

Assessment of Motivation in Spanish Physical Education Students: Applying Achievement Goals and Self-Determination Theories

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Abstract: The purpose of this study was to identify the different motivational profiles and the existence of differences in perceived competence and physical condition among a sample of 736 students. Different instruments were applied in order to assess sport motivation (SMS), motivational orientation (POSQ), perceived competence and physical condition. Cluster analysis showed four motivational profiles (highly motivated; non-self-determined; moderated self-determined; amotivated). Perceived competence and physical condition manifested significant differences in the four clusters. There were gender and after school sport practice differences in the four clusters too. These results enable physical education teachers to implement segmentation strategies in order to increase the effectiveness of their interventions and achieve more active participation.

Keywords: Self-determination, motivational profiles, achievement goal, perceived competence, physical condition.

INTRODUCTION

Research has highlighted that adolescence is a development phase characterised by a high number of physical and psychological changes [1, 2]. Physical self-concept is considered to be a good indicator of the subject's mental and social adjustment in this stage [3-5]. The subject's motivation can direct and regulate his/her perceptions and behaviour and, in this respect, it is a key factor in facilitating the students' experiences of achievement [6]. Research has shown that there is a decrease in the students' motivation to take part in physical education activities [7] and a decrease in the level of perceived competence [8], as they progress through the school and perceive more academic demands. Given the decrease in the level of physical self-perception and motivation that occurs in the first years of adolescence, it is important to understand the motivational process students are wrapped up in at these ages and their effects on their physical self-perceptions. Achievement Goals and Self-determination Theories [9-17] were used in this study to understand how student's motivation might be associated with physical self-concept in adolescent.

Motivation in the physical education context is basically derived from the level of autonomy one has to choose tasks, as well as the perception of competence [18-20]. In this respect, the Self-determination Theory [15, 17] is particularly useful due to the role autonomy and the perception of competence play in motivating human behaviour. Self-determination Theory has been applied in a variety of contexts, in both education [21] and sport [22] to explain how individuals can have different types of motivated behaviour: intrinsically motivated, extrinsically motivated or amoti-

vated. Intrinsic motivation (to know, to accomplish and to experience stimulation) reflects situations, in which individuals do an activity to have fun, learn new things or develop their skills. On the other hand, extrinsic motivation (identified, introjected and externally regulated) describes situations in which individuals do an activity as a means to achieve certain desirable results. On the contrary, individuals can also feel a lack of motivation towards an activity. This state is called amotivation. According to Coakley & White [23], this state occurs in students that do not value the activity, or when they believe that they cannot attain a desirable result. They then feel bored and incompetent and think that the lesson is a waste of their time.

If we use social psychology research on the effect that the behaviour of other people has on our thoughts, feelings and behaviour in the motivational field of both education and sport, we discover that there are some social factors that influence people's motivation because of their impact on their perceptions of competence, autonomy and social relations [15, 16] and they predict affective, cognitive and behavioral consequences. When this model is applied to the PE context, the determining social factors of motivation are formed by the environment and the emphasis placed on performing well in the learning process or in the results. The former leads to a task-involving state and predicts self-determined motivation positively [24]. The latter helps an ego-involving state to appear and it is a negative predictor of self-determined motivation in PE students [25].

This can be seen in the study by Ferrer-Caja & Weiss [18]. They use a structural equation model to demonstrate that perceived competence and self-determination are predicted by task orientation and by the learning climate and in turn they predict intrinsic motivation. The correlational analysis performed by Zahariadis & Biddle [26] with adolescent's shows a clear relation between task orientation and

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intrinsic motivation, whilst ego orientation was associated with extrinsic motivation.

Standage & Treasure [27] corroborated the important role played by task orientation in self-determination in their research. Task orientation predicted high levels of self-determined motivation and low amotivation. In addition, self-determined motivation predicted a high intention to be active and to do physical activity, whilst amotivation predicted low levels in the intention to be active and in doing physical activity. In contrast to these results, Kim & Gill [28], with a sample of Korean adolescent sportspeople, found that both task orientation and ego orientation were related positively with intrinsic motivation.

Furthermore, the usefulness of perceived competence as a predictor of behaviour in physical activity has been proved [29, 4]. Other studies [18, 30-32] show the predictive value of perceived competence in intrinsic motivation in PE lessons.

In this respect, Amorose [33] supports the positive impact of physical self-concept and the perception of competence in motivation towards exercise in the PE context. Georgiadis *et al.* [34] relate goal orientations, self-determination and physical self-evaluation globally using the structural equation model (path analysis). Worth highlighting among their results is that physical self-evaluation is predicted positively by the more self-determined types of motivation (intrinsic motivation and identified regulation), while introjected regulation does this to a lesser extent, and predicted negatively by external regulation. Boyd, Weinmann, & Yin [35] used a correlational analysis to show that physical condition is the factor that most strongly explains intrinsic motivation. McNeill and Wang [36] examined motivational profiles in young people between the ages of 14 and 15 years who practiced or did not practice sport. Recently, Moreno, Llamas, & Ruiz [37] identified three clusters in a sample of adolescent students. The first was one denominated "self-determined profile" because students manifest a high self-determined motivation; the second profile was named "non self-determined profile" showing low levels of intrinsic and extrinsic motivation. Finally, the third profile was denominated "moderate motivation profile" with intermediate results on intrinsic and extrinsic motivation and high amotivation.

Wang, Chatzisarantis, Spray, & Biddle [38] looked for the possible relations established between goal orientation, self-determination and perceived competence using a cluster analysis. They established three motivational profiles, "lowly motivated", with low scores in ego orientation and perceived competence, "highly motivated" with high scores in the three variables and "moderately motivated" with moderate task orientation, low ego orientation and moderately low perceived competence. The "highly motivated" group had significantly higher scores in self-determined motivation types and lower scores in the non-self-determined motivation than the "lowly motivated" group. In addition, the latter showed less self-determined motivation and more amotivation than the "moderately motivated" group. Wang & Biddle [39] use the cluster analysis to identify motivational profiles in physical activity in a group of adolescents. Of the five profiles they obtain, the most self-determined have the highest scores in global physical self-evaluation and perception of compe-

tence. Along the same lines, Ntoumanis [40] identified three profiles in a group of PE students. The most self-determined profile was characterised by high scores in self-determined motivation (intrinsic motivation, identified regulation), affective consequences (effort, satisfaction) and task-involving motivational climate (learning in collaboration). On the other hand, boredom and evaluation based on comparison with others have low scores.

In view of the results obtained in the work reviewed and bearing in mind the importance of physical education in students' education, the essential objective of this study is to identify motivational profiles in PE, taking into account the influence of dispositional orientation and self-determined motivation, as well as checking the predictive nature of perceived competence and physical education in the self-determination level in each one of the profiles. The second objective of this study is to identify the differences in each of the profiles according to gender and physical/sport activity outside school hours.

Prior studies in other countries have highlighted the need to analyse the effect of the perception of competence in motivational responses, for example self-determination [41]. Therefore, and pursuant to some prior studies [38-40, 42, 43], we hypothesize that the most self-determined profiles in achievement contexts in physical education will have higher scores in task orientation than in ego orientation, self-determined motivation types, perceived competence and physical condition, and low scores in non-self-determined motivation and amotivation. The least self-determined profiles will have low scores in ego and task orientation, perceived competence and physical condition, and high scores in amotivation.

METHOD

Participants and Procedure

The sample consisted of 736 PE students (M age = 15.5, $SD = 1.11$) of both genders (370 male and 366 female) at state secondary schools and colleges in the Region of Murcia, Spain. 28.1% ($n = 207$) of the subjects stated that they did not do any sport outside school hours, whilst 71.9% ($n = 529$) stated that they did do sport.

Authorisation to do the research was given by the students' parents or tutors, the PE department and the head teachers of the educational centres.

The students were informed of the study's purpose, asked to collaborate in the project and they were told that their answers were anonymous. The instruments for measuring the different variables were administered in a classroom with only the main researcher present. They were asked not to start until the instructions had been explained and any possible questions had been answered. Each participant took between 15 and 20 minutes to complete the questionnaires. As they finished, the researcher collected the questionnaires individually and thanked them for volunteering. No significant problems were encountered.

Measures

Sport Motivation Scale (SMS). The Sport Motivation Scale [44], translated and adapted to Spanish by Núñez, Martín-Albo, Navarro, & González [45], was used to meas-

ure the students' participation and effort in the PE lesson. This scale is formed by 28 items grouped into seven factors: intrinsic motivation (to know, to experience stimulation and to accomplish), extrinsic motivation (identified, introjected and externally regulated) and amotivation. The replies to the different items were rated on a Likert-type scale with a response range between 1 and 7, where 1 is totally disagree and 7 is totally agree. The Cronbach alpha values of the questionnaire fluctuate between .67 and .77.

Perception of Success Questionnaire (POSQ). The Spanish version [46, 47] of the Perception of Success Questionnaire [48] was used to measure the goal orientations of young participants in PE lessons. The questionnaire is formed by 12 items. Six of them correspond to the student's "task orientation" factor (e.g. "I feel I am successful in the PE lesson if I work hard") and the other six correspond to the student's "ego orientation" factor (e.g. "I feel I am successful in the PE lesson if I beat the others"). The replies to this questionnaire were closed and they were presented on a Likert-type scale that fluctuated between 1, a value corresponding to totally disagree, and 5, a value that corresponded to totally agree with the suggestion. The internal consistency was .84 for task orientation and .92 for ego orientation.

Perceived Competence. This is one of the five factors forming the scale that measures physical self-perception (PSPP) by Fox & Corbin [49], validated for the Spanish context by Moreno & Cervelló [38]. It is formed by six items (e.g. "I am good at nearly all sports"). The replies, which are closed, cover a range from 1, totally disagree, to 4, totally agree. The Cronbach alpha coefficient obtained was .80.

Perception of Physical Condition. This is one of the five factors forming the scale that measures physical self-perception (PSPP) by Fox & Corbin [49], validated for the Spanish context by Moreno & Cervelló [50]. It is formed by six items (e.g. "I always keep myself in excellent condition and physical shape"). These refer to the perception the subject has of his/her capacity to deal with and solve aspects related to participation in physical activity and sport. The closed response ranges from 1 for totally disagree to 4 for totally agree, obtaining an internal consistency of .76.

Data Analysis

A descriptive analysis and a correlational analysis between the variables being studied were carried out. In order to identify the different motivational profiles in PE students, a cluster analysis was performed using goal orientations and the seven self-determined motivation variables. The perception of competence and the perception of physical condition were not included, although they were used later as dependent variables to check the possible differences in the clusters [51]. This meant that we were able to make a clearer identification of the motivational profiles, as previous similar work had demonstrated [39, 43].

In order to check possible gender and outside-school physical activity/sport differences in the clusters, Pearson's Chi-square test was used, rounded off with a standard residual analysis.

RESULTS

Descriptive and Correlational Data of all the Factors

Table 1 shows the descriptive analyses of the different instruments used in this research, as well as the reliability coefficients and the correlations analysed among the variables in the study.

The means of the factors forming goal orientation fluctuated between $M = 2.95$ for ego orientation and $M = 4.28$ for task orientation. Self-determined motivation showed mean values for intrinsic motivation to know of 4.64; for intrinsic motivation to experience stimulation they were 4.51; for intrinsic motivation to accomplish they were 4.65, for identified extrinsic motivation they were 4.36 and for introjected extrinsic motivation they were 4.73.

The lowest means were found in externally regulated extrinsic motivation ($M = 3.51$) and amotivation ($M = 2.73$). With regards to the perception of physical condition, the mean was 2.68 and in perceived competence it was 2.47.

Ego orientation was related positively and significantly with intrinsic motivation (to experience stimulation and to accomplish), with extrinsic motivation (identified, intro-

Table 1. Means, SD, Cronbach's Alpha and Correlations of All Variables

	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7	8	9	10	11
1. Ego orientation	2.95	1.18	.92	-	.22**	-.030	.11**	.14**	.11**	.07*	.50**	.12**	-.11**	.25**
2. Task orientation	4.28	.67	.84	-	-	.41**	.37**	.48**	.33**	.40**	.08*	-.15**	.21**	-.004
3. IM to know	4.64	1.33	.77	-	-	-	.60**	.56**	.24**	-.08*	.00	.21**	.25**	.01
4. IM to experience stimulation	4.51	1.26	.76	-	-	-	-	.62**	.34**	-.10**	.05	.33**	.33**	.13**
5. IM to accomplish	4.65	1.13	.75	-	-	-	-	-	.33**	-.10**	-.00	.31**	.29**	.09**
6. EM identified regulation	4.36	1.20	.70	-	-	-	-	-	-	-.04	.05	.33**	.33**	.06
7. EM introjected regulation	4.73	1.15	.67	-	-	-	-	-	-	-	-.09*	.23**	.21**	.05
8. EM external regulation	3.51	1.35	.75	-	-	-	-	-	-	-	-	.42**	.33**	.13**
9. Amotivation	2.73	1.28	.70	-	-	-	-	-	-	-	-	-	-.29**	-.29**
10. Perceived competence	2.47	.67	.80	-	-	-	-	-	-	-	-	-	-	.51**
11. Perceived physical condition	2.68	.62	.76	-	-	-	-	-	-	-	-	-	-	-

* $p < .01$; ** $p < .001$.

jected and external) and amotivation. It is also related positively and significantly with physical condition and negatively with perceived competence. Task orientation is related positively and significantly with intrinsic motivation (to know, to experience stimulation and to accomplish), extrinsic motivation (identified, introjected and external) and with perceived competence. It is related negatively with amotivation. Perceived competence is related positively and significantly with all kinds of intrinsic and extrinsic motivation and negatively with amotivation. Physical condition is related positively and significantly with intrinsic motivation (to experience stimulation and to accomplish) and externally regulated motivation. It is related negatively with amotivation.

Analysis of the Motivational Profiles

The cluster analysis phases were in line with the procedure designed by Hair *et al.* [51]. First, the cases with missing data in any of the nine variables were excluded. Second, all the variables were standardised using Z scores. In our case this was necessary because the Perception of Success Questionnaire (POSQ) uses a scale between 1 and 5, the Sport Motivation Scale (SMS) uses a scale between 1 and 7 and perceived competence and physical condition are measured on a scale ranging from 1 to 4. Next, the subjects were grouped into clusters using the Ward method, a hierarchised procedure that minimises the distance between the subjects in the cluster (it decreases the variance within the group) and prevents long chains from forming [52]. Its dendrogram suggested the existence of four clusters as the most suitable solution. Z scores, with values between ± 0.5 and above, were used as a criterion to determine whether the group was con-

sidered “high” or “low” compared with the others. Fig. (1) shows the four motivational profiles.

Cluster 1. We could call it “highly motivated”. It is formed by 128 students (17.4%). Positive Z scores are higher in ego orientation and task orientation. The former are slightly higher than the latter. Those for intrinsic motivation (to know, to experience stimulation and to accomplish) and extrinsic motivation (identified and introjected) were also high compared with the other clusters. In contrast, amotivation obtained the lowest value in connection with the other clusters, except cluster 3.

Cluster 2. It was called “non-self-determined” and it was formed by 276 students (37.5%) who scored high in ego orientation, externally regulated extrinsic motivation and amotivation. In contrast, task orientation, intrinsic motivation (to know, to experience stimulation and to accomplish) and introjected extrinsic motivation had lower values in relation to the other groups, except cluster 4.

Cluster 3. Called “moderated self-determined”, it was formed by 233 students (31.7%) who scored high in task orientation, intrinsic motivation (to know, to experience stimulation and to accomplish) and identified and introjected extrinsic motivation. They had negative Z scores in ego orientation, externally regulated extrinsic motivation and amotivation.

Cluster 4. Defined as “amotivated”, it was formed of 99 students (13.5%). This group had the highest negative Z scores in all the variables except in amotivation, in which there were positive scores.

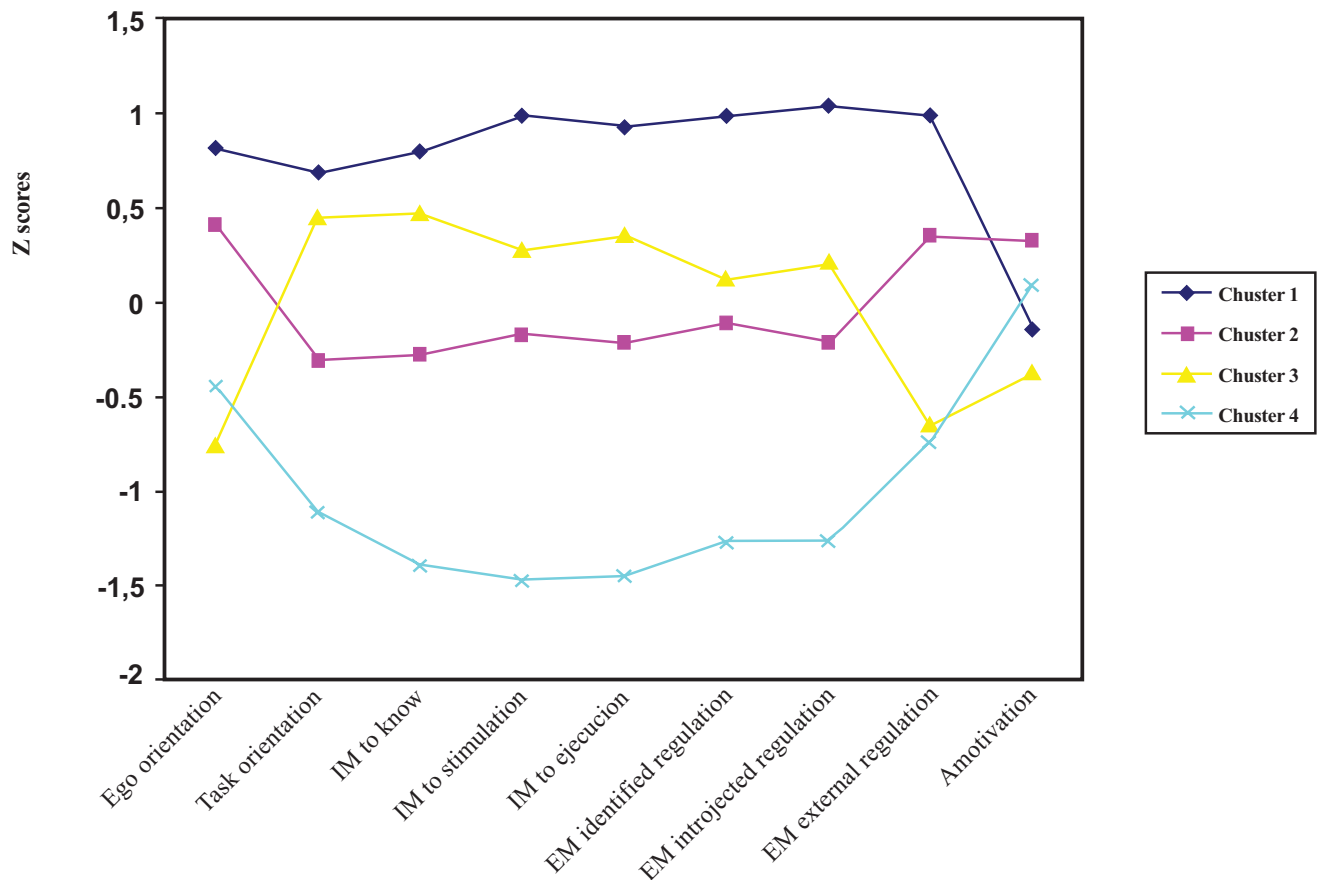


Fig. (1). Motivational Profiles in Physical Education.

Table 2. Means, SD and Z Scores by Cluster and Differences According to Gender and Sport/Physical Activity Outside School Hours

Variables	Cluster 1 (n = 128)			Cluster 2 (n = 276)			Cluster 3 (n = 233)			Cluster 4 (n = 99)		
	M	SD	Z	M	SD	Z	M	SD	Z	M	SD	Z
Ego orientation	3.92	.73	.82	3.44	.95	.41	2.06	.81	-.75	2.43	1.25	-.44
Task orientation	4.75	.26	.69	4.06	.64	-.31	4.59	.40	.46	3.53	.74	-1.11
IM to know	5.72	.78	.80	4.26	.02	-.28	5.29	1.03	.47	2.78	.85	-1.39
IM to experience stimulation	5.78	.78	.99	4.29	.78	-.17	4.88	1.08	.28	2.64	.81	-1.47
IM to accomplish	5.71	.72	.93	4.40	.70	-.21	5.06	.99	.36	2.99	.65	-1.45
Identified EM	5.56	.88	.99	4.21	.79	-.11	4.51	1.15	.13	2.83	.76	-1.27
Introjected EM	5.94	.65	.04	4.48	.81	-.21	4.99	1.00	.22	3.26	.92	-1.26
External EM	4.85	.99	.99	3.99	.99	.35	2.63	1.10	-.64	2.50	.97	-.74
Amotivation	2.55	.36	.14	3.17	.26	.33	2.27	1.04	-.36	2.85	1.29	.09
Gender Cluster	n	%	R	n	%	R	n	%	R	n	%	R
Boys	88	8.8	.6	164	9.4	.8	78	33.5	-6.2	40	40.4	-2.1
Girls	40	31.3	4.6	112	40.6	-3.8	155	66.5	6.2	59	59.6	2.1
Sport/Physical Activity Cluster	n	%	R	n	%	R	n	%	R	n	%	R
No sport/physical activity	16	12.5	-4.3	74	26.8	-.6	67	28.8	.3	50	50.5	5.3
Does sport/physical activity	112	87.5	4.3	202	73.2	.6	166	71.2	-.3	49	49.5	-5.3

The results showed significant differences (Wilks' Lambda = .81, $F(6,1460) = 26.30, p < .001$) in both perceived competence ($F = 51.26, p < .001$) and in perceived physical condition ($F = 30.56, p < .001$). After Tukey's post hoc test there were differences ($p < .001$) between all the groups, except between cluster 2 and 3 in the perception of physical condition variable. Cluster 1 demonstrated the highest values of perceived competence ($M = 2.97$) and perceived physical condition ($M = 3.05$). In cluster 2, the value of perceived competence was 2.51 and that of perceived physical condition was 2.68. In cluster 3, perceived competence ($M = 2.33$) and perceived physical condition ($M = 2.65$) had lower scores than in the previous cluster. In cluster 4, perceived competence ($M = 2.01$) and perceived physical condition had the lowest values of the four clusters ($M = 2.30$).

Differences Between Clusters

In order to demonstrate the predictive validity of the clusters obtained, a multivariate analysis of variance (MANOVA) was carried out, in which the perception of competence and the perception of physical condition were considered as dependent variables and the clusters as the independent variables (Table 3).

Gender and Outside-School Physical Activity/Sport Associations for Clusters

Pearson's Chi-square tests rounded off with the residual analysis showed that there were significant associations ($p < .001$) by gender and outside-school physical activity/sport in each of the clusters (Table 2). Clusters 1 and 2 were associated with the boys (68.8% and 59.4%, respectively). In contrast, clusters 3 and 4 were associated with the girls (66.5% and 59.6%, respectively). With regards to outside-school physical activity/sport, the participants that exercised (87.5%) were associated with cluster 1, whilst those that did not exercise (50.5%) were associated with cluster 4.

DISCUSSION

The main objective of this study was to identify the number and structure of the different motivational profiles in a sample of PE students, by analysing achievement goal orientation and self-determined motivation. We also examined the relation between the perception of competence and perceived physical condition with the level of self-determination of each of the profiles. The possible differences due to gender and outside-school physical activity/sport in the different profiles were also analysed. This approximation is extremely important in Physical Education, since profiles connected with the most negative consequences can be identified in order to implement strategies to increase the strength and quality of physical activity/sport motivation [53].

Four profiles resulted from the cluster analysis. In the first, the students had high scores in ego and task orientation and in self-determined and non-self-determined motivation. Taking into account the self-determination continuum stated by Deci & Ryan [16], we could think that students in this first cluster would have low levels in non-self-determined

Table 3. Means, SD, Z Scores by Cluster According to the Perception of Competence and Physical Condition

	Cluster 1 (n = 128)			Cluster 2 (n = 276)			Cluster 3 (n = 233)			Cluster 4 (n = 99)		
	M	SD	Z	M	SD	Z	M	SD	Z	M	SD	Z
Perception of competence	2.97	.58	.33	2.51	.61	.02	2.33	.60	-.09	2.01	.63	-.30
Physical condition	3.05	.58	.23	2.68	.56	1.29	2.65	.60	.86	2.30	.63	1.19

motivation. Nevertheless, our results demonstrate the contrary. In this respect, Vallerand & Fortier [43] observed two theoretical positions in the relation between intrinsic and extrinsic motivation. One is interactive and the other is additive. The former is explained by alternation in the two types of motivation. When one is high, the other is low. The second posture refers to the combination of intrinsic and extrinsic motivation and motivation increases at the highest levels. Vallerand & Fortier [43] and Pelletier *et al.* [44] propose this theoretical position at a contextual level (physical education and sport) and they consider that the relation between intrinsic motivation and non-self-determined forms of extrinsic motivation (introjected and external) is orthogonal or slightly negative. Other studies with a similar profile to the one obtained in our results can be found in the cluster analysis performed by Vlachopoulos *et al.* [53]. One of the profiles is characterised by high scores in both types of motivation (intrinsic and extrinsic). This group has the highest values of physical activity/sport outside school hours and perceived competence.

The second motivational profile could be considered as motivated externally in a moderate fashion. Almost all *Z* values were between 0 and -0.5. Nevertheless, the students had a slightly higher score in ego orientation, external motivation and amotivation. In addition, physical condition had the highest values of the four clusters. This profile type is usual among students that are involved in physical activity outside school hours, above all competitive sport, which often emphasises personal improvement results, giving rise to an ego-involved state, which means that participation in PE classes is fundamentally focused on demonstrating more competence than the others. We found a similarity with the results obtained by Wang & Biddle [39] in the cluster analysis performed with British school children between 12 and 15 years old to determine motivational profiles in physical activity. Specifically, in the fourth cluster of Wang & Biddle's study there was a positive relation between ego orientation, participation, global physical self-evaluation and perceived competence. There is also a certain similarity between our second cluster and the third profile of the four obtained by Matsumoto & Takenaka [42] with a sample of Japanese adults to determine changes in behaviour concerning intentions to do physical activity/sport. This profile had a high score in external motivation, which modifies intentions towards doing physical activity/sport regularly.

Our third motivational profile is a clear example of students that are self-determined in motivation. They had relatively high levels of intrinsic motivation, identified and introjected extrinsic motivation. In contrast, their levels in external motivation and amotivation were low. We might think that the students would report lower levels of introjected motivation. Nevertheless, as Vallerand [54] state, introjected motivation can occasionally have adaptable consequences in the physical education context.

Sometimes students get involved in class activities to avoid feeling guilty about disappointing their colleagues, their teacher, their parents, and so on. We also find positive relations with task orientation and physical condition in this profile. This result makes sense as long as the teachers promoting progress and personal improvement in the PE lesson increase self-determined motivation and improve perceptions

of competence [54]. Our findings would be in line with other studies that found positive relations between task orientation, self-determined motivation and physical self-concept [35, 38, 40].

Our fourth motivational profile had the lowest values of intrinsic motivation, identified regulation, introjected regulation and external regulation in comparison with the other clusters. In contrast, amotivation had a higher and positive score. We also find low ego and task orientation, as well as perceived competence. We can appreciate a similarity with the second profile in this study, except amotivation, which had higher values in the fourth one. It could be hypothesized that a low perception of competence will be the reason given students believe they lack personal skill. Consequently, they do not get sufficiently involved in the tasks; they think that it is not worth the effort, which generates a state of amotivation and weakens their intentions to do physical activity/sport until they finally stop exercising.

As far as the composition of the clusters is concerned, fortunately a higher number of students were found in the moderate or high motivational groups. Nevertheless, as in other studies, the results indicate that the group with fewer participants was the one that showed the lowest motivation and the highest amotivation [39, 40, 55]. Approximately 13, 45 % of the students in this study reported relatively low or very low levels of ego and task orientation and intrinsic and extrinsic motivation. This percentage should be worrying for the physical education context and the teachers and this group should be a focus of attention for the curriculum in classes.

Prior studies on motivational profiles have found that girls and physically inactive subjects are usually in the low motivation groups and in mastery-oriented clusters, whilst the boys and physically active subjects are usually over-represented in the high motivation groups [24, 36, 39]. The findings of this study are partially consistent with that research. A greater number of boys and physically active students were represented in the highly motivated cluster. Nevertheless, the representation percentage of girls and physically inactive students in the amotivated profile was not much higher than the boys'.

Results of this study suggest that it could foster a combination of motivational dispositions and thus facilitate a complementary balance among task and ego orientation and intrinsic and extrinsic motivation, as occurs in the highly motivated group. Nevertheless, the complex nature of interaction between different kinds of motivation may depend on physical activity settings. Therefore, research should also be carried out with different physical activity settings and with different students of different ages.

In short, from a theoretical viewpoint this study has identified different motivational profiles in physical education. Our findings show how different motivational types can appear in the same subject in a PE context, which means that teachers can be given an idea of the complexity of students' motivation. In practice, these results offer teachers the possibility of creating favourable conditions to combine different kind of motivation so that students perceive PE activities more interesting, fun and they can improve their personal goals. In this vein, physical education teachers could con-

sider the six dimensions (tasks, authority, recognition, grouping, evaluation and time) proposed by Epstein [11, 12] in order to modify the environment of physical education classes. The instructional strategies that include the TARGET structure have been described as effective in producing a positive change in the perception of physical competence [9, 56, 57].

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