

## How Practicing Sport Affects Our levels of Well-Being?

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### Abstract

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Recently, economists have been increasingly interested in analyzing different variables that may affect subjective well-being (SWB), e.g., income, work, political and social environment, or habits. This paper attempts to ascertain if practicing sport and other hobbies explains higher levels of SWB. In order to control these variables, a homogenous sample of researchers and teachers from Italian Universities was used. Then, a comparison is established with another sample of Spanish students to see if there is any generational effect. Subjects of both samples answered a questionnaire on socio-demographic data, habits and SWB (measured by the "Life Satisfaction scale" and the "Psychological General Well-Being (PGWB) test"). A relation between practicing sport and SWB was found in the teacher sample. However, no relation between practicing hobbies and SWB was observed. Practicing sports is significant to explain SWB only in the teacher sample. These results must be considered to help design prevention policies in the public health field since practicing sport is an easy and cheap way to prevent or improve psychological diseases, and to generally improve citizens' quality of life.

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**Keywords:** Subjective well-being, Life satisfaction, public health policies, sport

**JEL:** I1, H8

### 1. Introduction

In developed countries, psychological diseases such as depressive and anxiety disorders have increased in recent decades, and also in young populations ([Campion, Bhui, & Bhugra, 2012](#)). These diseases involve considerable costs for public budgets and worsen the quality of life of those suffering them ([Olmeda, Martínez, De la Poza, Consuelo, & Tarazona, 2011](#)).

Subjective well-being (SWB) is often used by psychologists as an umbrella term for how we think and feel about our lives ([Dolan, Peasgood, & White, 2008](#)). The recent interest shown by economists in studying well-being and happiness has led to the development of other measures, such as the Satisfaction with Life Scale or the Subjective Happiness Scale ([Stubbe, de Moor, Boomsma, & de Geus, 2007](#)).

Many scholars have attempted to find empirical evidence for the relation between behavior and wellness or mood state, which has led to many measures of the subjective frame of mind being created; e.g., POMS (Profile of Mood States) ([Andrade-Fernández, Arce-Fernández, & Seoane-Pesqueira, 2002](#)), Big Fish, STAI (State-Trait Anxiety Inventory) and the PGWB Test (Psychological General Well-Being Test).

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However, tests like POMS or STAI do not adequately sample the full range of affective experiences because they characterize well-being only for absence of distress. For this reason, we chose the PGWB test and the "Life satisfaction" scale.

In line with this, several studies into SWB and happiness have identified a variety of factors that affect SWB. In general, scholars have focused on "happiness economics" and have identified a range of personal, economic and social factors associated with SWB. For example, [Frey \(2008\)](#) reported cluster factors that affect SWB in the followed items: income, economic situation, level of democracy, type of job, marriage and divorce, salary equity between men and women, and TV viewing.

Along these lines, [Dolan et al. \(2008\)](#) reviewed economics journals that consider SWB and its determinants, and they identified the following factors: income, personal characteristics (including gender, age, ethnicity), socially developed characteristics (including education, type of work, unemployment), how we spend our time (including exercise), attitudes and beliefs towards our and others' life, relationships and income inequality.

For this study, however, we focused on finding a relation between practicing sport and other leisure activities and higher levels of SWB. In order to control this variable, a homogeneous sample of teachers was selected in terms of economic and social factors. Nevertheless, another sample of students was collected to check whether there was any generational effect.

There is a substantial number of works in the literature indicating that physical activity and regular exercise can improve quality of life in both physical and psychological dimensions ([Laforge et al., 1999](#); [Schnohr et al., 2005](#)), and the effect of physical activity on SWB has recently received increasing attention ([Jiménez, Martínez, Miró, & Sánchez, 2008](#); [Stubbe et al., 2007](#)). In addition, physical activity might prove to be an effective measure to treat, and to even prevent, psychiatric diseases such as depressive and anxiety disorders ([Stubbe et al., 2007](#)). Furthermore, physical activity has increasingly been recommended to individuals with or without such diseases to help improve their quality of life and their well-being ([Fox, 1999](#); [López et al., 1995](#); [Peluso & Guerra de Andrade, 2005](#)). The results of these studies can prove useful to reinforce prevention policies in the public health field. In fact, many medical organizations recommend physical activity to the general population because it is considered an important tool to help improve public health.

In addition, and according to the literature, engagement in leisure activities also has a beneficial effect on peoples' SWB because they provide opportunities to meet life values and needs, they build social relationships, and they allow us to feel positive emotions and to acquire additional skills and knowledge ([Brajša-Žganec, Merkaš, & Šverko, 2011](#)). In general, achieving good SWB levels to achieve some engagement with the community is a fundamental factor ([Campiglio, 2012](#)).

Therefore, the purpose of the present study is to verify if practicing sports and other leisure activities constitutes explicative variables of SWB.

### **1.1. Theoretical background.**

Economists have recently begun to pay attention to subjective measures of well-being and have attempted to identify the factors influencing SWB. Some findings indicate that being unemployed has a huge negative effect on SWB, and other factors, like level of education, income, and the economic, social and political environmental context, also affect SWB ([Dolan et al., 2008](#)).

The effect of sport on SWB has been analyzed by some scholars who focused on some specific groups of society, such as the elderly ([Campos et al., 2003](#); [De Gracia & Marcó, 2000](#); [Elavsky & McAuley, 2005](#); [Ku, McKenna, & Fox, 2007](#); [McAuley, 2001](#)), sportspeople ([López et al., 1995](#)), college-aged individuals ([Raglin, Morgan, & O'Connor, 1991](#)), people with some handicap or disease ([Knobf, Musanti, & Dorward, 2007](#); [Manns & Chad, 1999](#); [Ravenek, Ravenek, Hitzig, & Wolfe, 2012](#)), and people with mental diseases such as anxiety and depression ([De Moor, Beem, Stubbe, Boomsma, & De Geus, 2006](#); [Taylor, Sallis, & Needle, 1985](#)).

Evidence shows that for these specific population groups, exercise has a positive effect on mood, self-confidence, positive feelings and SWB. However, this study analyses if practicing sport also has a positive effect on the SWB of a general population with no specific diseases or physic characteristics. In order to control the “practicing sport” variable, our sample of teachers is composed of people who share common work, and a social and economic environment. The student sample maybe is not so homogeneous in terms of income, but allows to compare with the teacher sample in order to capture if there is any difference about practicing sports to explain SWB, either if we consider a person in their student time (mainly young people) or a person in their working life (mainly middle-aged people).

**2. Method**

For this study, a homogeneous sample was selected to avoid biases for levels of income, level of education, type of job and the economic, social and political environmental context. The selected sample comprised teachers and researchers working in universities from central-north Italy. Then, a comparison is established with another sample of Spanish students, to analyze if there is any generational effect.

Data were collected during the February-July 2012 period using a questionnaire that was sent by email to the 12 faculties which decided to collaborate. The sample comprised 121 teachers and researchers from Italian University Faculties (the faculties belonging to the Universities of Modena, Bologna, Firenze and Torino), who completed a questionnaire which contained questions about descriptive situations, habits and SWB. Then, a similar questionnaire was presented to a second sample (collected in October 2013-February 2014) formed by 64 first-year degree students. Although this sample is not so homogeneous in terms of income levels, it is interesting to compare if there is any generational effect, in terms of time devoted to sports and habits or in life satisfaction.

**2.1 Questionnaire**

The questionnaire was accurately designed ([Gudicini, 2011](#)) to collect the data required for the study. The items contained in the questionnaire are summarized in Table 1. We chose cross-sectional data to achieve the goals set out. According to [Krueger & Schkade \(2008\)](#), comparing months or weeks does not add much information because dramatic events are absent and overall life satisfaction does not change much from week to week. However, using panel data could prove interesting for future studies to compare periods of years.

**Table 1. Items contained in the questionnaire.**

Personal characteristics	Age Gender Marital status Healthy diet	Children Smoking TV viewing
Sports and hobbies	Practicing sport Sport hours a week Type of sport Satisfaction with the sport practiced	Practicing a hobby Hobby hours a week Type of hobby Satisfaction with the hobby practiced
SWB	Job satisfaction Life satisfaction	The PGWB test

SWB was measured in two different ways:

**1. Life Satisfaction Scale:** The Life Satisfaction Scale is a single item that measures the cognitive aspects of SWB with the question: When all is taken into account, how satisfied are you with your life? We called this variable “Life satisfaction” (LS) and answers are given in a Likert scale from 1 to 10.

**2. Psychological General Well-Being (PGWB) test:** This index allows to measure subjective feelings of well-being or distress through 22 items. The variable, called “Level of well-being” (LW), derives from the PGWB test score, and it is computed as the sum of the answers to 10 questions, which can be answered with a Likert scale from 1 to 5. Therefore, LW variable ranges between 10 and 50.

## 2.2 Statistical analysis

In order to analyze the effect of practicing sports or hobbies on SWB (LS and LW) a  $\chi^2$  test was applied. In addition, a one-way ANOVA was used to compare mean levels of SWB (LS and LW) between subjects whom practice or not sports. The same analysis was applied to hobby practice. Pearson correlations were applied to identify significant individual associations between SWB (LS and LW) and the set of continuous variables included in the questionnaire. For discrete variables, tau-kendall coefficients were calculated. Variables that were significant individually associated to SWB (LS and LW) were included in the model for multiple regression analysis that was performed by the forward step-wise method. Statistical analysis was performed using SPSS, version 21 (IBM Corporation, Armonk, NY, USA). Results were considered to be statistically significant when  $p < 0.05$ .

## 3. Results

One-hundred and twenty-one subjects agreed to participate in the study, fulfilled the questionnaire and returned it by email to the research team. Mean age was  $47 \pm 15$  years, 52.9% were men and 87.6% were non-smokers. There were no differences in mean age, gender distribution or smoking incidence between subjects practicing sports or hobbies or not practicing (Table 2). Regarding the student sample, 64 students agreed to participate. Mean age was  $22 \pm 7$  years, 56.3% were men and 81.3% were non-smokers.

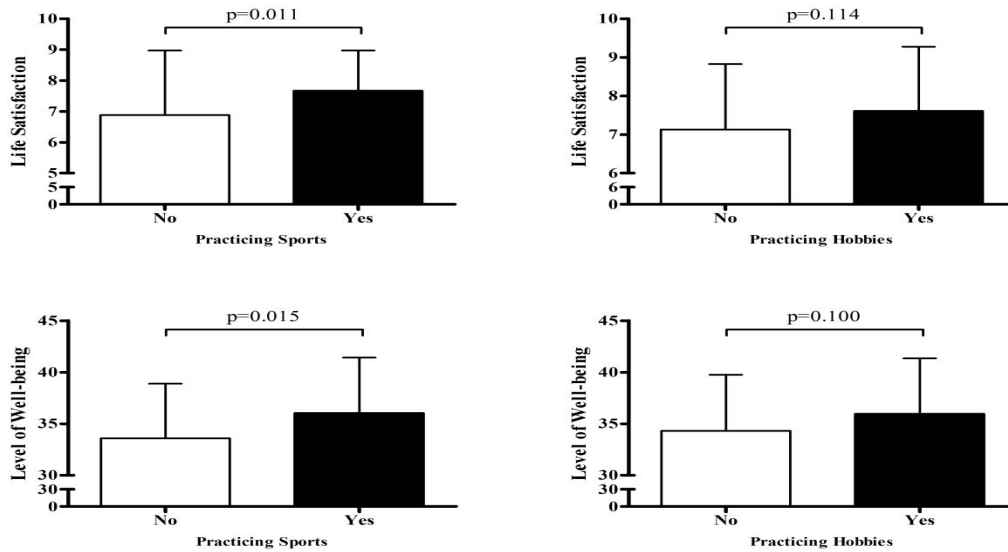
**Table 2. Mean age, sex distribution and tobacco occurrence in subjects involved in practicing or not sports or hobbies**

		Non-practicing sports	Practicing sports	Non-practicing hobbies	Practicing hobbies
Teacher sample	Sample	n=48	n=73	n=64	n=57
	Age (years)*	46.8±14.6	43.3±15.5	44.6±14.2	44.8±16.3
	Sex (f/m)	27 / 21	30 / 43	30 / 34	27 / 30
	Tobacco (% smokers)	12.5%	12.3%	15.6%	8.8%
Student sample	Sample	n=13	n=50	n=20	n=43
	Age (years)*	20.07±4.71	22.49±7.72	23.85±8.83	21.07±6.22
	Sex (f/m)	10 / 3	17 / 33	9 / 11	18 / 25
	Tobacco (% smokers)	35.7%	14%	15%	20.5%

\* Data as mean±standard deviation.

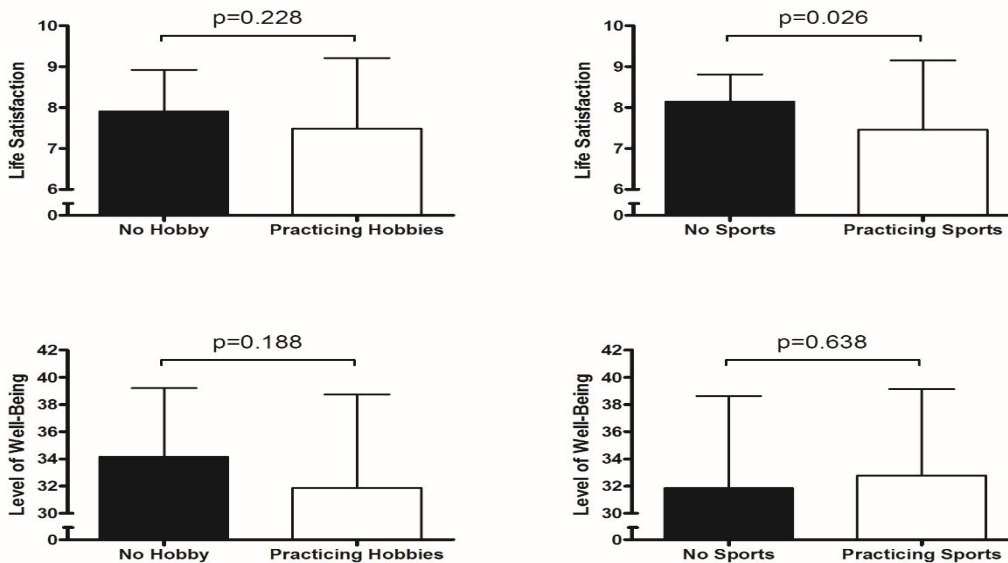
SWB by means of LS or LW was evaluated in all subjects (LS:  $7.5 \pm 1.4$ ; LW:  $35.0 \pm 5.5$ ). In both cases, answers show quite high average levels of SWB. Correlation between both variables describing SWB was found to be high ( $r=0.676$ ,  $p < 0.001$ ). Subjects practicing sports showed elevated SWB when compared to those that not (Figure 1), while practicing hobbies was not found to elevate LS ( $F(1,120)=2.535$ ;  $p=0.114$ ) or LW ( $F(1,120)=2.746$ ;  $p=0.100$ ).

**Figure 1.** Subjective Well-being measured as means of Life Satisfaction and Level of Well-being in function of practicing or not sports or hobbies (Teacher sample).



Regarding the student sample, SWB yields average values of LS  $7.61 \pm 1.55$  and LW  $32.58 \pm 6.41$ . They do not differ too much from the teacher sample. Correlation between both variables describing SWB was found to be more moderate than in the teacher sample ( $r=0.584$ ,  $p<0.001$ ). Subjects non-practicing sports showed elevated SWB (with LS) ( $F_{\text{Brown-Forsythe}}(1,55.08)=5.256$ ;  $p=0.026$ ) and there is no difference between groups if we look at LW ( $F(1,62)=0.224$ ;  $p=0.638$ ). Regarding hobbies, subjects non-practicing hobbies showed elevated SWB with LS ( $F_{\text{Brown-Forsythe}}(1,57.64)=1.486$ ;  $p=0.228$ ) while there is no difference between groups if we look at LW ( $F(1,62)=1.771$ ;  $p=0.188$ ).

**Figure 2.** Subjective Well-being measured as means of Life Satisfaction and Level of Well-being in function of practicing or not sports or hobbies (Student sample).



Correlation analysis showed that LS was significantly associated to job satisfaction ( $r=0.590$ ,  $p<0.001$ ) and practicing sports ( $r=0.230$ ;  $p=0.011$ ). LW was correlated to smoking ( $r=-0.200$ ;  $p=0.028$ ), job satisfaction ( $r=0.495$ ,  $p>0.001$ ), age ( $r=0.193$ ,  $p=0.034$ ), gender ( $r=-0.222$ ,  $p=0.015$ ) and practicing sports ( $r=0.221$ ,  $p=0.015$ ).

For the student sample, correlation analysis showed that LS was significantly associated to having a partner ( $r=0.268$ ,  $p=0.019$ ), have asked a scholarship ( $r=-0.227$ ,  $p=0.048$ ), average mark ( $r=0.257$ ,  $p=0.04$ ), studies satisfaction ( $r=0.489$ ,  $p<0.001$ ). Regarding LW, it was correlated to gender ( $r=-0.221$ ,  $p=0.039$ ) and studies satisfaction ( $r=0.476$ ,  $p<0.001$ ).

Finally, forward step-wise multiple linear regression analysis was performed to find which variables were significantly explicative of LS and LW. The initial model includes the following variables: age, gender, smoking, job satisfaction, practicing sports and practicing hobbies. The best model explained about 37% of LS variance and included job satisfaction and practicing sports as independent variables (Table 3). LW was better explained (31%) by job satisfaction, smoking and practicing sports.

Even if LS and LW models explained only 37% and 31% of data behavior, we consider it sufficient given the complexity of the dependent variable.

**Table 3. Multiple linear regression models in the teacher sample**

	LS		LW	
	Non-standardized coefficient	$\beta$ coefficient	Non-standardized coefficient	$\beta$ coefficient
<b>Model 1 (<math>R^2=0.343</math>)</b>				
Constant	3.48		-5.847	
Job satisfaction	0.563	0.586***	1.492	0.489***
<b>Model 2 (<math>R^2=0.367</math>)</b>				
Constant	3.14		-6.279	
Job satisfaction	0.538	0.559***	1.389	0.455***
Practicing Sports	0.461	0.156*	1.855	0.198*
<b>Model 3 (<math>R^2=0.309</math>)</b>				
Constant			-5.58	
Job satisfaction			1.33	0.436***
Practicing Sports			1.913	0.204*
Smoking			-0.234	-0.180*

\* $p<0.05$ , \*\*\*  $p<0.001$

Similarly, in the student sample, a step-wise multiple linear regression was conducted, to find which variables were significantly explicative of LS and LW, and if they differ from the ones in the teacher sample. The initial model includes the same variables as in the teacher sample but also the ones with a significative association in the correlation analysis with LS and LW. All of them are the following variables: age, gender, smoking, studies satisfaction, practicing sports and practicing hobbies, having a partner, have asked a scholarship and average mark.

**Table 4. Multiple linear regression models in the student sample**

	LS		LW		
	Non-standardized coefficient	$\beta$ coefficient	Non-standardized coefficient	$\beta$ coefficient	
Model 1 (R <sup>2</sup> =0.245)			Model 1 (R <sup>2</sup> =0.224)		
Constant	4.287		Constant	19.485	
Studies satisfaction	0.476	0.495***	Studies satisfaction	1.843	0.473***
Model 2 (R <sup>2</sup> =0.324)			Model 2 (R <sup>2</sup> =0.336)		
Constant	4.129		Constant	19.805	
Studies satisfaction	0.435	0.453***	Studies satisfaction	2.067	0.530***
Having a partner	0.886	0.284*	Gender (woman=1)	-4.331	-0.34*
Model 3 (R <sup>2</sup> =0.378)			Model 3 (R <sup>2</sup> =0.385)		
Constant	4.709		Constant	19.312	
Studies satisfaction	0.402	0.418***	Studies satisfaction	1.947	0.499***
Having a partner	0.879	0.282*	Gender (woman=1)	-4.546	-0.357*
Asking scholarship	-0.733	-0.234*	Having a partner	2.853	0.226*

\* $p < 0.05$ , \*\*\*  $p < 0.001$

In the case of LS, asking for a scholarship is capturing the lower income of the family. In the case of LW, a significant variable to explain SWB is gender, specifically being a woman implies lower self-reported SWB. [Stubbe et al \(2007\)](#) also found that men were more satisfied with their lives than women.

#### 4. Discussion

The present study analyses the relation between practicing sports and other leisure activities with SWB in a sample of teachers and researchers from Italian Universities. According to the results obtained, there is a relation only between practicing sports and SWB since there are differences in LS and LW between exercisers. However, several published works report a positive relation between SWB and leisure activities, considered only for people who are strongly engaged with leisure activities ([Brajša-Žganec et al., 2011](#)). The variable with the strongest effect on SWB is "Job satisfaction". In our LW model, "Practicing sport" also has a positive effect on SWB, while "smoking" has a weaker, negative effect on SWB.

Exercise participation is associated with higher levels of life satisfaction; in other words, exercisers are, on average, more satisfied with their lives and have higher levels of well-being than non-exercisers. Our regressions of LS and LW models in the teacher sample explain respectively 36.7% and 30.9% of data variability. We consider that this is an acceptable result because, in general, experienced analysts have found that R<sup>2</sup> was 0.80, or above, for models based on time-series data. Cross-section data models give values within the 0.40 to 0.60 range, and the models based on individual people's data often give R<sup>2</sup> values within the 0.10 to 0.20 range ([Newbold, Carlson, & Thorne, 2013](#)). [Krueger & Schkade \(2008\)](#), for example, report a similar R<sup>2</sup> in their study into the reliability of subjective well-being measures.

In the student sample, LS and LW regressions explain 37.8% and 38.5% respectively. Studies satisfaction is the variable with the highest effect on SWB, in both LS and LW regressions. Having a partner has also a positive effect while asking for scholarship a negative effect, but they are both weaker, in the case of LS. In our LW model, the variables with lower effects are gender and having a partner, in the former variable a negative effect associated with being a woman while in the latter variable a positive effect. It is worth mentioning that practicing sport is significant to explain SWB in the teacher sample but not in the student one. There is a lower percentage of subjects not practicing sports in the student sample (26%) than in the teacher sample (39.67%). Then, maybe this is a possible explanation that in the teacher sample, middle aged people in their working life, is important to practice sports and this is translated in a higher self-reported well-being. However, students, mainly young people, have more free time and engage in some activities, implying that practicing sports has not such a determinant effect in explaining SWB.

What are the policy implications which can be concluded from this study? We believe that Public Administrations must encourage engagement in exercise programs, sports competitions or in some routine types because the problem does not lie in persuading people to exercise, but in encouraging them to stick to it. People repeatedly make attempts to be active, but fail (Yeung, 1996). Also they can consider the possibility of subsidizing it, since it is maybe cheaper than treating several diseases related with a sedentary life. This study provides valuable findings for the relation between practicing sport and SWB. However, we must note some limitations. This study uses cross-sectional data, so any conclusions on the causality between practicing sport and SWB must be drawn with caution. In addition, there is another problem with causality since well-being or a personality profile leading to better well-being may be a prerequisite for people to engage in exercise in the first place. Emotionally well-adjusted individuals may be more attracted to exercise, and may have the necessary energy and self-discipline to maintain an exercise regime (Stubbe et al., 2007).

For our teacher sample, in which individuals share a common work, social and economic environment, these being the factors that most affect SWB according to the literature, we find that "Job satisfaction" is the variable that best explains SWB, followed by the "Practicing sport" variable. In the student sample, studies satisfaction is also the variable that best explains SWB, followed by "having a partner" variable. Therefore, because "Job/studies satisfaction" and "having a partner" are difficult factors to manage, Public Administrations must act based on the "Practicing sport" variable by promoting it to all age groups. Because maybe for young people with more free time, generally still not having a family, is more likely to be engaged in a sport activity, but for middle aged people in their working life it should be encouraged, since it has great effects in their SWB. In conclusion, we firmly believe that promoting sports in society can prove to be a tool that is not only cheap and available to improve the mood, well-being and quality of life of individuals, but one that is capable of preventing or reducing physiological diseases. Therefore, promoting sports is a good policy for both, individuals and also the authorities in the government.

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