



SELF-DETERMINED MOTIVATION AND PHYSICAL EDUCATION IMPORTANCE

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ABSTRACT

It is widely accepted that when psychological needs for autonomy, competence and relatedness are encouraged in physical education classes, they can play a potentially important role in enhancing motivation and positive consequences. **Purpose.** The purpose of this study was to analyse the relations between self-determination theory and the importance and usefulness pupils give to physical education. **Basic procedures.** The sample consisted of 440 Spanish students, aged between 14 and 16, who were measured for psychological mediators (autonomy, competence and relatedness), motivation types (intrinsic motivation, extrinsic motivation and amotivation) and physical education importance (PEI). **Main findings.** The results showed that PEI was positively related to autonomy, competence, relatedness and self-determined motivation. Amotivation was negatively associated with PEI. **Conclusions.** The satisfaction of the three basic psychological needs and self-determined motivation develop a more positive attitude of the students towards physical education. The results are discussed with regard to enhancing participation rates and, potentially, physical activity levels.

Key words: physical education, motivation, self-determination

Introduction

Different studies have shown the impact that teachers' actions have on pupils' attitudes in physical education classes. Some aspects such as interest, satisfaction, the level of pupil's involvement in the class and motivation are variables that are influenced by the pupil's perception of the motivational climate generated by the teacher, with results demonstrating, among others, that environments favouring the pupils' autonomy and decision-making lead to greater satisfaction and interest in physical education [1–3].

Taking into account the postulates of the self-determination theory [4, 5], it is interesting to analyse pupils' perceptions of their autonomy, competence and relatedness, since they will have an influence on their motivation towards physical education and probably on how important and useful they think the subject is. According to this theory, self-determined behaviour can be described by distinct motivational types: (a) amotivation,

a lack of motivation; (b) extrinsic motivation, or engaging for reasons that emanate from the outside of the self, such as rewards or coercion; and (c) intrinsic motivation, or engaging for reasons that emanate from within the self or within the activity itself. These motivational types can be ordered along a continuum on which amotivation and intrinsic motivation are at opposite ends. Movement along the continuum is partly governed by internalising motives for participating, so that those that were formerly extrinsic become intrinsic. In this shift along the continuum, it is suggested that one crosses a threshold of autonomy [6].

There are different types of regulation within extrinsic motivation depending on the level of self-determination: external, introjected, identified and integrated. In external regulation, students participate in class to attain external incentives, in introjected regulation, participation is determined by feelings of guilt, whilst in identified regulation, they participate because they think the activity is important, although it is not actually pleasurable. In integrated regulation, performing an activity is in congruence with the individual's different

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values, thoughts and ideas, although this type of motivation does not usually occur in adolescents [7]. Vallerand and collaborators [e.g. 8] also established the existence of three forms of intrinsic motivation: intrinsic motivation to know (participating actively in the class to enjoy learning things), intrinsic motivation to accomplish (participating to enjoy by improving skills) and intrinsic motivation to experience stimulation (participating to enjoy experiencing stimulating situations).

According to the self-determination theory, human behaviour is motivated by three primary and universal psychological needs: autonomy, competence and relatedness, which seem to be essential to facilitate optimum functioning of natural tendencies for growth and integration, as well as for social development and personal welfare [9, 10]. Students need to feel they have a certain freedom to act, that they can perform activities efficiently and relate positively with the people in their immediate environment. The three needs will influence motivation, to the extent that an increase in the perception of competence, autonomy and relatedness will create a type of intrinsic motivation, while frustrating these needs will be associated with less intrinsic motivation and more extrinsic motivation and amotivation [9]. The theory further proposes that as one's motivational state moves towards intrinsic motivation, increases in cognition (e.g. deeper understanding), behaviour (e.g. increased participation) and affect (e.g. attitude) will result. These postulates have been demonstrated in physical education classes by different research studies [e.g. 11–13]. High levels of intrinsic motivation in students are desirable because students will participate for reasons not limited to the influence of setting grades, the teacher, or forced participation. In other words, they are more likely to become physically active on their own.

As shown by the hierarchical model of intrinsic and extrinsic motivation and the different research conducted in this area [14], social factors have an important influence on the satisfaction of basic psychological needs and the development of self-determination. Furthermore, as mentioned above, the most self-determined motivation is linked with more positive consequences. Therefore, the climate created by physical education teachers can determine, to a large extent, whether their students feel competent, autonomous or integrated with their classmates. These feelings will lead them to participate in physical education for the enjoyment they obtain. Along these lines, it is interesting to analyse

how this greater self-determination influences the development of a positive attitude towards physical education such as to be able to guide teachers' interventions.

Physical education is an excellent setting for developing favourable attitudes towards physical activity and sport at a stage as critical as adolescence. The fact that pupils consider physical education important and find it useful for their future is one of teachers' main objectives. Making adolescents appreciate physical education and sport is to be the first step in fostering active lifestyles. Bearing this in mind, and taking the self-determination theory for reference, the aim of this study was to analyse how the fulfilment of basic psychological needs and motivation can influence the pupils' view on how important or useful physical education is. We hypothesised that meeting the three basic psychological needs and the most self-determined forms of motivation would be related to recognising the importance and usefulness of physical education.

Material and methods

Participants

Our study's sample comprised 440 students, aged between 14 and 16 ($M = 14.8$, $SD = .81$), of which 229 were male and 211 female students, all members of physical education classes in schools in a large Spanish city. A sample of students in their final years of compulsory secondary education was used because adherence to sport tends to decrease after this stage [15].

Instruments

Contextual Self-determination. A modified version of the Sport Motivation Scale (SMS) [8] in Spanish [16] was used to measure motivation in physical education at the contextual level. This scale is composed of four items for each factor and so it has a total of 28 items with the question stem of "I participate and try hard when practising in physical education ...". These items assess the constructs of amotivation, three types of extrinsic motivation (external, introjected and identified regulation) and three types of intrinsic motivation (to know, to accomplish, to experience stimulation). Students responded to 28 statements (four items on seven subscales) on a 7-point Likert scale where *does not describe me at all* – 1 and *describes me exactly* – 7. This scale is a contextual motivational measure, which as-

sesses the motivational dispositions of students towards physical education in general. Recent studies (see [17], for a review) confirmed the factor structure of the scale and demonstrated a satisfactory level of internal consistency, as well as adequate test – retest reliability. In this study, Cronbach’s alphas of the seven subscales ranged from .70 to .80. Subscales can be used separately or in combination to form a summary score called the self-determination index [18].

Psychological mediators. A modified version of The Basic Psychological Needs Scale in the work domain and the inter-personal relations domain was used to measure physical education. The Basic Need Satisfaction at Work Scale has been used most often [19, 20]. The original scale had 21 items concerning the three needs for competence (six items), autonomy (seven items) and relatedness (eight items). The version adapted to physical education [21] comprised three items for every one of the three factors: autonomy (e.g. “I express my ideas and opinions freely in the physical education class”), competence (e.g. “Most of the time I feel that I am talented at physical education”) and relatedness (e.g. “I get on well with my peers in physical education classes”), which were answered using a 7-point Likert scale where *totally disagree* – 1 and *totally agree* – 7. The internal consistency of the instrument and every one of the factors was obtained by calculating Cronbach’s alpha coefficient: autonomy (.64), competence (.67) and relatedness (.76).

Physical Education Importance (PEI). Three items were created in order to measure the importance and usefulness pupils give to physical education: “I believe it is important to receive physical education classes”, “Compared with the rest of the subjects, I think that physical education is one of the most important” and “I think that the things I learn in physical education will be useful in my life”. Students responded to three items on a 4-point Likert scale where *totally disagree* – 1 and *totally agree* – 4.

Procedures

Authorization to conduct the research was given by headteachers. The students were informed of the study’s purpose and of their rights as study participants and were asked to sign a consent form. The instruments for measuring the different variables were administered in a classroom to the chosen subjects when the teacher was not present. Each participant took 10-20 minutes to

complete the questionnaires and responses to the instrument were kept anonymous. The participants were told to ask for help if confused concerning either instructions or the clarity of particular items. No problems were encountered in completing either of the inventories or understanding the nature of the questions.

Data Analysis

First, we analysed the psychometric properties of the items created to measure how important the pupils think physical education is. Then we carried out a correlation analysis among the psychological mediators, motivation and the importance of physical education. Next an ANOVA was utilised to analyse the differences in the fulfilment of basic psychological needs and motivation based on how important the pupils rated physical education (low, medium or high). Finally, a regression analysis was undertaken in order to find out the prediction power of the psychological mediators on self-determined motivation and how important and useful the pupils think physical education is.

Results

Psychometric Properties of the Physical Education Importance

We carried out a factor analysis of principal components (see Tab. 1) in order to examine the factorial structure of the items. We then did a factor analysis of principal components with varimax rotation resulting from the analysis grouped into one factor (Physical Education Importance) with an eigenvalue of 2.01 and explaining a total variance of 67.15%. Cronbach’s alpha reliability coefficient was .75.

Table 1. Psychometric properties of the Physical Education Importance

Items	Factor
1. I think it is important to receive physical education classes	.827
2. Compared with the rest of the subjects, I think that physical education is one of the most important	.814
3. I think the things I learn in physical education will be useful in my life	.818
	Reliability
	.75
	Explained variance
	67.15%

Means, Standard Deviation and Correlation Analysis

Tab. 2 shows that autonomy, competence and relatedness were related positively and significantly to all the variables except amotivation, which was related negatively. With respect to the PEI variable, there were positive and significant relations with all the variables, except amotivation, for which the relation was negative.

ANOVA

The dependent variables were the seven motivation factors (MI to know, MI to experience stimulation, MI to accomplish, identified regulation, introjected regulation, external regulation and amotivation) and the three psychological mediators (autonomy, competence and relatedness), and the independent variable was the PEI, which was recoded on three levels (not much importance: 1–1.99, average importance: 2–2.99 and a lot of importance: 3–4).

As observed in Tab. 3, significant differences are obtained in all the variables. In the three MI factors, the three ME factors and the autonomy, competence and relatedness factors, motivation increases when there is more PEI. As far as amotivation is concerned ($F = 5.98, p < .05$), it increases as PEI is less. In the *a posteriori* analysis test (Tukey's test), there were differences ($p < .01$) in all the variables and the differences in the amotivation variable were distinct ($p < .05$).

Hierarchical Multiple Regression

Two multiple regression analyses were conducted to examine how psychological mediators affect self-determination (SDI) and PEI (see Tab. 4). The SDI (Self-determination Index) was calculated using the scores of seven SMS subscales and the following formula: $(2 \times (\text{IM to Know} + \text{IM to Accomplish} + \text{IM to Experience Stimulation})/3 + \text{Identified Regulation}) - ((\text{Introjected Regulation} + \text{External Regulation})/2 + 2 \times \text{Amotivation})$ [18]. As Chantal, Vallerand, and Vallières [22] state, the justification for this type of computation is based on Guttman's [23] simplex structure patterns, such as the correlation matrix that emerges from the self-determination continuum. This type of matrix is characterised by strong positive correlations between subscales on the self-determination continuum and weaker correlations between subscales located at opposite ends. This type of index has been shown to be

Table 2. Means, standard deviation, alpha coefficient and correlations for all the variables

	M	SD	α	1	2	3	4	5	6	7	8	9	10	11
1. MI to know	5.17	1.44	.80	—	.78**	.75**	.72**	.73**	.49**	-.18**	.57**	.44**	.47**	.50**
2. MI to experience stimulation	5.09	1.35	.76	—	—	.77**	.78**	.73**	.57**	-.11*	.56**	.50**	.51**	.52**
3. MI to accomplish	5.29	1.33	.79	—	—	—	.74**	.73**	.51**	-.17**	.49**	.44**	.51**	.50**
4. ME Identified regulation	5.08	1.38	.78	—	—	—	—	.70**	.64**	-.04	.52**	.48**	.55**	.53**
5. ME Introjected regulation	5.19	1.27	.70	—	—	—	—	—	.53**	-.06	.51**	.43**	.46**	.47**
6. ME External regulation	4.44	1.42	.73	—	—	—	—	—	—	.18**	.36**	.44**	.35**	.37**
7. Amotivation	3.31	1.56	.70	—	—	—	—	—	—	—	-.13**	-.13**	-.13**	-.15**
8. Autonomy	4.90	1.40	.64	—	—	—	—	—	—	—	—	.45**	.47**	.40**
9. Competence	4.40	1.56	.67	—	—	—	—	—	—	—	—	—	.36**	.37**
10. Relatedness	5.67	1.28	.76	—	—	—	—	—	—	—	—	—	—	.38**
11. Physical Education Importance	3.02	0.74	.75	—	—	—	—	—	—	—	—	—	—	—

* $p < .05$, ** $p < .01$

Table 3. ANOVA by PEI

	Low PEI (<i>n</i> = 63)		Middle PEI (<i>n</i> = 156)		High PEI (<i>n</i> = 221)		Mean square	F	<i>p</i>
	M	SD	M	SD	M	SD			
MI to know	3.73	1.67	4.96	1.26	5.72	1.15	101.71	62.32	.000
MI to experience stimulation	3.63	1.56	4.87	1.15	5.66	1.03	106.91	78.64	.000
MI to accomplish	3.93	1.62	5.10	1.12	5.81	1.03	90.61	66.48	.000
ME Identified regulation	3.67	1.60	4.78	1.14	5.69	1.07	110.77	78.14	.000
ME Introjected regulation	4.01	1.62	5.03	1.13	5.65	.98	69.08	52.32	.000
ME External regulation	3.40	1.59	4.26	1.27	4.86	1.29	56.61	31.75	.000
Amotivation	3.75	1.42	3.48	1.44	3.08	1.64	14.29	5.98	.003
Autonomy	3.82	1.59	4.73	1.20	5.33	1.28	59.94	35.14	.000
Competence	3.18	1.57	4.23	1.32	4.88	1.50	74.53	35.34	.000
Relatedness	4.69	1.61	5.50	1.19	6.02	1.03	49.88	35.13	.000

Table 4. Summary of the multiple regression analysis for variables predicting importance and self-determination behaviour by mediators

	B	SEB	β	Adj. R^2
Physical Education Importance	1.35	.15		.23*
Autonomy	.11	.02	.21*	
Competence	.09	.02	.20*	
Relatedness	.12	.02	.21*	
Self-determined motivation	-7.30	.98		.26*
Autonomy	.86	.17	.24*	
Competence	.48	.14	.15*	
Relatedness	.93	.18	.24*	

* $p < .001$

a valid indicator of self-determination in studies on motivational issues [e.g. 24, 25]. The SDI provided a manipulation check [8, 26]. Possible total scores on the SDI range from -21 to +21. Scores in the present study ranged from -9.42 to +17.33 ($M = 4.37$, $SD = 4.89$). The internal consistency of the index was satisfactory (Cronbach's $\alpha = .89$). In the regression analyses, the three factors (autonomy, competence and relatedness) predict PEI and self-determination by 23% and 26%, respectively, finding significant differences ($p < .001$) in them.

Discussion

This study has established connections between the self-determination theory and the importance students place on physical education. The results revealed that the fulfilment of the basic psychological needs of autonomy, competence and relatedness, intrinsic motiva-

tion and extrinsic motivation correlated positively with the physical education importance. The correlation was stronger with more self-determined forms of motivation. Furthermore, amotivation was connected negatively with the importance placed on physical education. It would appear that students feel physical education is more important as the teacher increases their perceptions of autonomy, competence and relatedness, giving rise to more self-determined motivation. In fact, the regression analysis showed the positive influence of the fulfilment of the three needs on self-determined motivation and the importance and usefulness students place on physical education classes.

In line with the postulates of the self-determination theory, this study shows that teachers need to encourage students to participate in class, to reach the objectives set and integrate in the group. This will result in students having a more positive motivation so that they will view the subject as something important and feel that they could use the knowledge acquired in their everyday lives. Previous studies showed that meeting basic psychological needs and self-determined motivation were connected with other similar positive consequences in physical education, such as effort and persistence [27, 28], satisfaction and task involvement [29], the intention to be physically active [11, 13], concentration, positive affect and the search for challenges [12, 30].

Managing to get pupils to value physical education more highly and to develop a more favourable attitude towards it could be a great help in increasing the probability of them doing physical activity and sport throughout their lives. We have to bear in mind that attitudes towards sport formed in adolescence may well have a great deal of influence at later stages of life [31]. This means that physical education is an ideal medium for

fostering active lifestyles. This study has shown that pupils' basic psychological needs have to be met and their self-determined motivation cultivated in order to achieve a more positive attitude towards physical education. Therefore, creating autonomy-supportive activities and programmes for adolescents may be especially effective [26, 32]. In this regard, to make students feel competent, it would be interesting for physical education teachers to provide positive feedback, making them aware that their skill can always be improved with hard work and effort, to promote process-oriented goals (which are easier to attain), and to establish moderately difficult objectives. To promote this feeling of autonomy, teachers can allow students to choose from among different activities resulting in the same objective, encourage their students to participate in the process, make their opinion matter and motivate them to design exercise programmes and creative body compositions. Similarly, every activity's objective must always be explained so that students understand why it is important and do not feel that something is being imposed on them without any justification whatsoever. Teachers should also try to encourage interaction among the students, designing cooperative, reflective and group-building activities, with multiple and heterogeneous forms of grouping. It is important to treat all the students the same and not to establish normative comparison criteria in the assessment. If these guidelines are followed, then students' basic psychological needs would most likely be satisfied, their self-determination would increase [33], and, as this study demonstrates, this can have a positive influence on their appraisal of physical education. This could be a first step towards creating positive attitudes that encourage adherence to exercise.

The results call for the promotion of self-determined motivation in physical education to enhance participation rates and, potentially, physical activity levels. As shown by the hierarchical model of intrinsic and extrinsic motivation [14], physical education teachers (social factor) can influence students' self-determination by means of psychological mediators (autonomy, competence and relatedness). This motivation could have a positive effect on their attitude towards physical education and sport, encouraging a commitment to sport. The main limitation of this study is the use of a correlational design that does not allow cause and effect relations to be established. Nevertheless, it provides relevant descriptive information that may be a starting point in

designing experimental studies that analyse how teachers can get students to recognise the importance and usefulness of physical education classes. Furthermore, it would be interesting to develop new theoretical models explaining self-determination and its consequences using the structural equation technique. Future investigations should be focused on the self-determination theory in the field of physical/sport activity, since this progress will help to discover more details about the most important variables en route to promoting physical/sport activity. In the light of the importance of motivated behaviour in human activities, the study of the determinants of motivation should be given high consideration in future research.

Conclusions

The satisfaction of the three basic psychological needs (autonomy, competence and relatedness) and self-determined motivation are related to a more positive attitude of the students towards physical education. These results could be of great help in enhancing participation rates and, potentially, physical activity levels.

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