity. For example, in comparison to several national studies, the present Eurobarometer-survey uses a very broad definition of sporting activity, namely "physical activity from recreation, sport and leisure-time activities" with relatively high sporting percentages as a consequence. Moreover, the data from this study are limited by the lack of assessment of the exact time spent on sporting activity, physical activity through self-powered transport, household and occupational physical activity. As already mentioned, the percentages tell us nothing about the *intensity* of activity. Only subjects who referred having a total lack of physical activity were defined as inactive. However, it must be kept in mind that a high proportion of the people who perform any of the forms of physical activity do not consider it as 'regular' physical activity. This yields an overestimation of the total percentage of subjects being physically engaged. In addition, although the sample size and sampling strategy should provide information that reflects the situation in each country and across Europe, the cross-sectional design used limits the causal inferences that can be drawn from the data, trends and associations should be interpreted with caution. In addition, there may have been some variation between countries in how respondents understood what was covered by the different forms of physical activity. Among researchers there has been a lack of clarity as to what is meant by sport and physical activity (see COMPASS, 1999), and this may be confusing for the general public as well. In addition, with a reference period of 7 days, weather influences might give some bias in the results.

Nevertheless, the present article is the first of its kind to explore the geographical and social stratification of physical activities -based on the most recent large scale survey available- from a complete European (EU-27) perspective and with reference to other forms of physical activity. Moreover, the strength of this article based on Eurobarometer data lies in its relative, not in its absolute character. However, additional (multivariate) quantitative and qualitative research

is necessary to understand the underlying structure behind the possible compensation mechanisms found for women and rural subjects. For example, whether or not compensation mechanisms differ across European member states should be further explored, as well as whether those for women differ according to age, or whether those for rural individuals differ according to gender or age, etc. Moreover, since the geographical stratification of sporting activity could not be explained by the menu of physical activities, future research should include some country characteristics such as the Human Development Index (HDI), GDP per capita, etc., as well as policy-related variables such as the type of welfare state (Heinemann, 2003) and the type of sport policy system (Camy et al., 2004; Petry, Steinbach, & Tokarski, 2004) to explain the geographical variations in sporting activity across European member states.

Because of the previously mentioned high levels of household physical activity and self-powered transport and societal trends towards an inactive society, sporting activity needs to play an important role in the future for *all* inactive subgroups. After all, in order to achieve their proposed target, the European Union will need to get those who are currently doing some *compensational physical activity* to do some or more sporting activity. In addition, they will need to convert a large number of people who do not compensate for their sporting inactivity at all into regular sport participants. For this purpose, necessary resources and key stakeholders not only need to be identified, but more importantly the social and environmental barriers for sport participation need to be addressed, in particular with regard to the identified subgroups of sporting inactive citizens (European Commission, 2008).

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## Tables and Figures

Table 1. Different forms of physical activity in the last 7 days according to gender, age, educational level and socio-geographical status for all EU-27 member states (2005), results of bivariate analyses

Variable	Categories	Percentages			
		sport	occupation	transport	household
	Total	61.45%	53.87%	90.32%	91.20%
Gender	Men	65.84%	61.09%	90.50%	87.75%
	Women	57.96%	48.04%	90.18%	93.94%
Age category	15- to 24-year-olds	79.84%	56.70%	94.07%	85.20%
	25- to 34-year-olds	67.89%	67.76%	91.55%	91.51%
	35- to 44-year-olds	65.24%	71.34%	91.40%	93.22%
	45- to 54-year-olds	60.52%	67.91%	90.39%	93.94%
	55- to 64-year-olds	57.23%	45.16%	90.06%	93.28%
	65 years and older	44.54%	18.22%	86.02%	89.37%
Education	finished before age 15	39.02%	33.50%	86.04%	89.28%
	finished before age 18	56.79%	52.55%	89.48%	92.90%
	finished by age 21	63.94%	63.44%	91.07%	93.11%

finished after age 21    68.62%    58.14%    91.48%    91.74%

Socio-geographical status					
	rural area or village	57.42%	55.44%	89.12%	93.18%
	small- or middle-sized town				
	town	62.67%	53.13%	90.06%	90.63%
	large town	65.57%	52.75%	92.34%	89.29%

<sup>a</sup> all:  $p < .001$ , except for transport and gender:  $p = \text{n.s.}$

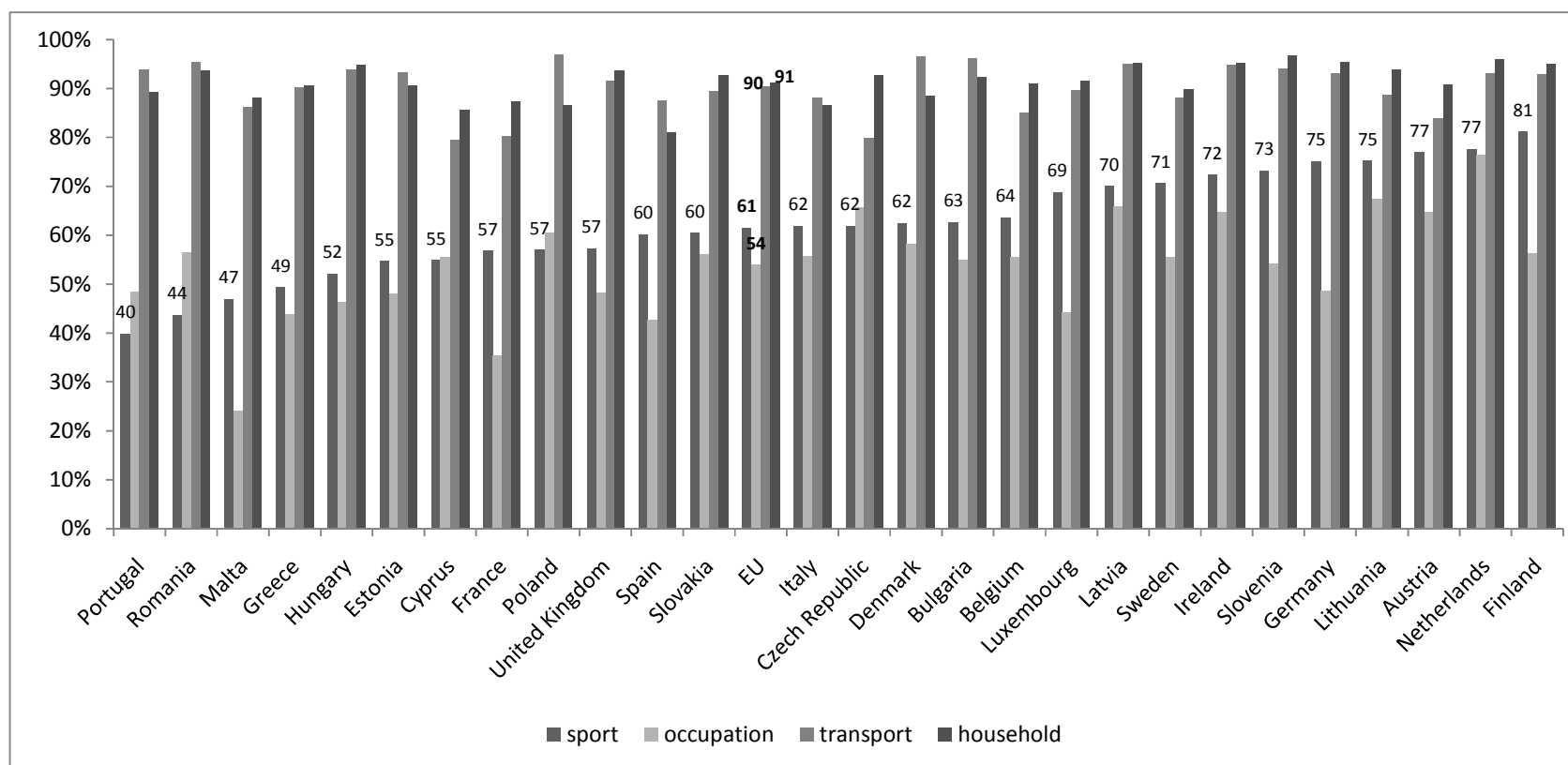


Figure 1. Sporting activity in the last 7 days for all EU-27 member states (2005), percentages in function of total population



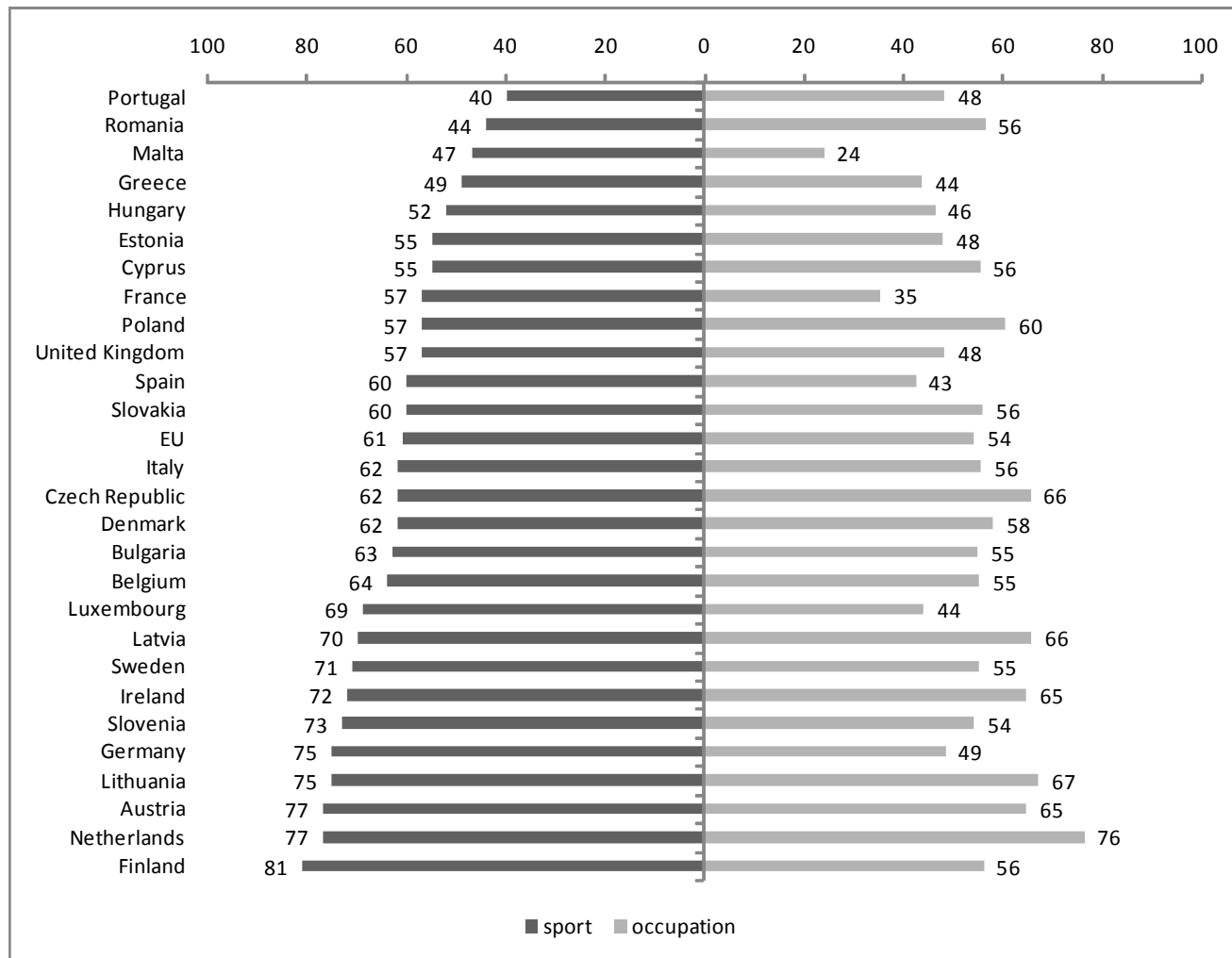
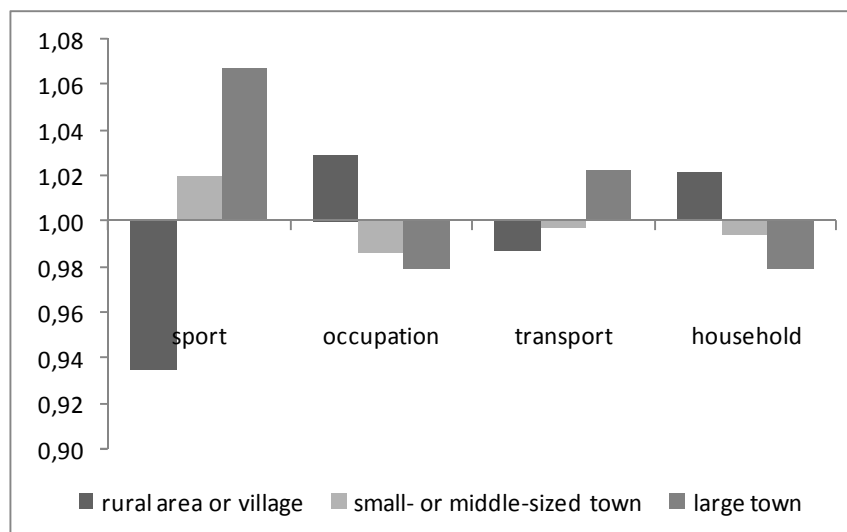
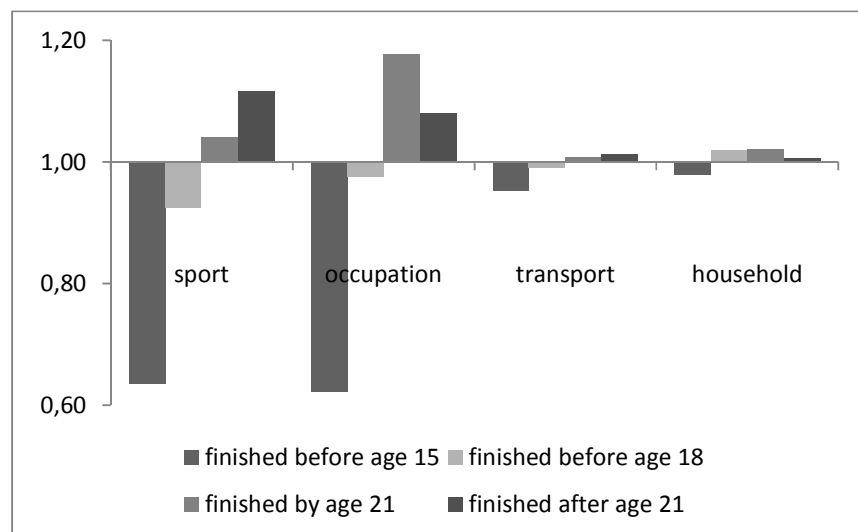
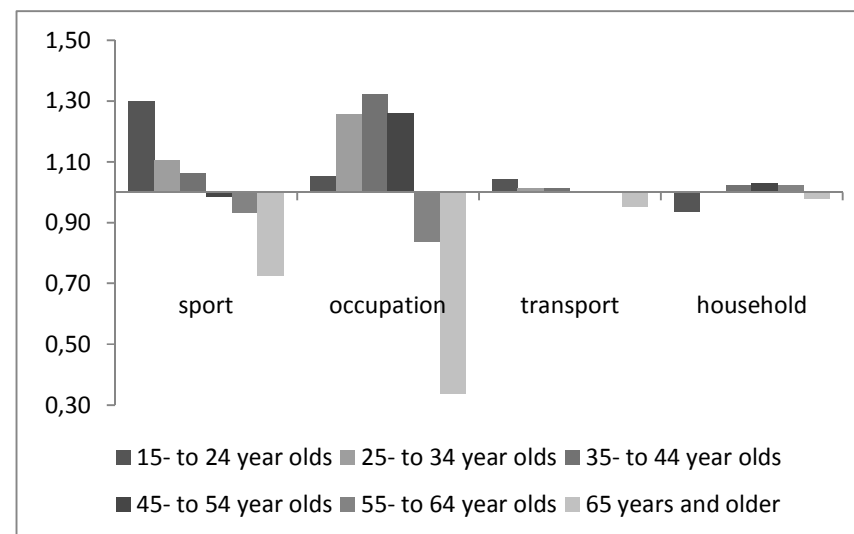
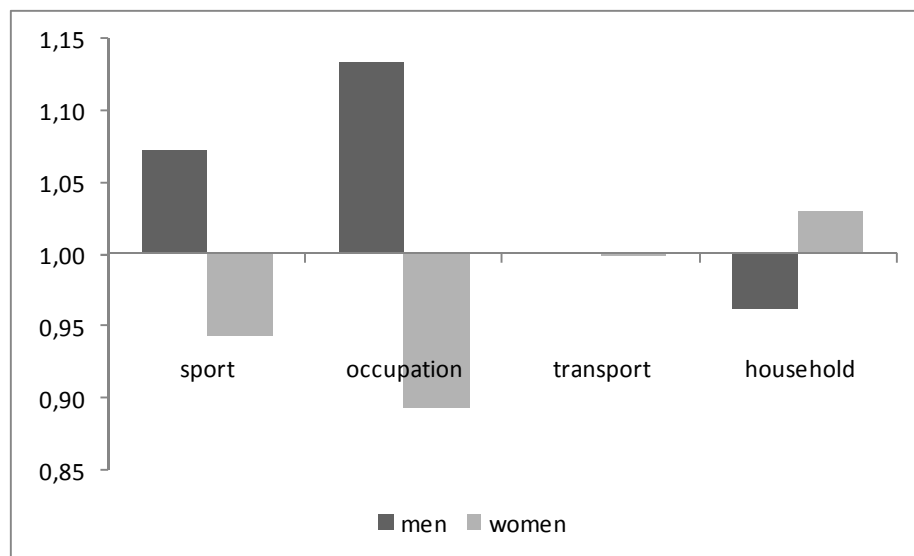


Figure 2. Sporting activity and occupational physical activity in the last 7 days for all EU-27 member states (2005), percentages in function of total population (Pearson  $r = 0.551$ ,  $p < .01$ )



Figures 3 – 6. Different forms of physical activity in the last 7 days according to gender, age, educational level and socio-geographical status for all EU-27 member states (2005), graphical illustration

