Levels and Typologies of Participation in Sports in Europe: Methodological and Operational Challenges

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Abstract: Under the aegis of Lisbon Treaty, individual member states of EU (European Union) are "encouraged to implement evidence-based policies in order to improve their provision of sporting facilities and opportunities". In this framework, a survey (Eurobarometer 72.3) was commissioned by the European Commission, which helps us to understand the behaviour of European societies in the field of participation in sport and in physical activities. In the paper, we measure the levels of involvement of EU citizens in active life styles. We do not analyse issued results, but use the individual record file, reprocessing data in different ways. We try to reconstruct the COMPASS (Co-Ordinated Monitoring of Participation in Sports) general model with the available information. The patterns of participation are studied in relation to the socio-demographic variables. The main result is the individualisation of a "six groups" (six typologies) solution for a cluster analysis of the participants to the survey. The clusters may be so labelled: occasional sport engagement; active participation; intensive open air activities; fitness world; traditional sport world; non active people. We find strong differences in the levels of participation among EU countries, whose determinants are both motivational and socio-demographic, and are linked to the national sport policies.

Key words: Sport participation, surveys, clusters, ranking, sport policies.

1. Introduction

For many years, the role of sport and physical activity in policy actions related to the establishment of the European Union has been marginal. After occasional indirect interventions, even with strong effects such as the so-called "Bosman Judgment" in 1995 based on the view that sport is subject to community legislation only as an economic activity, in recent years there has been a different political commitment by the European Union to such a sector.

It is the turn of the new millennium that characterizes this different approach: starting from the "Report on Sport" in Europe [1], through to the helsinki conference, the declaration of nice [2], the "white paper on sport" [3] and other activities, and, as formalized by the Treaty of Lisbon [4], we can see the community interest in the sport "because of its social

function and the ability to promote shared cultural identity".

Individual member states of the EU are "encouraged to implement evidence-based policies in order to improve their provision for sporting facilities and opportunities", sport and physical activity improve health, physical well-being, social cohesion and educational values. In particular, the starting point of these goals is the white paper on sport that seeks "to give strategic orientation to the role of sport in Europe".

In this framework, a survey on Sport and Physical Activity was commissioned by the European Commission: Eurobarometer 72.3. This survey was conducted on October 2009 and the results were published in March 2010. It was requested by the Directorate General for Education and Culture, and coordinated by the Directorate General for Communication (Research and Political Analysis Unit) of the European Union. Given this new data source and considering the new different role of the sport in the

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society, the aim of this work is to answer to different research questions:

• How should Eurobarometer surveys be used to study sport participation in Europe? And, related to this one, which are the best strategies to process and analyse data on sport participation in different countries and in different times?

• Which are the patterns of sport participation in the enlarged European Union (27 state members)?

The organization of the paper is as follows: After this brief introduction, in Section 2, we propose a short historical overview of the studies and strategies used in the past; in Section 3, we present the data and the different methods used to answer to our specific research questions; Section 4 proposes the results, and Section 5 provides a concluding summary, with a short discussion on the results.

2. Theoretical Background

2.1 History

At the end of the seventies in many European countries we find research on sport demand, which is population behaviour in sports participation. This research analysed: participants and the way they participate; the social pattern of participants; motivation for participation and for non participation; ranking of sport activities; and so on. This approach was necessary to evaluate the characteristics of sport supply to optimize resources and to rationalize choices of sport policies.

Why did we need such an approach? Because, sport always changing in those years. The modern sport, based on organization, selection, competition, membership, measures, ranking, and so on, was reducing its space with respect to post modern sport. We can characterize post modern sport with two different and opposite sectors: a sport show sector, whose models replace the principles and rules of sport with those employed in the business world, and a sport for all activities sector, where millions of citizens participate with different, individual models, looking

for new relationships with one's body and environment. From a sociological point of view [5], these labels are too vague, but they are effective for our goal, which is to measure participation in these various activities.

This complexity represented a new challenge for statisticians, when they tried to measure and to compare levels and typologies of participation in old and new sports activities.

In those years, the Council of Europe was a driving force and many researchers tried to monitor the changes and to measure levels and characteristics of participation in sports under this umbrella [6-10].

Starting from this point, many countries organised surveys for monitoring their citizens' participation in sports, but each country with its own methodology of surveying. It was only in 1996 that a common project was launched: It was the Anglo Italian project COMPASS (Co-ordinated Monitoring of Participation in Sports) [11-14].

2.2 COMPASS and Other Strategies

COMPASS was promoted by the Italian Olympic Committee, UK Sport and Sport England; several experts (key-contacts, who were managing surveys in European countries) were involved in the project, with the goal of making accessible shared statistical criteria and comparable data.

The idea of the project was supported, from one side, by UNESCO (United Nations Educational, Scientific and Cultural Organization) (FCSs (Framework for Cultural Statistics)) with improvements that were developed within the European Union (LEG (Leadership Group for Cultural Statistics)). The EU-LEG group of experts decided not to deal with sport, but suggested a co-ordinated action in this field.

From another side, the COMPASS strategy started with the debate in the Sports Statistics Committee of the ISI (International Statistical Institute): in two meetings in Florence [15] and Beijing [16], experts from various countries agreed to work to improve the

quality of national sports statistics and to develop a suitable methodology to enhance international comparisons.

The main goal of the project was to examine existing systems for the collection and analysis of sports participation data in European countries. COMPASS aimed at promoting the harmonisation of these statistics by persuading countries to adopt some aspects of a common methodology in the collection of survey data. Thus greater comparability of data from different countries would become possible.

A crucial point is that the data we are concerned with, in COMPASS, are those collected in national sports participation surveys, which use questionnaires to collect information on a range of specified sporting activities, over a specified period of time.

This is not the only strategy to collect data for this aim. In fact, the strategies followed so far with the aim of comparatively analysing the trends of participation in sport can be traced to two trends: one that begins with an analysis of data from national surveys and the other which begins from supranational survey data analysis. In the first case, the conceptual framework is different: questionnaires, sampling strategies, age limits, year of survey, etc. In the second case, such differences are annulled, as the survey takes place simultaneously, with the same questionnaire and with the same methods [17].

A cost/benefit analysis of the two strategies would therefore prefer the supranational approach. The national approach, however, has the advantage of being more respectful of cultural differences as it takes into account the sporting traditions of each country. These traditions level out, with respect to concepts, definitions and unique questions, in the supranational case. This case also suffers—as we will see later—from problems deriving from the translation of the questionnaire into different languages.

The supranational approach is also very expensive and the small number of units sampled in each country does not allow for disaggregated analysis on a national

level with respect to structural variables such as age, education level, region of residence, and so on. Consider the difference between the abundance of the Italian stratum in the European Euro barometer (about 1,000 units) and the multipurpose survey "Leisure and culture", which is the one, in such a country, dedicated to monitoring participation in sports and physical activities (approximately 54,000 units) [18].

Returning to the strategy of comparing analysis of the different national surveys, it should also be recognised as a mere collection of the existing data, i.e., the analysis of the results of non-homogeneous surveys in various states presents important issues of validity. Such a limit was partially present in Rodgers' experience (1978) and is very strong in the recent approach of the fact sheet proposed by the MEASURE (Meeting for European Sport Participation and Sport Culture Research) experts group [19].

Fact sheets are standardised forms that include questions on the methodology used in national surveys, the characteristics of the sampling strategies, the rates of sport participation and membership, the favourite disciplines, and the trends of such indicators. The sheets are compiled by researchers/experts in the area of sports in various countries [17].

The approach, of great interest and benefit in order to have the situation of the comparative characteristics of surveys on participation in sport, loses its validity when it wants to compare levels and trends of the studied phenomenon, as it is affected by the subjectivity of the expert's choices in relation to sources and his/her views on the definitional and conceptual apparatus behind the various investigations.

Quite different is the COMPASS strategy, which aims to harmonize the investigation, or to give directives to ensure that certain requirements in the same conceptual and methodological aspects are met and to certify their statistical validity.

In waiting, then, for a "new" project COMPASS, we must be satisfied with a survey such as the supranational Eurobarometer 72.3. Even in the analysis

of its results, it will be seen, however, that the COMPASS strategy can be used to absorb some of the faults of this survey.

3. Methodologies and Data

To reply to the main research questions, we need to follow two different methodological strategies: They will be now introduced, after a critical overview of the data (Subsection 3.1). As for the first question we will simply reprocess Eurobarometer data, applying the COMPASS general model strategy, suggesting different indexes that could be valid indicators of the national trends in sport participation (subsection 3.2); as for the second one a multivariate analysis strategy will be applied to the record file to individualize different typologies of sport participation among European citizens (subsection 3.3).

3.1 The Data: The Eurobarometer Surveys

It was already recalled that the starting point for the goal of improving sport policies in the European countries was the 2007 White Paper on Sport and that in this framework a survey was commissioned by the European Commission to understand the behaviour of European societies in the field of participation in sport and in physical activities. This is the Eurobarometer 72.3, in which 26,788 European citizens were interviewed in 27 countries between October 2 and October 19 2009, by TNS (Taylor Nelson Sofres) Opinion & Social [20].

Eurobarometer surveys are useful tools for measuring raw trends of participation, as they give us the possibility of discriminating its levels, to individuate its determinants and to analyse its key drivers only at an aggregate European level. The first limit, in fact, is that in each European country the sample of interviewed people is between 500 and 1,000 units, Such a sample is too small to estimate levels of participation in particular subgroups of population (e.g. young males, graduates and so on). Nevertheless, the trends could be monitored in a correct way at the

European level, if some questionnaire limits did not introduce more problems.

The two key questions in English are "How often do you exercise or play sport?" (Q1) and "How often do you engage in a physical activity outside sport such as cycling or walking from one place to another, dancing, gardening ...?" (Q2).

In French, the situation is rather different: "Tous le combien faites-vous du sport ou de l'exercice physique?" (Q1). It is true that the second question ("Et tous le combien exercez-vous une activité physique qui ne soit pas du sport, comme faire du vélo, marcher d'un endroit à un autre, faire du jardinage ...?" (Q2)) leaves out any kind of sport activities, but many interviewed persons could have considered their participation in a physical activity by replying to the first question!

Moreover, which is a sport activity and which is a physical activity? It is a subjective choice that depends on the sport culture of the country you live in, not only on the individual opinion.

The third problem: respondents' classification with respect to participation is so coded: "5 times and more a week" (regularly); "3-4 times a week" (with some regularity); "1-2 times a week" (with some regularity); "1-3 times a month" (seldom); "less often" (seldom); "never" (never); "do not reply" (missing). So participating 3-4 times a week is not considered regular as in the new WHO (World Health Organization) statement (see subsection 3.2); in the official results, the second and third items are presented together.

As regards the first and third problems, it is possible to overcome them only through using the individual's record file to reprocess data. In fact, if we want to measure the levels of involvement in active life styles, in opposition to the levels of sedentary life styles in the various countries, we have to analyse both the items (Q1 and Q2) in a joint way and this is possible if we consider the crosstabs obtained with the replies to the two questions (Table 1). We will analyse this table in Section 4.

Table 1   Contingency table (total %): Q1: How often do you exercise or play sport? *Q2: How often do you engage in a physical activity?

		Q2 And how often do you engage in a physical activity outside…?							Total
		5 times and more	3-4 times a week	1-2 times a week	1-3 times a month	Less Often	Never	DK	
Q1 How often do you exercise or play sport?	5 times and more	6.8[a]	0.9[a]	0.9[a]	0.1[a]	0.3[a]	0.4[a]	--	9.4
	3-4 times a week	2.9[a]	5.3[a]	2.3[a]	0.5[a]	0.5[a]	0.3[a]	--	11.8
	1-2 times a week	4.1[b]	3.2[b]	8.4[c]	1.3[c]	1.0[c]	0.5[c]	--	18.5
	1-3 times a month	1.4[b]	0.8[c]	1.7[c]	1.9[d]	0.3[d]	0.2[d]	--	6.3
	Less often	2.8[b]	1.8[c]	2.6[c]	2.0[d]	4.7[e]	0.6[e]	--	14.5
	Never	9.0[b]	4.8[c]	5.7[c]	2.8[e]	4.0[e]	13.0[f]	--	39.3
	DK	--	--	--	--	--	--	0.1[g]	0.1
Total		27.2	16.8	21.5	8.7	10.8	14.9	0.1	100.0

3.2 COMPASS General Model

The key aspects, that were dealt with in COMPASS, are the following: to give a conceptual and operational definition of sport, to be adopted as a common reference; to define the general model to characterise the participation (quantity, quality and organization) and to apply it (analytical framework) to the various surveys; to give suggestions to solve the statistical and methodological problems that may arise; to identify a minimum package of national outputs (tables, graphs) which are necessary for the comparative data processing.

As to the problem of giving a common definition of what sport may be, it is not worth considering the complex conceptual problem, from an operational point of view it was the definition proposed in the European Sports Charter [21] that was chosen: "Sport means all forms of physical activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competitions at all levels".

As to the second point, the goal was to identify the major characteristics of participation. The three basic components identified for the general model are: a quantitative component (that is, how frequently do you participate in sports activities?); a qualitative component (that is, at which level do you practise?); an institutional (organisational) component (that is, is your practice involved in a club or association?).

These may be considered as latent variables, which can be measured through a set of indicators (proposed in a questionnaire) that may be partially different from country to country, in accordance with each country's different traditions and different kind of sports organisation.

COMPASS proposes to standardize the components, so as to unify their meaning: this fact must be considered as crucial, as in this way it is not necessary to have a common survey with a common questionnaire.

The general model was established according to the possibility of measuring the components. It was impossible to apply it to surveys performed in the previous years, so the choice was to simplify the approach, using the analytical framework, compatible with the general model, and based on a rough measure of the components, as follows: quantity was measured by the frequency of participation (how many occasions over a year?); quality related simply to whether any of the previous occasions was competitive or not; organisation related simply to whether any occasion of participation was as member of a sports club or not.

The synthesis of the analytical framework is proposed in Table 2, where in the lines there are the levels of participation that characterise the COMPASS strategy: in this way, each activity is defined with levels of components and it is easy to distinguish among sports and physical activities.

Table 2   COMPASS analytical framework.

Levels of participation	Quantity (Frequency in a year)	Quality (Competition)	Organization (Membership)
1. Competitive, organized, intensive	≥120 times	Yes	Yes
2. Intensive	≥120 times	Yes	Not
	≥120 times	Not	Yes
	≥120 times	Not	Not
3. Regular, competitive and/or organized	≥60 & ≤120	Yes	Yes
	≥60 & ≤120	Yes	Not
	≥60 & ≤120	Not	Yes
4. Regular, recreational	≥60 & ≤120	Not	Not
5. Irregular	≥12 & ≤60	---	---
6. Occasional	≥1 & ≤12	---	---
7. Non participation	Never	No	No

There were more methodological problems, operational and conceptual ones, to consider in comparing data from different surveys following the COMPASS approach: how to draw up the questionnaire and how to administer it (CATI (computer aided telephone interview), CAPI (computer aided personal interview), proxy, face to face and so on); the definition of the list of sports and physical activities; the use of a prompt card, or not; the certification of the statistical bodies responsible for the survey; the age limits of the citizens to be interviewed; the sample strategy and its size; the period of reference, and so on [22].

The sports participation patterns established by COMPASS have been confirmed in all research carried out at international level in the last decade (2002-2011) [12]. But new studies present the need to take account of the new policy emphasis on the measure of a more intensive participation.

In fact the increasing attention on health issues leads to a focus of attention on frequency and intensity of sports participation. Some researchers suggest that the frequency and the intensity should form the core of the new model without paying attention to club membership and to competition.

This lack of interest in the quality and organisation components may be dangerous, as these two components should be used for a better characterization of sport participation in the various

countries. Without such, it will not be possible to distinguish sports activities from physical ones. This suggestion may be accepted only for the computation of basic indicators measuring active life style of citizens.

The new suggestion comes from the fact that in many countries, at the moment, the main indicator of sports participation used by policy bodies has changed to "at least 3 times a week for a duration of at least thirty minutes", as proposed by WHO [23]. This new threshold has come about because health research has indicated that this is the minimum intensity of sport activity that will significantly contribute to health status.

Thus this statement may led to a change in some COMPASS levels: for instance the first two levels could be changed from "intensive" to "regular" participation and 3rd and 4th from "regular" to "almost regular"; 5th and 6th could characterise "irregular" participation, with the following changes in the analytical framework (Table 3).

3.3 The Multivariate Analysis

With the strategy proposed many other original analyses may be applied to Eurobarometer data, to take more information on sport participation.

In fact, the main contribution of COMPASS is the attention paid to important features of sport participation, that are competition and membership in a

Table 3   COMPASS analytical framework (revised).

Levels of participation	Quantity (Frequency in a year)	Quality (Competition)	Organization (Membership)
1. Regular sport	≥150 times	Yes	Yes
2. Regular recreational	≥150 times	Yes	Not
	≥150 times	Not	Yes
	≥150 times	Not	Not
3. Almost regular sport	≥60 & ≤150	Yes	Yes
	≥60 & ≤150	Yes	Not
	≥60 & ≤150	Not	Yes
4. Almost regular recreational	≥60 & ≤150	Not	Not
5. Irregular	≥12 & ≤60	---	---
6. Occasional	≥1 & ≤12	---	---
7. Non participation	Never	No	No

sports club, association, and so on. In the survey, we are analysing these features are only partially considered. That is, there is a question (with the possibility of multiple responses) "where do you engage in sport or physical activity?" that may characterize the kind of sport that people exercise or play. There is another question on the membership (multiple responses), that is "are you a member of any of the following clubs where you participate in sport or recreational physical activity?", with the following possible responses: "health or fitness club", "sports club" and "socio-cultural clubs". Other pertinent questions are: "do you engage in voluntary work that supports sporting activities?" and "how much time do you spend on voluntary work in sport?".

All these questions may characterize sport participation and thus the second step was to perform a multivariate analysis strategy (multiple correspondence analysis, with cluster analysis on principal dactor scores) on all these variables, to extract general typologies that can represent the different profiles of European citizens' approach to participation in sports and in physical activities.

The aim of the two-steps strategy is the following: the first step allows the study of the relationships of several categorical independent variables, reducing the size of the original matrix data and identifying the relationships of interdependence between the original variables, which are summarized and represented in

factors; factors are continuous variables and each unit has a factor score, that is used in the second step (cluster analysis) to individualize different groups with similar characteristics within the groups and different characteristics between them, so the "N" statistical units are reduced and classified in "c" subgroups or clusters, where c << N. The combination of the two steps allows us to classify individuals in a number of homogeneous groups [24, 25]. We implemented these procedures in SPAD.N (Système Portable pour l'Analyse des Données) [26].

This strategy allows us to characterize the factors and the groups with other variables, that we call "supplementary" (out of analysis); these play a different role with respect to the ones previously used to individualize factors and groups, that we call "active" (in analysis). The active variables are the ones regarding the characteristics of sport participation; the supplementary ones are the social, demographic and economic variables and those related to attitudes toward sport policies and to motivations.

4. Results

4.1 Reprocessing Data According to COMPASS Model

If we try to reconstruct a COMPASS-like model, starting from the results proposed in Table 1, we propose that people who participate 3 and more times a week in a sport activity may be placed in COMPASS groups 1 and 2 (more than 150 times a year), according

to the new classification proposed in Table 3; the difference inside these two groups is owed to the way in which people participate (competition or not, membership or not). This first group (A1) corresponds to the first two lines of Table 1 [a].

People who exercise or play sport less frequently, but engage in a physical activity almost every day, may be placed in the same group (A2), according to the COMPASS model: the pertinent percentages are marked with a [b]. To this group, we can add people who participate in sport 1-2 times a week and more often in a week in a physical activity.

A third group (B), that matches COMPASS groups 3 and 4 (1-2 times a week; also in this case the difference inside COMPASS groups is owed to competition and membership), corresponds to the rest of the people who participate in sport 1-2 times a week, to those who participate in sport 1-3 times a month, but are involved more often in physical activities and those who participate regularly (3-4 times a week or more) in physical activities: this group is marked with a [c].

The rest of the cells may easily be matched with the other COMPASS groups: a C group [d] corresponds to COMPASS 5, a D group [e] to 6 and the E group [f] (the last cell in the bottom to the right) to 7. As to the missing values (DK), we consider such options only for people who did not reply either to Q1 or to Q2, as in other cases the hypothesis is to substitute "never" with "no reply" [g].

The results proposed in Table 4 may be new COMPASS levels, identifying the following characteristics: A1—regular sport activity; A2—regular physical activity; B—almost regular activity; C—irregular activity; D—occasional activity; E—no activity.

The first thing to note is that only 13% of the EU population has a completely inactive behaviour, a lifestyle that is definable as sedentary. It is an outcome, of course, inferior to the 39.2% of non-sportive population (on the responses to Q1), but also inferior to the 14.4% of non-active (on the responses to Q2), as proposed in the official report of the Eurobarometer.

The rate of non-response is reduced to 0.1%, and can be considered as such only by those who did not want to express themselves both on Q1 and Q2. We can reasonably assume that those who responded positively to one of the two questions (which means that they practice a sport or an activity), and did not respond to the other, because they do not engage in any activity related to the item that is not responded to (sports or physical activity).

Comparing the result of such classification in the 27 countries is rather interesting, as we can study trends from a sport oriented point of view or from an active life style point of view (Table 5).

The results may in fact be read according to different rankings: that of the regular participation predominantly with sport features (A1), of the regular participation (A1 + A2), of the active lifestyle (A1 + A2 + B), of the sedentary lifestyle (D + E), of the failure to practice (E), and so on.

Table 4   COMPASS model recoding.

		Percentages	Valid percentages	Ex COMPASS
	A1 [a]	21.2	21.2	1-2
	A2 [b]	20.6	20.6	1-2
	B [c]	20.4	20.4	3-4
Groups	C [d]	12.6	12.7	5
	D [e]	12.1	12.1	6
	E [f]	13.0	13.0	7
	Total	99.9	100.0	
Missing		0.1		
Total		100.0		

Table 5   Contingency table (row%): Country * COMPASS recode.

		COMPASS recode						Total
		A1	A2	B	C	D	E	
	BELG	25.4%	13.9%	22.0%	11.4%	14.1%	13.1%	100.0%
	DANM	33.0%	30.3%	21.0%	9.0%	3.3%	3.3%	100.0%
	DEUT	23.5%	22.1%	26.2%	14.2%	8.6%	5.4%	100.0%
	ELLA	10.3%	13.7%	15.1%	15.4%	19.2%	26.2%	100.0%
	ESPA	27.7%	22.3%	16.4%	11.7%	12.8%	9.1%	100.0%
	SUOM	44.5%	17.1%	21.7%	8.2%	5.7%	2.8%	100.0%
	FRAN	24.3%	24.5%	23.7%	10.4%	7.7%	9.4%	100.0%
	IREL	41.0%	15.7%	16.6%	7.1%	8.4%	11.2%	100.0%
	ITAL	11.7%	6.6%	20.7%	12.3%	18.8%	29.9%	100.0%
	LUXE	27.8%	27.7%	21.0%	9.1%	9.2%	5.2%	100.0%
	NEDE	21.2%	38.5%	24.9%	7.7%	4.4%	3.3%	100.0%
	ÖSTE	15.5%	13.6%	29.6%	21.9%	14.8%	4.6%	100.0%
	PORT	19.1%	14.3%	18.9%	10.0%	10.2%	27.4%	100.0%
Country	SVER	43.8%	26.3%	17.2%	7.7%	4.0%	1.0%	100.0%
	UK	28.8%	23.7%	16.5%	11.5%	9.4%	10.2%	100.0%
	KYPR	29.3%	7.3%	15.4%	7.4%	13.3%	27.2%	100.0%
	CESK	8.5%	16.1%	23.1%	18.3%	22.1%	12.0%	100.0%
	EEST	15.6%	35.0%	20.5%	12.8%	8.4%	7.7%	100.0%
	MAGY	11.1%	36.5%	16.5%	12.8%	13.0%	10.1%	100.0%
	LATV	14.3%	37.7%	18.3%	12.5%	8.5%	8.7%	100.0%
	LIET	21.9%	29.5%	13.3%	8.2%	14.0%	13.1%	100.0%
	MALT	32.7%	14.7%	15.7%	7.5%	9.4%	20.1%	100.0%
	POLS	12.9%	21.6%	18.9%	16.0%	13.2%	17.4%	100.0%
	SLKA	13.6%	25.7%	21.4%	17.3%	14.8%	7.2%	100.0%
	SLJA	27.9%	31.6%	18.7%	9.1%	8.7%	4.0%	100.0%
	BALG	4.7%	24.5%	20.4%	21.0%	23.6%	5.8%	100.0%
	ROMA	14.7%	14.0%	11.8%	13.5%	20.5%	25.5%	100.0%
Total		21.2%	20.6%	20.4%	12.7%	12.1%	13.0%	100.0%

The readers may prefer to build their own rankings: here we report, for each of the proposed rankings, the nations in the top three positions (the podium) and those in the last four positions (the retrocession from sportive Europe).

As for the regular participation in activities with sport features, on the podium are Finland, Sweden and Ireland; at the bottom are Hungary, Greece, the Czech Republic and Bulgaria.

As for the complete regular participation Sweden, Denmark and Finland are in the first position; at the bottom are Austria, the Czech Republic, Greece and Italy. As for those who are active, the first position goes to Sweden, Holland and Denmark, whereas the last ones are the Czech Republic, Romania, Greece and Italy.

As for the sedentary percentages, the ranking is reversed [1]. Therefore, on the podium are Sweden, Denmark and the Netherlands. The last countries are Cyprus, Greece, Romania and Italy. The same goes for the non-practice, which is negligible for Sweden, Finland and Denmark and the Netherlands that are ex aequo; on the last positions, there are Greece, Cyprus, Portugal and Italy.

The result is hardly comforting for Italy, the situation for Greece, the only country always in the last positions, probably reflects the economic crisis that this country is going through, rather than a different cultural approach to participation, which is rather at the basis of the

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[1] The nations with the lowest percentages are placed at the top.

positions of excellence in the Scandinavian countries. Table 5 may be useful to calculate many other indexes, also according to the new WHO recommendations.

4.2 Multivariate Analysis

Multiple correspondence analysis was applied to the matrix of 26,788 units and 13 active categorical variables, with 44 categories. Other than the active variables, there are eight supplementary ones (gender, age (in classes), country, and so on) with 66 categories that were used to characterize the factors and the clusters. The main factors chosen to represent the variability of the responses are the first five that explain more than 50% of the variability: they are used for performing cluster analysis.

The best solution for the cluster analysis is a "six group" one, that explains 84.6% of the total variability (inertia), after the iterations of settlement. A mixed method was chosen, that uses a hierarchical algorithm, applying Ward's minimum variance method, based on a previous non hierarchical aggregation that uses the method of k-means[2].

The first group nearly represents a quarter of the sample (24.05% of units). It represents the occasional approach to sport participation: the percentage of those who reply "less often" to the question on participation in sports is 44.7% vs. 15.4% in the whole sample. There are interviewees that have an occasional approach "less often" to physical activities are also 38.6% vs. 11.1%, but the amount of those who engage in physical activities "3-4 times a week" (40.5% vs. 17.0%) is also higher. This engagement is preferably "on the way home or towards other places" (48.63% vs. 28.34%), "at work" (11.13% vs. 7.62%) and "in a park, out in nature..." (48.57% vs. 44.70%). These units are members of any kind of club and engage in supporting their activities only in very few cases: the reply "never" reaches 97.16% vs. 91.47% in the sample. It is mainly a female group (58.21% vs. 55.73%) and the age class most relevant is 45-54 years old (18.49% vs. 16.71%).

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[2] It is the SEMIS algorithm of SPAD software.

Members are prevalently less educated and the percentages of people self positioning in the lower socio-economic levels is higher than in the whole sample (levels 1-3: 10.09% vs. 8.75%; level 4: 12.67% vs. 11.06%). The countries most involved in the group are: Bulgaria (test value 10.19%), Slovakia (7.57%), the Czech Republic (6.73%), with Spain, Romania, Hungary, Greece and Poland that present test values greater than 2.00. This group may be called the citizens with occasional sport engagement.

The second group is as numerous as the first (23.78%) and is characterised by an almost regular participation: "1-2 times a week" is the reply chosen by 34.7% (vs. 17.4%) with regard to sports and by 56.2% (vs. 20.4%) with regard to physical activities. The absolute majority (59.78% vs. 44.70%) engage in a park, out in nature. In this case too, people's participation is not organised and 95.95% (vs. 91.47%) of the respondents do not support their clubs' activities. It is an urban, young group: the three younger age class percentages are higher than the sample's ones. It is a group with a higher educational level. The countries that characterize it are: Austria (test value 8.29), Bulgaria, the Czech Republic, Germany, France and Finland that present test values greater than 2.00. They are the active citizens.

Thus, the two groups put together represent the irregular approach to sport; the next three groups will include continuous and regular involvement.

The third group is mainly characterised by people who engage in sports "5 or more times a week" (33.2% vs. 10.0%), or "never" engage in sports (47.1% vs. 29.9%) but engage in a physical activity "5 or more times a week" (91.8% vs. 29.7%). This category "5 or more times a week", that represents the most intensive approach to sports and to physical activities, is linked to activities in the open air engaged on the way home, in parks or out in nature, they are not organised neither competitive. It is mainly an adult and elderly people engagement (48.64% vs. 39.87%), so women are the large majority (58.49% vs. 55.73%); its open air features are notable by the fact that people mainly live

in rural areas. The countries with high test values are: the Baltic Republics (Latvia 8.38; Lithuania 8.23; Estonia 7.09), Hungary 8.10, Slovenia 7.21, Denmark, the UK, Spain and Sweden that reach a test value greater than 2.00. They are the citizens with intensive open air activities.

The fourth and fifth groups have the same profile in percentages with regard to the regularity and intensity of participation in sports: "5 and more a week" are 12.7% and 16.6%, respectively (vs. 10% in the sample); "3-4 times a week" are 37.3% and 34.3% (vs. 11.0%); "1-2 times a week" are 42.22% and 40.4% (vs. 17.4%). Hence, the difference is linked to the activities and the way people are engaged: in the 4th group, 86.86% engage in a fitness club (vs. 9.33% in the sample), while in the fifth group, 62.67% engage in a sports club (vs. 7.75%), 24.31% in a sports centre (vs. 5.73%) and 10.26% in a school/university association (vs. 3.76%). So 78.62% in the fourth group are members of a health/fitness club (vs. 7.81%) and 81.14% in the fifth are members of a sports club (vs. 4.05%). In the fifth group, the highest percentages of units that engage in work supporting sports clubs or associations is present. The fourth group is a mainly female one (58.38% vs. 55.73%), while the fifth is the one in which men are the absolute majority (60.58%, while in the whole sample the percentage of men is 44.27%). Both are young groups, with units living mainly in small/medium sized towns or in metropolitan areas (the fourth). The percentages of the highest socio economic levels (from 7 to 10) of both groups are greater than in the whole sample and there we find the highest educational level. The countries more involved in the two groups are: (fourth) Sweden (14.47), the Netherlands (10.65), Denmark (8.59), Italy (6.94), Ireland (6.00) and then the UK, Finland and Germany; (fifth) the Netherlands (13.08), Germany (8.36), Denmark (8.32), France (7.35), Finland (6.68), Austria (6.08) and then Sweden, Ireland and Belgium. These groups may be labelled as the fitness world and the traditional sport world.

The last (sixth) group is easily characterised: they are the sedentary, non active people. So there is no discriminating category in the ones that describe participation in sports or in physical activities. It is a strongly feminine group (60.25% vs. 55.73%) and with a high percentage of old people with 65 years and more (39.51% vs. 23.18%). Also, socio economic and educational levels discriminate the presence in the group, as lower levels received higher percentages than in the whole sample. The countries with the higher presence are Portugal (15.05%), Italy (14.50%), Greece (13.24%), Romania (12.78%), and Poland (7.64%).

4.3 The Perception of the Local Context

The six identified groups have been characterized by the supplementary variables, the structural ones: gender, age, educational level, economic status, and so on; they may also be characterized from other points of view: in particular it may be interesting to evaluate the perception of the local context (opportunities, facilities, and sports policies).

The questions asked in this context refer to the opportunities for participation offered to respondents in the area where they live, especially those offered by sports clubs and other private associations, and the role that local authorities play in such areas. There are also two items related to the attitude of respondents towards such opportunities.

For every item, a Likert scale was provided with an even number of categories ("strongly agree" and "agree" vs. "disagree" and "strongly disagree"), with the possibility, however, not to answer. Hence, in fact, the middle category of a classical Likert scale with five alternatives was recuperated.

The scheme seems to reproduce a classic dichotomy between those who agree and those who disagree. Hence the item was synthesized with a single index of preference, with positive values for groups with a prevalence of agreement on the item with respect to the average situation of the collective, and negative for

those with a prevalence of disagreement[3]. The final scores of five indices are reported in Table 6. Since three questions are set as negatives, the summary index of such items will take negative values in case of a more favourable attitude to participation.

The groups of active sportspeople exhibit the same behaviour, separate from the others, and still group 5 shows the highest scores in absolute values, when compared to those of group 4. Those sedentary, occasional and active complain more about the lack of opportunities (item a and b); on the contrary, those who are sportspeople and those who practice activities tend to organise themselves in the open air. The negative judgment on the local authorities (item e) prevails among the sedentary ones and those occasionally active: this would suggest that, with appropriate sports policies by local authorities, the participation rates could increase. In reality, the differences in item (c and d) on the lack of interest in participation are much more discriminating, and so the attitude of many seems to be negative regardless of the opportunities offered and by sports policies. The single result being in contrast is the one of the sedentary people that, on item c, report the interest in taking advantage of opportunities that they do not have.

The nationality was most discriminatory on such items: in fact the evaluation, although subjective, of opportunities to be physically active in the area is linked to those offered by private clubs and sports policies of local authorities in the member states. Therefore, Table 7 was prepared with five different rankings for states, one for each of the indices calculated on the responses to items from citizens. The rankings are always directed from the more favourable to the least favourable in regard to participation,

regardless of the sign of the index.

To better understand what they mean, it is useful to relate them to each other and with a rate of participation (the coordinate of the country on the first factorial axis is used for this goal). This index has a high correlation with item a (0.74), item e (-0.73) and item b (0.70), but also with item d (-0.63): this means that levels of participation are related to the local organisational situation, to the offer, but also to the cultural approach to participation.

The index obtained from responses to item c, is less valid, perhaps for the bad wording of the question, which involved two aspects: the provision of opportunities and the willingness to use them. The correlations are different among items: very high (0.94) between a and b; a little less strong between a and e (-0.86), probably because in some states we expect more from private clubs with regard to the provision of opportunities; between the a and d is also high (-0.67) to indicate that the cultural approach affects the perception of opportunities for participation; finally the strong relationship (-0.89) between b and e suggests a more organised supply enjoyable where local authorities are more proactive. Obviously these considerations suffer from the fact that the correlation coefficient (Pearson's "*r*") is a mere measure of association and cannot provide information on links of cause and effect.

Returning to the rankings, there is a confirmation of the strongest positions for the Netherlands, Denmark and Sweden for all items (except c), Finland and Ireland move up in ranking on the interest in participation, as well as Germany and Finland on the agreement for sports policies of local authorities. On the lower side, Bulgaria and Romania are almost always in the last position and Italy has a low level in terms of interest in participation and the role of local authorities. Regarding the ranking c, the positions of countries like Romania and Bulgaria, with an interest in taking advantage of opportunities that are present on a reduced size, overlap with those (e.g., Finland) where

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[3] The score was obtained by adding the percentages of those in favour (with double weight for those who declared themselves strongly agree) and subtracting the percentage of those contrary (with double weight for those who declared themselves strongly disagree). For each group score the average, calculated overall collective, was subtracted in order to have positive scores for situations of prevalence of "agreement" and negative for that of "disagreement".

Table 6　**Index of preference for the reasons that prevent participation or a more regular participation (% with respect to the groups).**

Groups > Item	Occasional	Active	Active, open air	Fitness	Sports	Sedentary
(a) Opportunities in the area to be physically active	-15.9	-2	7.4	42	53	-48.7
(b) Opportunities offered by clubs to be physically active	-17.6	-1.4	-5.4	51.6	66	-50.3
(c) I do not care to take advantage of opportunities to be physically active (*)	10.4	20.2	-11.7	-13.9	-27.7	-10.9
(d) I do not care to be physically active (*)	34.3	8.2	-5	-93.6	-101.1	69.7
(e) Local authorities do not do enough for physical activity (*)	8.4	-0.6	0.5	-22.9	-30.4	23.2

(*) Item on which a more positive attitude to participation has a negative sign.

Table 7　**Ranking of countries according to indices calculated on five items on the perception of the local context.**

Country	Item a	Country	Item b	Country	Item c	Country	Item d	Country	Item e
NEDE	89.3	DANM	81.2	SUOM	-44.7	SVER	-62.9	DANM	-67.6
DANM	73.3	NEDE	79.0	ROMA	-33.4	IREL	-39.8	DEUT	-65.3
LUXE	58.2	LUXE	69.2	BALG	-31.7	SUOM	-39.3	NEDE	-64.3
SVER	52.1	SVER	63.8	SVER	-19.2	NEDE	-38.4	LUXE	-63.3
SUOM	49.2	FRAN	58.2	NEDE	-14.5	DANM	-38.4	SUOM	-62.6
DEUT	47.3	DEUT	57.9	DEUT	-13.5	DEUT	-29.7	SVER	-48.7
FRAN	42.8	BELG	54.4	MALT	-7.1	ÖSTE	-28.1	FRAN	-36.8
BELG	34.0	ÖSTE	35.6	POLS	- 5.0	SLJA	-24.7	ÖSTE	-24.4
ÖSTE	32.4	IREL	30.1	PORT	-5.0	MALT	-19.0	EEST	-13.7
SLJA	20.6	SUOM	26.5	SLKA	-3.9	UK	-17.6	IREL	-12.6
IREL	11.6	UK	17.4	DANM	- 3.5	KYPR	-15.6	BELG	-11.9
EEST	5.9	ESPA	17.3	IREL	-2.7	LUXE	-13.1	EU27	0.0
EU27	0.0	SLJA	6.7	CESK	-0.3	EU27	0.0	UK	0.3
LIET	-0.1	EEST	0.7	EU27	0.0	EEST	2.3	MAGY	3.2
ESPA	-0.5	EU27	0.0	UK	3.0	LIET	4.5	CESK	7.6
KYPR	-3.3	ITAL	-10.6	LUXE	3.1	ELLA	4.9	SLJA	13.1
UK	-5.1	MAGY	-13.4	MAGY	5.9	SLKA	8.6	ELLA	13.9
ITAL	-16.6	LATV	-20.2	LIET	7.6	POLS	9.1	ESPA	17.7
MAGY	-20.4	CESK	-33.4	EEST	12.0	FRAN	12.3	LATV	24.8
LATV	-27.1	KYPR	-34.2	ESPA	12.5	LATV	19.1	MALT	35.3
ELLA	-38.2	ELLA	-37.3	FRAN	12.7	ROMA	22.5	PORT	38.5
POLS	-39.8	PORT	-45.3	KYPR	13.1	ESPA	23.2	SLKA	39.2
CESK	-42.7	MALT	-48.8	ELLA	13.3	PORT	28.3	LIET	47.2
SLKA	-46.4	SLKA	-50.8	SLJA	14.5	ITAL	30.7	ITAL	49.3
PORT	-56.8	LIET	-55.7	LATV	17.0	BELG	32.4	ROMA	53.5
MALT	-65.6	POLS	-62.4	BELG	18.5	CESK	46.8	POLS	59.0
ROMA	-87.4	ROMA	-102.5	ÖSTE	25.8	MAGY	49.6	KYPR	59.7
BALG	-95.6	BALG	-127.1	ITAL	35.5	BALG	68.1	BALG	60.0

Legend: a) Opportunities in the area to be physically active; b) clubs offer of opportunities to be physically active; c) I do not care to take advantage of opportunities to be physically active (*); d) I do not care to be physically active (*); e) local authorities are not doing enough for physical activity (*).

(*) Item on which a more positive attitude to participation has a negative sign.

they are present at the highest levels. On the other hand, there are countries where the disinterest is greater, compared to a reduced offer (Italy), as well as in the case of a good level offer.

5. Conclusions

We wanted to measure the levels of involvement of EU citizens in active life styles, analysing both the

sport activities and the physical ones. We did not analyse issued results, but used the individual record file, reprocessing data in different ways. We tried to reconstruct the COMPASS general model with the available information. The patterns of participation were studied in relation to socio-demographic variables.

The main result is the best solution for cluster analysis in six groups; it explains 84.6% of the inertia. The cluster were so labelled: citizens with occasional sport engagement; active citizens; citizens with intensive open air activities; fitness world; traditional sport world; non active people.

We found strong differences in the levels of participation among EU countries. The determinants are both motivational and socio-demographic, but are mainly linked to the different national and local policies.

From a methodological point of view, the need to identify one (or more) indicators of national levels of participation (preferably disagreeable even at regional ones) has strengthened, which allows us to monitor the time evolution of active life styles of the European population. We can stress the usefulness of the results obtained in terms of findings that can be utilized for sport policy strategies.

The first constraint in this strategy is that the conceptual model of reference should be unique: which we have inspired to be COMPASS, nevertheless some changes to its settings have been made. We choose this strategy after having compared it with other possible ways of investigating and analysing sport participating trends in different countries, discussing their costs and benefits.

Some key points are at the base of COMPASS: the definition of sport, already acquired; a scheme based on three components of participation in sport, to be measured in various ways; applicability to national surveys, for which some methodological requirements to be ensured have been suggested, with the hope that they are operated by national or supranational accredited statistical agencies.

In this context, another contribution of the paper was to show how, with few changes in the wording of questions and in the strategy of analysing the responses, also a supranational survey such as the one conducted by the Eurobarometer may be useful to measure participation trends. In the case of national surveys, however, it must be reported that there is a strong need to use the results of official surveys, with the above mentioned characteristics, produced by statistical agencies, and not estimates or subjective judgments of experts, or even via academics, or information produced by committees, federations or sporting organisations, which have a partial view of the phenomenon. The results are important as suggestions for planning future surveys in such a way that they ensure benchmarking in time and in space.

Regarding the components, the trend seems to overshadow the quality (the competitive aspect) and organisation (the membership), focusing on the quantity (the frequency of participation). This is to meet the new definition of HEPA (Health Enhancing Physical Activity) proposed by the World Health Organisation [23], which refers exclusively to the weekly opportunities to participate in activities and their duration. Physical activity should be undertaken every day for at least 30 minutes to give health benefits; if not daily, at least three times a week to be called regular.

The WHO proposal of physical activity, however, is generic and not even comparable to sport in its broader concept, that of the aforementioned definition of the Council of Europe. The second is a subcategory of the first, since sport must be structured and planned to maintain or improve fitness. Therefore, it is important to classify the participation in various activities in an articulated manner with respect to its objectives and not so indistinct, based only on the frequency and duration.

In fact, to solve this problem, it would be enough to change the frequency classes of the COMPASS scheme, keeping the differentiations proposed using

the other two components. Without the quality and the organisation, the measurement of physical activity, movement, would in fact blur, losing the ability to measure the articulated and complex souls of sports! This problem is enhanced if the measurement strategy of participation has as its objective the identification of indices/indicators to be used in view of sports policies, even although mainly oriented to sport for all, and not of health policies.

References

[1]   European Commission. 1999. European Model of Sport. Brussels: European Commission DG X.

[2]   European Council. 2000. Nice Declaration, Declaration on the specific characteristics of sport and its social function in Europe, Nice.

[3]   Commission of the European Communities, White Paper on Sport, Brussels, 2007.

[4]   European Union, Lisbon Treaty, Official Journal of the European Union, C306, vol. 50, 2007.

[5]   Pioletti, A. M., and Porro, N. 2013. Lo sport degli europei, F.Angeli, Milano. (in Italian)

[6]   Castejon Paz, B., de Dios Garcia Martinez, J., and Carbalada, R. 1973. "Rationalising Sports Policies. Outline of a Methodology." Strasbourg, Council of Europe.

[7]   Rodgers, B. 1977. Rationalising Sports Policies. Sport in Its Social Context: International Comparisons. Strasbourg: Council of Europe.

[8]   Rodgers, B. 1978. "Rationalising Sports Policies." Sport in its Social Context: International Comparisons (Technical Supplement)." Strasbourg, Council of Europe.

[9]   Claeys, U. 1982a. "Rationalising Sports Policies. Sport in European Society: A Transnational Survey into Participation and Motivation." Strasbourg, Council of Europe.

[10] Claeys, U. 1982b. "Rationalising Sports Policies. Sport in European Society: A Transnational Survey into Participation and Motivation (Technical Supplement)." Strasbourg, Council of Europe.

[11] UK Sport, COMPASS: Sport Participation in Europe. A Project Seeking the Co-ordinated Monitoring of Participation in Sport in Europe, London, 1999.

[12] Gratton, C., Rowe, N., and Veal, A. J. 2011. "International Comparisons of Sports Participation in European Countries. An Update of the COMPASS Project." *European Journal of Sport & Society* 8 (1-2): 99-116.

[13] Mussino, A. 2001. "Gestion coordinada de las dimensiones sociales, culturales y economicas del deporte." In Deporte y cambio social en el umbral del siglo XXI (1): 71-82, Esteban y Sanz, Madrid, (in Spanish)

[14] Mussino, A. 1999. "Conceptual and Operational Problems in Measuring Participation in Sports." Presented at the 52nd ISI Session LVIII (2): 345-6, ISI, Helsinki.

[15] Rossi, M. B. 1994. "Improving the Evaluation of Sports through Statistics." Presented at the 1st Meeting of ISI Sports Statistics Committee, CONI, Roma.

[16] Smith, I. 1996. "Challenges Ahead for Improving Sports Statistics." Presented at the 2nd Meeting of ISI Sports Statistics Committee, CONI, Roma.

[17] Scheerder, J. 2011 "Understanding the Game Sport Participation in Europe." SPM10, Katholieke Universiteit, Leuven.

[18] D'Arcangelo, E., Morrone, A., and Savioli, M. 2005. "Lo sport che cambia. I comportamenti emergenti e le nuove tendenze della pratica sportiva in Italia." Collana Argomenti vol. 29, Istat, Roma. (in Italian)

[19] Hoekman, R., Breedveld, K., and Scheerder, J. 2011. "Introduction to the Special Issue on Sports Participation in Europe." *European Journal of Sport & Society* 8 (1-2): 7-14.

[20] European Commission, "Sport and Physical Activity. Special Eurobarometer 72.3." European Commission DG Education and Culture, Brussels, 2010.

[21] Council of Europe, European Sport Charter (revised 2001), Strasbourg, 1992.

[22] Mussino, A. 2004. "L'armonizzazione delle statistiche sulla partecipazione sportiva: una sfida europea, Rivista Italiana di Economia." Demografia e Statistica LVIII (1-2): 149-76. (in Italian)

[23] World Health Organisation, HEPA Europe, WHO Regional Office for Europe, Copenhagen, 2007.

[24] Lebart, L., Morineau, A., and Tabard, N. 1977. "Techniques de la description statistique." Dunod, Paris. (in French)

[25] Mussino, A., 1995. Lezioni di Statistica sociale, Centro stampa "Sapienza", Roma. (in Italian)

[26] CISIA, SPAD.N Manuel de Référence, CISIA, Sèvres, 2005. (in French)