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MOTIVATION AND MOTIVATIONAL CLIMATE AS PREDICTORS OF PERCEIVED IMPORTANCE OF PHYSICAL EDUCATION IN SPAIN

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ABSTRACT

The aim of this research was to find out how self-determined motivation and perceived motivational climate predict the importance and usefulness of Physical Education (PE). The sample consisted of 2002 Spanish students aged between 12 and 19 years. A questionnaire was used composed of the 'Sports Motivation Scale' (SMS), the 'Learning and Performance Orientations in Physical Education Classes Questionnaire' (LAPOPECQ) and the 'Importance of Physical Education' (IPE). Descriptive statistical analysis, MANOVA and multiple regression analysis were applied. The results of this study show the importance of intrinsic motivation for both boys and girls as a predictor of the importance and usefulness of PE for the participants, although girls were affected by a greater number of variables.

Key words: Physical Education; Importance; Self-determined motivation; Motivational climate.

INTRODUCTION

Certain habits are harmful to health; among them a poor diet and lack of exercise and these are responsible for almost as many deaths as those which tobacco produces (Mokdad *et al*., 2004). In the European Union, more than 13 million deaths per year are linked to a lack of physical exercise and excess weight (Banegas *et al*., 2003), and unfortunately this situation is getting worse. In Spain, overweight among adults reached 20% in 2010, one of the highest in Europe (Franco *et al*., 2010). This fact brings with it a severe economic burden for the Spanish state in addition to the associated health risks. The rise in overweight and obesity has been responsible for increases in health expenditures in several developed countries. In the USA obesity has been responsible for 27% of the increase in real health expenditure per capita between 1987 and 2001 (Thorpe *et al*., 2004), while hospitalisation costs in Brazil due to obesity amounted to $841 273 181 (Sichieri *et al*., 2007). These alarming trends give rise to the question as to what can be done in programmes like Physical Education (PE) to improve or prevent overweight.

According to Ardoy *et al.* (2010) and Oviedo *et al.* (2013), PE has ever-greater social significance in the fight against childhood obesity, due to its role in the acquisition of physically active habits. In support of this, various studies show that the age range of 12 to 18 years is when the greatest decrease in participation in physical activity occurs (Caspersen *et al*., 2000; Gómez-López *et al*., 2010), mainly due to the lack of motivation and free time.

In the study of motivational processes related to the acquisition of healthy habits in students, the social-cognitive theory has led to great advances. Specifically, the achievement goal theory (Nicholls, 1984), and the theory of self-determination (Deci & Ryan, 1985), allow for the obtaining of very valuable information for teachers, helping them to increase the positive experiences of the learners in PE lessons (Moreno & Llamas, 2007). This would promote a greater participation in and motivation for sport activities.

The achievement goal theory (Nicholls, 1989) aims to analyse the different dispositional and environmental factors influencing the subject's achievement motivation and it distinguishes between personal factors (dispositional orientation), and social and situational factors (motivational climate). According to Nicholls (1984/1989), motivational climate is continuously created by parents, teachers, friends, and can be of two types: a task motivational climate; and an ego motivational climate. Thus, a student who perceives a climate task will aim to master the task that is proposed to him or her in class and achieving it will increase his or her sense of competence. By contrast, a student who perceives an ego climate (competitive climate) aims to show his or her competence in relation to others and relates failure to lack of ability (Moreno *et al*., 2013).

As established in recent work (Moreno-Murcia *et al*., 2009b; Granero-Gallegos *et al*., 2012), the self-determination theory proposed by Deci and Ryan (1985, 2000), assumes the existence of different types of motivation, which can be found in the learner: intrinsic motivation; extrinsic motivation; and amotivation. With regard to intrinsic motivation, distinctions can be made between intrinsic motivation for knowledge (interest in progress in the understanding of activity), for achievement (interest in progress in the acquisition of skills) and for stimulation (interest in the activity arising from the sensations experienced in its practice). There are also three different types of extrinsic motivation, namely identified (which refers to interest in participating in the sport to achieve goals considered relevant by the subjects for their personal development), introjected (participating in sport to avoid guilt feelings) and external regulation (interest in participating in the sport for prizes or rewards) extrinsic motivation.

Some research studies in PE (Goudas, 1998; Moreno *et al*., 2006), have studied both theories together, trying to discover the relationship between the motivational climate perceived by students and motivation. Authors such as Standage *et al*. (2003) have demonstrated that there is a positive relationship between the motivational climate surrounding the task and intrinsic motivation. With regard to motivation, Moreno and Llamas (2007) showed that motivation generated by the teacher was a determining factor in the perception of the usefulness and importance of PE by students. Others like Moreno *et al.* (2007) and Moreno *et al.* (2009d), found that students who practised more extracurricular physical activity, perceived PE to be of high importance and useful. Taking into account the urgency of the necessity to reduce obesity among school students and the need for physical activity for school children, it is

critical to know what can improve the importance and usefulness of PE as experienced by students, with a view to increasing school practice of physical activity.

Therefore, the **objective of this research** is to find out to what extent self-determined motivation and perceived motivational climate predict the importance and usefulness of PE as experienced by students.

METHOD

Participants

In this study a total of 2002 (970 boys=48.5%; 1032 girls=51.5%) students participated from 17 secondary schools in the provinces of Almeria, Cordoba, Granada, Jaen and Seville. The age range was 12 to 19 years (Mean=14.99) (SD=1.43), with the median age for boys being 15.06 (SD=1.43) and that of girls 14.93 (SD=1.43) years.

Instruments

Sport Motivation Scale (SMS)

The Spanish validated version was used by Núñez *et al*. (2006), and adapted for PE by the same authors. The original scale was called Echelle Motivation dans les Sports (EMS) (Brière *et al*., 1995), and was translated into English by Pelletier *et al*. (1995), who renamed it the *Sport Motivation Scale* (SMS). Psychometric performance similar to the French version was obtained. It consists of 28 items, which include the different types of motivation, as established by the theory of self-determination (Deci & Ryan, 1985). The theory of self-determination explains the multidimensionality of motivation: amotivation; extrinsic motivation (EM) (external regulation, introjected, identified); and intrinsic motivation (IM) (knowledge, achievement, stimulation). A total of 4 items correspond to each of the 7 motivational factors.

Students were asked to answer on a scale of politomic items with scores ranging from 1 (strongly disagree) to 7 (fully agree). Previous studies (Moreno *et al*., 2006; Moreno & Llamas, 2007), have proven the internal validity of the factor structure of the instrument, as well as its reliability in the field of PE. Internal consistency found in this study was: IM knowledge, α=0.84; IM achievement, α=0.82; IM stimulation, α=0.82; identified EM, α=0.80; imposed EM, α=0.69; external regulation EM, α=0.77; and amotivation, α=0.72. The consistency among boys' values was between 0.68 (introjected EM) and 0.84 (IM knowledge), while among girls the values ranged from 0.69 (amotivation) to 0.83 (IM knowledge, IM achievement and IM stimulation). Although internal consistency values of less than 0.70 (0.69–0.70) were obtained for some factors, they can be considered marginally acceptable given the small number of items on the subscale (Taylor *et al*., 2008).

Learning and Performance Orientations in Physical Education Classes Questionnaire (LAPOPECQ)

The Spanish version (Cervelló *et al*., 2002) of the original Learning and Performance Orientations in Physical Education Classes Questionnaire was used (Papaioannou, 1994).

This scale measures the student's perception of the motivational climate in PE classes. It is composed of 27 items and has 2 dimensions: Perception of motivational climate, which involves learning (learning climate; 13 items); and Perception of motivational climate, which involves the performance (performance climate; 14 items). Students had to answer on a scale of politomic items with a range of scores between 0 (strongly disagree) and 10 (totally agree). Recent studies (Moreno *et al*., 2009d; Moreno *et al*., 2009e), related to adolescents in educational contexts, have shown the internal reliability and validity of the factor structure in 2 first order subscales, obtaining internal consistency values greater than α=0.75 for the dimension of motivational climate for performance, and α=0.84 for the motivational climate for learning. In the present study, the internal consistency of the subscale climate for learning was α=0.90 (α_{Boys}=0.90; α_{Girls}=0.90) and performance climate, α=0.88 (α_{Boys}=0.88; α_{Girls}=0.87).

Importance of PE (IPE)

This test measured the importance and usefulness of PE as perceived by students (Moreno *et al*., 2009c), by means of 3 items. Students had to answer on a scale of politomic items with a range of scores between 1 (strongly disagree) to 4 (fully agree). Previous studies show its internal validity and reliability in the field of PE: α=0.75 (Moreno *et al*., 2009c), α=0.76 (Moreno & Llamas, 2007; Granero-Gallegos *et al*., 2012). In the current study the reliability obtained was 0.76 (α_{Boys}=0.76; α_{Girls}=0.77).

Procedure

The management of the schools granted permission to perform the research and students were informed of the purpose of the study and their rights as participants. The tests were administered during PE lessons after agreement with the teacher. Each participant had 20 to 30 minutes to complete the questionnaires. The responses were kept anonymous.

Statistical analysis

Descriptive statistics were calculated for each of the items, mean (M) and standard deviation (SD) values. The reliability of each dimension internal consistency index was calculated through (α) Cronbach's alpha. A multivariate analysis of variance (MANOVA) was performed to analyse the effect of interaction of gender in the studied subscales. Then a stepwise multiple regression analysis was conducted to verify the extent to which the various subscales of the SMS and LAPOPECQ (predictor variables), predict the importance and usefulness of PE (variable criteria), as perceived by the participants, differentiating between boys and girls (variable selection). The SPSS (*Statistical Package for Social Science*) v.17.0 was used for all calculations (Gil, 2003).

RESULTS

Effects of interaction of gender on the motivation, perceived motivational climate and the importance of PE as perceived by the participants

To analyse the effects of interaction of gender on the constructs studied, multivariate analysis of variance was carried out (MANOVA), in which the independent variable was gender and

the dependent variables were the subscales of self-determined motivation, motivational climate and the importance and utility of PE as perceived by the participants. The homogeneity of covariance was examined with Box's M test and the null hypothesis of setting data was rejected (Box M=184.03, F=3.33, p<0.000). The suggestions of Tabachnick and Fidell (2006) were followed regarding the use of Pillai's Trace instead of the Wilks' Lambda to evaluate the multivariate significance of main effects and their interactions. The multivariate contrast showed significant differences and effects of interaction of the independent variable (gender) (Pillai's Trace=0.11, $F_{(10,1998)}$=20.84, p<0.000), with the remaining variables. The tests on the inter-subject effects showed significant differences in 8 dimensions (Table 1).

***TABLE 1*: MULTIVARIATE ANALYSIS: INTERSUBJECT EFFECTS ACCORDING TO GENDER FOR SMS, LAPOPECQ AND IEF SUBSCALES**

Subscales	**Boys** (N=970)			**Girls** (N=1032)			**Significance***	
	α	**Mean**	**SD**	**α**	**Mean**	**SD**	**F**	**p**
SMS								
IM knowledge	0.84	5.09	1.29	0.83	4.62	1.35	37.86	0.000
IM achievement	0.79	5.31	1.18	0.83	4.88	1.33	38.95	0.000
IM stimulation	0.79	5.13	1.22	0.83	4.64	1.36	47.14	0.000
EM identified	0.82	4.97	1.32	0.78	4.46	1.34	51.52	0.000
EM introjected	0.68	5.08	1.21	0.70	4.82	1.27	11.77	0.001
EM external regulation	0.75	4.59	1.33	0.77	3.92	1.39	80.18	0.000
Amotivation	0.74	3.21	1.53	0.69	3.09	1.35	1.77	0.183
LAPOPECQ								
Performance climate	0.88	58.52	16.52	0.87	50.84	16.64	67.00	0.000
Learning climate	0.90	69.29	17.46	0.90	68.46	18.44	0.09	0.770
IEF								
Importance PE	0.76	3.17	0.72	0.77	2.95	0.71	36.07	0.000

*p<0.05

Significant differences were found in all the SMS dimensions: IM knowledge (p<0.000); IM achievement (p<0.000); IM stimulation (p<0.000); identified EM (p<0.000); introjected EM (p=0.001); and EM by external regulation (p<0.000), boys scored higher than girls. In the LAPOPECQ, boys showed higher values than girls in performance climate (p<0.000). No statistically significant differences in relation to the learning climate were found. On the importance and usefulness of PE, as perceived by participants, the BOYS also had higher values than the girls (p<0.000).

Stepwise multiple regression analysis

A stepwise multiple regression analysis was performed to verify to what extent the various subscales of the SMS and the LAPOPECQ predict the importance and utility of PE as perceived by the high school students. To do so, the rating of the IPE was taken as variable criteria and each of the dimensions of the SMS and the LAPOPECQ as predictor variables.

Gender was used as selection variable, to check prediction among boys and among girls. The index of tolerance and independence of the variables included in the regression equation were evaluated in addition to normal data rates. The index of tolerance produced values between 0.98 and 0.32 and variance inflation factor (VIF), produced values of 1.48 to 1.93, which indicates that the probability of error for possible colinearity is excluded (Hair *et al.*, 1999; Gil, 2003). In addition, the Durbin-Watson obtained was between 1.73 (girls) and 1.79 (boys), so the independence of the data obtained can be confirmed (Gil, 2003).

***TABLE 2.1*: IMPORTANCE OF PE FOR BOYS: MULTIPLE LINEAR REGRESSION BY STEPS ACCORDING TO GENDER BETWEEN LAPOPECQ AND SMS SUBSCALES**

Variables	F	ß	R^2	t	p*
Step 1					
IM knowledge	179.35	0.43	0.18	13.39	0.000
Step 2					
IM knowledge	95.28	0.31	0.23	6.08	0.000
EM identified		0.16		3.06	0.002

*p<0.05

ß= Standardised beta weights R^2= Total variance explained

***TABLE 2.2*: IMPORTANCE OF PE FOR FEBOYS: MULTIPLE LINEAR REGRESSION BY STEPS ACCORDING TO GENDER BETWEEN LAPOPECQ AND SMS SUBSCALES**

Variables	F	ß	R^2	t	p*
Step 1					
IM knowledge	220.22	0.45	0.19	14.84	0.000
Step 2					
IM knowledge	120.36	0.32	0.21	7.44	0.000
EM identified		0.18		4.07	0.000
Step 3					
IM knowledge		0.29		6.65	0.000
EM identified	84.47	0.19	0.24	4.46	0.001
Amotivation		-0.10		-3.19	0.001
Step 4					
IM knowledge		0.28		6.37	0.000
EM identified		0.17		3.96	0.000
Amotivation	66.02	-0.13	0.27	-3.93	0.000
Performance climate		0.10		2.90	0.004

*p<0.05

ß= Standardised beta weights R^2= Total variance explained

The results of the analysis of stepwise linear regression, differentiating the prediction according to the gender variable, can be seen in Table 2.1 and 2.2. In general, the results show the importance of intrinsic motivation as a predicting variable for students who ascribe greater importance and usefulness to PE, although girls were influenced by a greater number of variables.

In a more detailed analysis focused on boys, it can be highlighted that a total percentage of explained variance of 19% was obtained. In the first step, IM knowledge (*ß*=0.43) predicts positive consideration of PE as an important and useful subject, with a percentage of explained variance of 18%. In the second step, 23% of the total variance explained was reached, with identified EM also being introduced (*ß*=0.16). As can be seen, the greater the knowledge IM the student has, the greater the probability that he or she will assign more importance and usefulness to PE.

Twenty-seven per cent (27%) of the total variance explained was obtained for the girls, and in the case of the boys, the variable that best predicts the importance awarded to PE is knowledge IM (*ß*=0.45), reaching 19% of the total explained variance. In the second step, in addition to the strong predictive relationship of knowledge IM, identified EM is added (*ß*=0.18), attaining 21% of the explained variance. In the third step, amotivation is included (*ß*=-0.10) as the predicting variable, in a negative and significant way, reaching 24% of the explained variance. In this case, amotivation among the girls predicts a lesser degree of importance and usefulness assigned to PE. In the fourth step, 27% of the explained variance was achieved and a dimension of the LAPOPECQ was added where the perception of a performance climate (*ß*=0.10), was the predicting variable of the importance attached to the subject. Thus, when female students perceive a performance climate in PE lessons, there is a greater likelihood of them considering PE to be a more important and useful subject.

DISCUSSION

The objective of this research was to study the predictive power of motivation and motivational climate with regard to the importance and usefulness awarded to PE. The importance of this work lies in the fact that these results provide valuable information with regard to the variables that are most likely to predict a greater importance and usefulness being ascribed to PE, which could lead to an increase in the participation in after-school physical activity and greater adherence to the practice of sport, especially among girls.

Table 1 shows how intrinsic motivation in its different typologies achieved higher values than extrinsic motivation, with amotivation getting the lowest values. These results corroborate those obtained by Granero-Gallegos *et al.* (2013), and Gómez-López *et al*. (2013), who argue that among high school students, intrinsic motivation scores higher than extrinsic motivation, while amotivation is always the lowest.

In the LAPOPECQ, boys had significantly higher values than girls in performance climate, while there were no statistically significant differences in relation to the learning climate. In this last subscale, higher scores for performance climate were obtained, supporting the results reported by Martínez-Galindo *et al*. (2009) and Moreno *et al.* (2006; 2009a; 2013). In relation to the importance and usefulness of PE, the boys showed higher values than the girls, corresponding with the findings of Moreno *et al*. (2006).

In summary, with regard to the prediction of the importance ascribed to PE, both boys and girls intrinsic motivation is the most important factor followed by extrinsic motivation. This is in agreement with the findings reported by Moreno *et al.* (2006). In relation to the former type of motivation, data from this research corroborates the contributions of Moreno *et al*.

(2006), Baena-Extremera *et al*. (2012), Granero-Gallegos *et al.* (2012) and Gómez-López *et al*. (2013), who argue that the more self-determined motivational profile matches those students who ascribe greater importance to PE. Moreno *et al*. (2013), in a study of prediction along the lines of this present investigation, conclude that a high index of self-determination positively predicts the significance and usefulness ascribed by the student to PE. In this regard, several investigations show that self-determined motivation positively relates to greater commitment and adherence to the practice of sport (Standage *et al*., 2003; Moreno *et al*., 2007), to the point of becoming a predictive value (Duda & Ntoumanis, 2003; Moreno & Llamas, 2007). More specifically, this refers to intrinsic motivation (Koka & Hein, 2003; Moreno *et al*., 2006), which establishes a direct relationship with the practice of extracurricular physical/sport activities.

Concerning intrinsic motivation, knowledge IM had the greatest predictive value; therefore, it is clear that students doing PE sought to progress in their understanding of it. Wang and Biddle (2001) and Ntoumanis (2002), showed that more self-determined students show positive motivational impact factors towards the subject of PE, such as interest, effort, fun, satisfaction and high participation, which are essentials in the intrinsic motivation for knowledge.

The results have shown how students of both genders have a high intrinsic and extrinsic motivation in Step 2. With regard to this, Vallerand and Fortier (1998), amongst others, set out two theoretical positions. The first explains the alternation in the two types of motivation, namely when intrinsic is high, extrinsic is low. The second refers to the combination of intrinsic and extrinsic motivation, increasing motivation at the highest levels, with this being the case that has direct relevance to the present study. Similarly, Pelletier *et al*. (1995) and Vallerand and Fortier (1998), proposed this theoretical positioning at the contextual level (PE and sport), maintaining that the relationship between intrinsic motivation and non-self-determined forms of extrinsic motivation is orthogonal or slightly negative. Similarly, Vlachopoulos *et al*. (2000) used a cluster analysis in which one of the profiles is characterised by high scores in both types of motivation (intrinsic and extrinsic). Here, it was interesting to note that this group had the highest values in the practice of extracurricular physical activity, ascribing great importance to PE.

The third predictive element is amotivation. This was only present among the girls and in a negatively predictive relationship. According to Moreno *et al*. (2006), girls are usually located in an amotivation profile, ascribing less importance to PE. In the work of Baena-Extremera *et al*. (2012), the authors showed that girls had higher scores than boys in boredom, contrary to what was found in the study of Castillo *et al*. (2001). In the work by Vlachopoulos *et al*. (2000) and Standage *et al*. (2003), it was shown that amotivation relates negatively with the intention of girls to participate in physical activity in their leisure time. This suggests that while self-determined motivation predicts a positive intention to be physically active in leisure time related to the importance ascribed to PE, amotivation predicts intentions not to be physically active, corroborating the finding of other investigations (Duda & Ntoumanis, 2003). In this regard, Ennis (1996) states that girls tend to have more negative experiences regarding PE and less interest in participating in this area and doing physical activities in their leisure time than boys, which could explain the appearance of amotivation in the third step, which did not occur in the case of the boys.

The motivation performance climate appears in the fourth step of the regression analysis. It may be noted that the orientation to the task does not appear, but the performance does and, in addition, immediately after amotivation. According to Moreno *et al.* (2006), both the task and ego climate are related to the importance awarded to PE, the first generally being higher. Regarding this, studies such as those by Baena-Extremera *et al*. (2012) and Fernandez-Río *et al*. (2012), found that students who are oriented to the task tend to have fun and be satisfied with their PE classes, while for those who are oriented to the ego, it is the opposite; they get bored and they are amotivated (Nicholls, 1989; Duda *et al*., 1992), as was the case in the present study. Worst of all, and corroborating the findings of investigations by Cury *et al*. (1997) and Ginn *et al*. (2000), the orientation to the task tends to be related to a greater persistence, adherence and voluntary participation in physical activity, due mainly to the intrinsic motivation of students (Ntounamis, 2005), while the ego orientation is often related to non-persistence, abandonment and the imposed participation in this type of activity.

CONCLUSION

In conclusion, PE students in high school have a higher intrinsic than extrinsic motivation, and there is a still greater motivation among boys than among girls. Furthermore, among students the perception of motivational climate for learning is greater than for performance, although the boys perceive a greater performance climate. Boys also ascribe greater importance and utility to PE. The results of this study show the importance of intrinsic motivation for both boys and girls as a predicting variable for greater importance and usefulness being ascribed to PE, while a greater number of variables have an effect among girls. Thus, if the level of interest and physical/sport practice among girls is to be improved, attention must be given to variables in PE, which can enhance the importance and usefulness awarded to this subject among girls. Therefore, this research information will serve to assist in the design of PE programmes that seek a better understanding of the motivation to be physically active (Coakley & White, 1992), because experiences in PE lessons become mediators in the inclusion of physical activity as a healthy lifestyle habit (Moreno *et al*., 2006).

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